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

# R E P O R T
# for biennial period, 1986-87
# PART II (1987)
# English version

MADRID, SPAIN 1988

# INTERNATIONAL COMMISSION FOR THE CONSERVATION OF ATLANTIC TUNAS

*Contracting Parties (as of April 1, 1988)*

Angola, Benin, Brazil, Canada, Cape Verde, Cuba, Equatorial Guinea, France, Gabon, Ghana, Côte d'Ivoire, Japan, Korea, Morocco, Portugal, Senegal, Sao Tomé & Principe, 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, 1988)*

| Panel | Contracting Parties | Chairman |
|---|---|---|
| 1 | Angola, Brazil, Cape Verde, Cuba, France, Gabon, Ghana, Côte d'Ivoire, Japan, Korea, Morocco, Portugal, Senegal, Spain, U.S.A., U.S.S.R. | Côte d'Ivoire |
| 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 1986-87 biennial period.

*Standing Committees*

| Standing Committees: | Chairman |
|---|---|
| Committee on Finance and Administration (STACFAD) | Ms. P. GARCÍA DOÑORO, Spain (from November 18, 1985) |
| Committee on Research and Statistics (SCRS) | Mr. A. GONZÁLEZ GARCÉS, Spain (from November 11, 1986) |

*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, 1986-87, Part II (1987)"***, describing the activities of the Commission during the second half of said biennial period.

The volume contains the reports of the Tenth Regular Meeting of the Commission, held in November, 1987, 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*

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CHAPTER III - National Reports

# CHAPTER I
# Secretariat Reports

**ADMINISTRATIVE REPORT 1987**
COM/87/9 (Amended)*

## 1. Member countries of the Commission

Since the last meeting of the Commission (November, 1986), Equatorial Guinea deposited with the Food and Agriculture Organization of the United Nations (FAO) an instrument of adherence to the Convention and became a Contracting Party of the International Commission for the Conservation of Atlantic Tunas. The Commission is currently comprised of twenty-three (23) member countries.

## 2. Ratification of the Protocol to the Convention

As of September 15, 1987, the FAO, depository of the ICCAT Convention, has informed the Commission that the countries on the following list have ratified the Protocol to the Convention, approved at the Conference of Plenipotentiaries (Paris, July, 1984), for accession of the EEC to the Convention.

| | |
|---|---|
| France | October 23, 1984 |
| São Tomé and Principe | November 1, 1984 |
| Korea | December 7, 1984 |
| South Africa | March 28, 1985 |
| Uruguay | May 10, 1985 |
| Japan | June 13, 1985 |
| Senegal | June 14, 1985 |
| Cape Verde | March 13, 1986 |
| U.S.S.R. | June 9, 1986 |
| U.S.A. | November 10, 1986 |
| Spain | November 21, 1986 |

## 3. Meetings organized by ICCAT

### 3.1 Working Group on Juvenile Multi-species Statistics

The meeting was proposed and approved at the 1986 Commission meeting. The SCRS Chairman, Mr. A. González-Garcés, nominated Mr. M. Mensah (Ghana)

*The Administrative Report presented at the Commission Meeting was revised.

as Convener of the Group. Due to technical difficulties, there was some delay in deciding on the meeting site. Finally it was decided that the meeting be held on June 1 through 5, 1987, at the "Centre de Recherches Océanographiques" (CRO), Dakar, Senegal, at the invitation of the laboratory.

The meeting was attended by scientists from France, Côte d'Ivoire, Portugal, São Tomé & Principe, Senegal, Spain and the U.S.A. The Secretariat was represented by Dr. P. M. Miyake and Mr. P. Kebe.

The major objective of the meeting was to review the historical catch statistics for the Gulf of Guinea surface fisheries, from the point of view of species composition. All the available data from various sources were compared by the Group and studied in detail. The Working Group's report has been distributed to the pertinent scientists and is available as SCRS/87/8.

### 3.2 Meeting of Team Leaders of Yellowfin Year Program

The Leaders of the four Activity Teams of the Yellowfin Year Program met in Dakar on June 3, taking advantage of their presence at the meeting of the Working Group of Juvenile Multi-species Statistics. All the activities were reviewed and future plans were slightly modified according to the current situation.

The Report of the Yellowfin Year Program is available as SCRS/87/7. The Team Leaders also met during the SCRS Session (Madrid, October, 1987) and reviewed the progress. Their report is found as Appendix 4 to the 1987 SCRS Report.

### 3.3 Swordfish Workshop

The Workshop was proposed and agreed upon at the 1986 Commission meeting. Mr. J. C. Rey (Spain) was nominated Convener. Although the Workshop was originally proposed as an intersessional meeting, due to the lack of time needed to prepare the data base, and in order to assure maximum participation of scientists, it was finally decided to hold the Workshop just prior to the 1987 SCRS meeting.

The meeting was held on October 6 through 13, 1987, in Madrid. The Report of the meeting is available as COM-SCRS/87/15. The Workshop made very good progress but could not complete the work due to a lack of time. The Workshop participants recommended that another intersessional meeting be held in 1988. The SCRS reiterated the recommendation and agreed to hold another session in June or July, 1988.

### 3.4 1987 SCRS Meeting

According to the decision of the Commission, for the first time the SCRS held its meeting this year well in advance of and at a different site from the Commission meeting, i.e., on October 14 through 22, 1987, at the Hotel Velázquez, Madrid, Spain. During the meeting, the Secretariat staff

remained at the Headquarters, so that all the typing, translation and reproduction of documents were done at the Headquarters, using our own equipment. This represented considerable savings in cost at a sacrifice of some convenience and time.

The SCRS Report is presented as COM/87/20. All the participants received a copy of the report adopted at the final session and a copy of the errata which showed any changes approved to the final draft. A few days later the unedited report was sent out to the Commissioners. The edited version is being printed in the Biennial Report.

## 4. Meetings at which ICCAT was represented

### 4.1 International Commission for the Southeast Atlantic Fisheries (ICSEAF)

ICCAT was represented by the Executive Secretary at the ICSEAF annual meeting held in Las Palmas, Gran Canaria, Spain, in December, 1986. He took advantage of the occasion to exchange impressions on the problems of ICCAT with several delegations from ICCAT member countries, in particular, Angola, Cuba, France, Portugal, and the U.S.S.R.

### 4.2 Coordinating Working Party on Atlantic Fishery Statistics (CWP)

The Thirteenth Session of the CWP was held on February 11-18, 1987, at FAO Headquarters in Rome. ICCAT, which is one of the principal members of the CWP, was represented by the Assistant Executive Secretary. The report of the meeting is available as SCRS/87/12. The focus of the meeting was on the usefulness of the STATLANT form to report statistics and how to eliminate the discrepancies in the data bases between agencies.

### 4.3 Semana Das Pescas, Azores

The Assistant Executive Secretary was invited to attend the "Semana das Pescas" at Horta, Azores, Portugal, on March 23-27, 1987. He prepared a paper on the overview of the world tuna fishery and market and the possibility of developing new tuna fisheries. Taking advantage of this trip, he visited and examined various possible meeting sites at São Miguel for the 1987 Commission meeting.

### 4.4 Ad-Hoc Consultation on Global Tuna Statistics

As reported at the 1986 Commission meeting, the second session was scheduled in Colombo in December, 1986. However, it was canceled due to difficulties in bringing together all the pertinent regional agencies. The second meeting was later rescheduled on May 21 and 22, 1987, at the NMFS Southwest Fisheries Center in La Jolla, California, U.S.A., immediately after the Lake Arrowhead Tuna Conference (May 17-20). All the international regional agencies concerned with tuna statistics attended the session, including IATTC, ICCAT, IPTP, SPC, FFA and FAO. ICCAT was represented by the Assistant Executive Secretary (P. M. Miyake) and the Convener of the Sub-Committee on Statistics (R. Conser).

The Group reviewed the progress made as well as the recommendations made at its first meeting. The Group reconfirmed its previous recommendations, i.e., improvement of world tuna statistics, development of a data base of world tuna fishing boats (individual boat names with specifications), collaboration between agencies for adopting common statistical systems, etc. Formalizing the mechanism of inter-agency consultation meetings was also recommended. The Group's Report is available as COM-SCRS/87/16.

### 4.5 Tuna Conference (Lake Arrowhead)

Taking advantage of the trip to California to attend the Inter-Agency Consultation on Global Tuna Statistics, the Assistant Executive Secretary attended the Tuna Conference held at Lake Arrowhead, California, on May 17-20. He presented a talk at the Conference on recent developments regarding world tuna, with particular emphasis on Atlantic tuna fisheries and research.

### 4.6 Tuna Stock Evaluation Meetings of the Indo-Pacific Tuna Program (IPTP)

A series of meetings on tuna stock evaluation was held at Colombo, Sri Lanka, in December, 1986. Originally, the SCRS recommended that the Assistant Executive Secretary attend the meeting since the Ad-Hoc Consultation of Global Tuna Statistics had been scheduled at the same time. However, as the latter meeting was canceled, his trip was also canceled. Dr. A. Fonteneau, who represented France, offered to represent ICCAT and this was authorized by the Executive Secretary.

## 5. Collaboration with other organizations

Collaboration with other organizations during 1987 has been very important. Many programs have begun and are under way.

### 5.1 CWP-Tuna

Of particular interest is the Ad Hoc Consultation on Global Tuna Statistics, which was proposed by Dr. Miyake and organized by FAO the first time at Colombo, in December, 1985; the second session was held at La Jolla, in May, 1987 (see 4.4). As recognized at the meeting, closer cooperation is developing among the tuna regional agencies, particularly in the technical field. ICCAT has taken the initiative in this collaboration.

### 5.2 Collaboration with FAO

Very close working cooperation has been maintained with the Fisheries Department of FAO and other FAO agencies, 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), and the Indian Ocean Fisheries Commission (IOFC).

Mutual collaboration between FAO and ICCAT in collecting statistics and other information continued as in other years. The project to eliminate discrepancies in Atlantic tuna statistics between the data bases of the two organizations was successfully continued and the FAO and ICCAT publications now have fewer discrepancies for Atlantic tunas.

The "Field Manual for Statistics and Sampling for the Indian Ocean", co-authored by Dr. P. Miyake, was finally published by FAO/UNDP IPTP and hopefully will contribute to the improvement of the statistical system in that region.

### 5.3 Other organizations

The Commission also collaborated with various international organizations other than those mentioned in the previous paragraphs, such as:

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)

Collaboration with those agencies as well as with FAO and other tuna regional agencies is not limited to scientific or technical fields but includes common administrative matters as well.

## 6. Coordination of Research

The coordination of research carried out by the Secretariat during 1987 is summarized in the "Secretariat Report on Statistics and Coordination of Research" (COM-SCRS/87/13). However, it should be emphasized that due to the current tight financial situation of the Commission, the activities were limited only to the minimum level required.

### 6.1 The Commission's in-house mini-computer

The Micro-Vax II computer delivered in June, 1986, has been functioning very well. The Secretariat transferred to magnetic tapes all the ICCAT data files from the INFONET system, which ceased operations in January, 1987. The reorganization and adaptation of these files into the ICCAT computer has been proceeding well and it is hoped that the transition will be finished by the end of 1987.

The computer is very powerful and efficient enough to handle all the data management required of the Secretariat but proved to be insufficient to facilitate the major analytical work which scientists may wish to carry out during their scientific sessions for more than one species.

Due to the increased cost for maintenance and shortage of funds, no new hardware or software have been added this year, though there are a few items on the waiting list (i.e., APL language recommended by SCRS, one monitor

working station, graphics software and possibly hardware, and an efficient laser printer). During the recent SCRS Meeting, scientists recognized that the major limitations are availability of disc space, number of terminals available for scientists and lack of APL language and good graphics. The SCRS scientists evaluated the needs and recommended the most economical ways to overcome their difficulties; this evaluation is reflected in the estimated budget for 1988.

### 6.2 Yellowfin Year Program

The Secretariat continues coordinating the Yellowfin Year Program. Details of the progress made in the Program are found in SCRS/87/7 and the SCRS Report (COM/87/20).

### 6.3 Program of Enhanced Research for Billfish

The Program was approved and budgeted at the last Commission Meeting and Dr. B. Brown (U.S.A.) was nominated Coordinator. The first draft Program Plan was developed by the Secretariat. ICCAT received $5,000 from the U.S. private sector, and later received a further $20,500, via the U.S. national office, as initial funding to conduct a feasibility study of the entire Program of Enhanced Research for Billfish. A Trust Fund was established for the Program and the $25,500 were deposited to that Fund.

Following a request from the Program Coordinator, and utilizing money from the aforementioned Trust Fund, Drs. E. Prince (U.S.A.) and P. Miyake (Secretariat) made a joint trip to Venezuela to conduct the feasibility study. As a result of that study, the first draft Program Plan was modified twice and was distributed in September. The Plan (COM-SCRS/87/14) was approved at the recent SCRS meeting and is presented to the Commission meeting. Parts of the Program, such as tagging, observers program and port sampling, have started in various areas. Details are reported in COM-SCRS/87/18 and Appendix 6 of the SCRS Report.

In addition, billfish tags and applicators were purchased from this Fund and are being stored for the Program.

## 7. Publications

The following publications have been issued so far in 1987:

-- Report for Biennial Period, 1986-87 (Part I), 1986 - (June)
Unlimited distribution.

-- Statistical Bulletin, Vol. 16 (Final) - (May)
This volume contains statistics up to 1985; unlimited distribution.

-- Statistical Bulletin, Vol. 17 (Preliminary) - (October)
This volume contains statistics up to 1986; distribution limited to scientists.

-- Collective Volume of Scientific Papers, Vol. XXVI (Nos. 1 & 2) - (April)
This volume contains 1986 SCRS papers; distribution is limited to the scientists directly involved in ICCAT work.

-- Data Record, Vol. 27 (July)
Distribution is limited to the scientists directly involved in ICCAT work.

-- Newsletter. Four issues were circulated in 1987.

In order to cut costs, all of these publications were done at the Secretariat except for binding. This year even the Biennial Report, which used to be page set by laser printer through contract, was page set and printed at the Headquarters. With this in mind, a laser printer was ordered in 1986 and was delivered in early 1987. However, the printer was unable to perform certain functions (proportional spacing and justified right-margin) as had been advertised. Consequently, the printer was rejected and the page setting had to be done using our normal daisy-wheel printers. Therefore, the quality of printing is not as good as in previous years.

A new simplified format has been adopted for summarizing data in the Data Record as approved at the last Commission meeting. This new format saves considerable time and expense in compiling tables, printing and mailing.

Also in order to save money, almost all the ICCAT publications have been shipped by surface mail, except for a few occasions when urgent distribution was essential. As suggested by the Commission, the Secretariat requested all the member country embassies located in Madrid to assist in the distribution of publications to their countries' subscribers. The embassies of the following countries have kindly offered to help the ICCAT and therefore their publications have been sent via embassies:

Angola, Brazil, Canada, Cuba, Portugal, Venezuela.

## 8. Secretariat and Administration

### 8.1 Staff

Mr. J. P. Wise (ICCAT biostatistician) left the Secretariat upon termination of his contract with ICCAT on December 31, 1986. No attempt has been made to fill the position due to the shortage of funds. The routine biostatistical work has been covered by the remaining Secretariat staff with the idea that when the necessity arises, a specialist could be recruited on a short-term contract.

The current Secretariat staff (as of October 15, 1987) consists of the Executive Secretary, Assistant Executive Secretary, and Systems Analyst in the U.N. Professional Category, six multi-lingual secretaries, an assistant programmer, a statistical secretary and a clerk in the U.N. General Services Category and four locally contracted staff members.

## 8.2 Trips

Due to budgetary constraints, several trips to attend scientific meetings and to fulfill statistical missions could not be made. In addition to the trips made by staff members reported in previous sections of this report (in relation to the meetings and special activities), the following trips were taken by ICCAT staff:

a) On February 2-11, 1987, the Executive Secretary traveled to Venezuela to visit the scientific and government authorities in order to reinforce collaboration with ICCAT. While there, he discussed the spectacular growth of tuna fisheries in Venezuela and the obligations contracted by member countries with the Commission.

On this trip, the Executive Secretary coincided with Dr. A. Fonteneau, who was traveling to Venezuela and to Martinique on an official mission for ORSTOM. Together they visited the Succor FONAIAP Experimental Station in Cumaná.

b) The Executive Secretary traveled to Dakar, Senegal on June 8-12, 1987. He visited various government authorities to discuss matters relating to the Commission's policies, finances and research. He was accompanied by Mr. P. Kebe who was already in Dakar to attend the meeting of the Working Group on Juvenile Multi-species Statistics.

c) The Executive Secretary visited São Miguel, Azores, at the invitation of the Regional Government of Azores, to examine and select the conference site and accommodations for the 1987 Commission meeting.

d) In accordance with the Staff Rules, the Commission paid home leave trips for both the Assistant Executive Secretary and the Systems Analyst and their families to their respective countries of origin. Staff in the Professional Category are entitled to home leave every two years.

FINANCIAL REPORT 1987
COM/87/9 (Amended)*

REGULAR BUDGET

I. FISCAL YEAR 1986

1. Auditor's Report

The Auditor has examined the books and accounts of the Commission up to December 31, 1986. In accordance with Articles 9-3 and 12-7 of the Financial Regulations, and following a recommendation of the Council at its Second Regular Meeting, the Secretariat mailed a copy of the Auditor's Report to all the member country governments in May, 1987. An extract of this Report has been included in the "Report for Biennial Period, 1986-87, Part I".

In his report, the Auditor referred, in particular, to the serious financial situation of the Commission and called attention to the necessity of adopting "the necessary measures to rectify the declining trends observed in the final financial situation and budgets, which could, over the short-term, affect the Commission's survival."

2. Financial Status at the end of the first half of the 1986 Biennial Budget

Statement 1 shows the Balance Sheet to the end of Fiscal Year 1986. There was a balance of $348,981.72 at the end of the Fiscal Year. After applying the amounts approved by the Commission, there were $189,361.70 available in the Working Capital Fund.

Member country contributions pending payment amounted to $358,458.50.

II. FISCAL YEAR 1987

1. Regular Budget 1986-1987

Statement 2 shows the Regular Budget approved by the Commission at its Ninth Regular Meeting (Palma de Mallorca, November 1985) which amounted to $750,000 for each of these two years. (See Appendix 3 to Annex 9 of the 1985 STACFAD Report, Report for Biennial Period 1984-85, Part II.)

*Updated to the end of Fiscal Year 1987. Modifications agreed upon by the Commission have been included.

The total Budget has remained practically the same for the five previous years.

| 1981 | 1982 | 1983 | 1984 | 1985 |
|---|---|---|---|---|
| $750,000 | $750,000 | $825,000 | $700,000 | $750,000 |

When the Executive Secretary presented the Financial Report at the Fifth Special Meeting (Madrid, November, 1986), he emphasized the difficulties encountered in Fiscal Year 1986, due to the decline of the U.S. dollar value with respect to the peseta and by the progressive accumulation of pending contributions.

The Executive Secretary proposed maintaining the 1987 Budget at the level approved for 1985 (i.e. $750,000) and noted that this budget should be covered entirely by the member country contributions.

However, after considerable debate, it was agreed to reduce the Budget to $690,000 and to apply $115,000 from the Working Capital Fund, in order to maintain the country contributions at the same level as in previous years, i.e. $575,000 (Report for Biennial Period 1986-87, Part I, pp. 119-132). These decisions resulted in even more serious financial problems for the Commission, as explained in document COM/87/12.

2. Financial status of the 2nd half of the biennial budget - 1987

Statement 3 shows the status of the member country contributions up to December 31, 1987.

In order to cover the budget, $575,000 from member country contributions should have been received. Of this amount, $365,144.00 (i.e., only 63 %) have been paid. Therefore, $209,856 in contributions are outstanding for 1987.

There are contributions pending payment corresponding to 1987 and/or other years from: Benin, Brazil, Cape Verde, Côte d'Ivoire, Cuba, Gabon, Ghana, Morocco, Portugal, São Tomé & Principe, Senegal, and Venezuela, for an accumulated total of $509,576.50.

Statement 4, the Budget and Expenditures to the end of Fiscal Year 1987, shows a negative balance of $21,886.37

| | | |
|---|---|---|
| I. Expenditures for Fiscal Year 1987 amount to: | | $711,886.37 |
| II. Funds available for this Fiscal Year are: | | |
| i) 1987 Contributions..... | 345,020.00 | |
| ii) Advance paid by Angola in 1986 towards 1987 Budget..... | 14,547.00 | |
| iii) Advance paid by Uruguay in 1986 towards 1987 Budget..... | 5,577.00 | |
| | 365,144.00 | |
| iv) Applied from Working Capital Fund.. | 115,000.00 | 480,144.00 |
| Difference..... | | $231,742.37 |

The only solution to cover this difference is to apply this amount ($231,742.37) from the Working Capital Fund.

Consequently, to meet the expenses of Fiscal Year 1987, a total of $346,742.37 ($115,000 + $231,742.37) was applied from the Working Capital Fund.

3. General Comments on the Regular Budget

Maximum austerity and severe cuts in expenses of various chapters have been applied. However, during this Fiscal Year, the following factors had a considerable effect on the Commission's finances:

i) Increase in expenses due to the unfavorable exchange rate (U.S. dollar/peseta). Devaluation of the U. S. dollar.
ii) Tremendous accumulated delays in the payment of member country contributions.
iii) Reduction in the Working Capital Fund to compensate for the pending contributions.
iv) Insufficient budget approved.

The influence of these factors was analyzed in detail in document COM/87/12.

Chapter 1 - SALARIES

This Chapter includes the salaries of 12 staff members: the Executive Secretary, the Assistant Executive Secretary, six multi-lingual secretaries, and one administrative assistant. Besides, contracted at the local level, a receptionist, a copy machine operator and a messenger) are also included in this chapter.

The breakdown is as follows:

| | |
|---|---|
| i) Salaries ..... | $335,777.30 |
| ii) Van Breda Pension Fund (P+G)..... | 40,745.53 |
| iii) Spanish Social Security (L.C.).... | 10,368.02 |
| | $386,890.85 |

NOTE: P = Professional
G = General Services
L.C.= Local Contract

In spite of the fact that November and December salaries were frozen at the October level (in terms of dollars), this Chapter ends with a negative balance of $69,890.85. This is due to the devaluation of the U.S. dollar,

i.e., while maintaining salaries in pesetas at the same level (January through October), there was a 21% increase in U.S. dollar amounts.

## Chapter 2 - TRAVEL

The Administrative Report (COM/87/8) and the Secretariat Report on Statistics and Coordination of Research (COM/87/13) mentions the official trips made by Secretariat personnel and the missions accomplished.

The following trips made by the Executive Secretary have been included in this Budget chapter:

--Azores (Portugal), to organize the 1987 annual meeting on the island of São Miguel.

--Dakar (Senegal), to discuss matters concerning Senegal and ICCAT with Senegalese authorities.

--Caracas (Venezuela), to discuss matters concerning Venezuela and ICCAT with Venezuelan authorities.

Home leave trip expenses of the Assistant Executive Secretary and his family to Tokyo were also charged to this chapter.

Although trips of administrative nature as well as participation at scientific meetings of other international fisheries organizations were canceled, this chapter shows a negative balance of $2,309.63

## Chapter 3 - ANNUAL MEETING

A breakdown of the expenses incurred are as follows:

| | SCRS (Madrid) | COM (Azores) | TOTAL |
|---|---|---|---|
| i) Secretariat (local transport, overtime) & others ..... | $8,912.28 | $5,982.74 | |
| ii) Simultaneous interpretation, salaries (6)..... | 7,138.11 | 10,238.90 | |
| iii) Extra staff (1 receptionist-telephone operator)..... | 432.43 | 0.00 | |
| iv) Hotel: meetings rooms, offices, coffee break & misc. ..... | 5,588.39 | 0.00 | |
| v) Simultaneous translation equipment..... | 3,783.78 | 0.00 | |
| vi) Photocopy machines..... | 3,164.70 | 0.00 | |
| vii) Material, installation & misc. | 449.51 | 1,689.92 | |
| viii) Travel-Secretariat (5)..... | 0.00 | 1,819.81 | |
| ix) Per diem-Secretariat (10)..... | 0.00 | 10,395.00 | |
| Totals..... | $29,469.20 | $30,126.37 | $59,595.57 |

We should point out the many facilities and help received from the Regional Government of Azores, such as:

i) Meeting rooms and offices in the Hotel Bahia Palace
ii) Air fare and per diem for the interpreters
iii) Air fare for 5 members of the Secretariat staff
iv) Simultaneous translation equipment
v) Transport of equipment and documents: Madrid/Lisbon/Ponta Delgada and back
vi) As a courtesy, translation into Portuguese was added at their expense

Thanks to this financial assistance it was possible to hold the Commission Meeting outside of Madrid. Besides, this chapter shows a positive balance of $3,404.43.

Chapter 4 - PUBLICATIONS

The publications charged to this Budget chapter are listed in the Administrative Report (COM/87/8). There is a positive balance of $7,016.09.

This chapter shows the biggest cut in expenses, since all printing work, except binding, was done at the Secretariat.

Chapter 5 - OFFICE EQUIPMENT

Expenses were cut drastically in this chapter this year. Only an essential accessory was acquired for the DECmate; consequently, there is a positive balance of $6,927.06.

Chapter 6 - OPERATING EXPENSES

This chapter includes expenses of office material, reproduction of documents, mailing, telephone, cables, telex, distribution of documents and publications, equipment maintenance contracts, auditor's honorariums, security bond, electricity, office cleaning, and others.

A breakdown of expenses incurred in this chapter are as follows:

| | |
|---|---|
| i) Office material ..... | $4,282.70 |
| ii) Reproduction of documents..... | 7,150.96 |
| iii) Mailing..... | 8,954.49 |
| iv) Telephone..... | 7,670.56 |
| v) Cables and Telex..... | 5,394.55 |
| vi) Equipment maintenance contracts..... | 12,782.74 |
| vii) Auditor's honorariums..... | 2,811.02 |
| viii) Security bond..... | 912.82 |
| ix) Electricity..... | 3,671.92 |
| x) Office cleaning..... | 4,337.04 |
| xi) Administrative services of accounting & misc. ..... | 3,892.41 |
| Total ..... | $61,861.21 |

This chapter shows a positive balance of $6,138.79.

Chapter 7 - MISCELLANEOUS

The expenses incurred in this Budget chapter include: minor office repairs, office insurance (fire, theft and liability), local transportation for office business and, generally, other miscellaneous expenses which are not applicable to other Budget chapters.

This chapter shows a positive balance of $1,084.54

Chapter 8 - COORDINATION OF RESEARCH

a) Staff

This sub-chapter includes the salaries of four staff members: the systems analyst, one assistant programmer, one statistical assistant and a data entry clerk (contracted at the local level). Also included are the expenses of observers/port samplers in Las Palmas de Gran Canaria, St. Maarten, Cape Town and Abidjan.

The breakdown is as follows:

I. Secretariat staff

| | | |
|---|---|---|
| i) Salaries ..... | $95,277.44 | |
| ii) Van Breda Pension Fund (P+G)..... | 11,155.00 | |
| iii) Spanish Social Security (L.C.).... | 2,700.00 | $109,132.44 |

II. Samplers' contracts

| | | |
|---|---|---|
| i) Las Palmas ..... | $2,945.67 | |
| ii) St. Maarten ..... | 4,723.00 | |
| iii) Cape Town ..... | 3,009.00 | |
| iv) Abidjan ..... | 1,429.63 | 12,107.30 |
| Total ..... | | $121,239.74 |

Since the position of biostatistician is vacant and no specialists were contracted to carry out biostatistical work, this sub-chapter shows a positive balance of $13,760.26.

b) Travel

Expenses of trips concerning statistical and sampling activities are included in this sub-chapter, such as:

The Assistant Executive Secretary's trips to:

--Rome (Italy), to attend the CWP (FAO) meeting
--La Jolla, California ((U.S.A), to attend the meeting of the Ad Hoc Consultation on Global Tuna Statistics

The Systems Analyst's trips to:

--Dakar (Senegal), for home leave (biannual), with his family
--Dakar (Senegal), to attend meeting of the Working Group on Juvenile Multi-species Statistics at the CRODT.

Also charged to this sub-chapter are $967.59, the cost of the trip made by A. Rodríguez (Cuba), to attend a statistical and sampling training course, financed by ICCAT, which was held at approximately the same time as the Skipjack Conference in 1983. This expense was not accounted for until now because of administrative delays of the American Express Travel Agency.

This sub-chapter ends with a negative balance of $2,139.29.

c) Office Equipment

The cost of small accessories have been applied to this sub-chapter, which shows a positive balance of $7,962.82

d) Data Processing

The majority of the expenses of this sub-chapter corresponds to the maintenance contracts with the Digital Equipment Corp. even though payment of this contract started in June when the one-year guarantee expired. The remainder of the expenses corresponds to material. This sub-chapter shows a negative balance of $999.91.

e) Meetings during the year (Sub-Committees, Working Groups, etc.)

Two meetings were held:

i) Working Group on Juvenile Multi-species Statistics-Dakar (Senegal): $6,916.56.
ii) Swordfish Workshop - Madrid (Spain): $4,773.28.

This sub-chapter ends with a negative balance of $1,689.84.

f) Miscellaneous

This sub-chapter includes the amount of $5,138 for the shipment of personal effects of the biostatistician, J. Wise, from Madrid to New York, upon termination of his contract with the Commission. Also included is a lottery prize of $500 for the recovery of tags.

The sub-chapter shows a negative balance of $1,150.82.

BILLFISH PROGRAM

All of the expenses incurred for this Program were charged to the Trust Fund.

4. Income and Disbursements of the Regular Budget

Statement 5 shows the Income and Disbursements of Fiscal Year 1987. In addition to income received ($345,020.00) from 1987 contributions, $58,738.00 were received from contributions corresponding to previous years but paid during this Fiscal Year. Interest income ($25,547.48) and minor income from the sale of books and a typewriter no longer used in the Secretariat were also deposited.

This statement also shows the expenses incurred during the Fiscal Year ($711,886.37) and the balance in Cash and Bank ($72,590.29).

5. Review of the Working Capital Fund

Statement 6 shows the present status of the Working Capital Fund.

At the end of the Fiscal Year 1986, there were $189,361.70 available in the Fund. Bank interest earned, pending contributions corresponding to previous years, and the sale of a typewriter which is no longer used at the office and books were also deposited to the Fund. A reimbursement of $6,665.02 from the Digital Equipment Corp. was also deposited, which corresponded to an exemption of import taxes on the Micro-Vax II acquired and paid for in Fiscal Year 1985 but reimbursed in Fiscal Year 1986.)

Besides the $175,000 from the Working Capital reallocated to the Budget by the Commission at its 1985 Meeting, an additional $231,742.37 have been used from the Fund towards the 1987 Budget.

Consequently, the cash available in the Working Capital Fund at the end of Fiscal Year 1987 amounts to $49,410.29.

To this amount, $68,438.17, from the positive balance of the Yellowfin year Program, should be added. The Working Capital Fund, therefore, amounts to (as of December 31, 1987) $117,848.46.

At any rate, it will be absolutely essential to replenish the Working Capital Fund to the minimum levels approved by the Commission, as indicated in Document COM/87/19.

We wish to insist once again that experience has shown that the Working Capital Fund is an invaluable recourse to use:

i) In the early part of the year before any contributions are received;
ii) To cover negative balances of the 1987 Budget.
iii) To cover payments in arrears.

Consequently, it is fundamental to maintain this Fund in order to ensure the normal pace of Commission activities.

6. Balance Sheet at the end of Fiscal Year 1987

Statement 7 shows the Balance Sheet to the end of the Fiscal Year.

The Commission enters 1988 with little cash on hand. There are only $117,848.46 in the Working Capital Fund, with an advance from Angola of $17,831 and another advance from Uruguay for $5,349.00. These are the only resources available as of January 1, 1988.

III. YELLOWFIN YEAR PROGRAM

At its Ninth Regular Meeting (November 1985), the Commission approved this Program, with a budget of $175,000, financed by the Working Capital Fund.

In 1986, expenses amounted to $62,695, leaving a positive balance of $112,304.91 at the end of that Fiscal Year available for the Program (Report for Biennial Period, 1986-87, Part I).

In Fiscal Year 1987, Program activities continued, with expenditures totaling $18,866.74:

| | | | |
|---|---|---|---|
| 1) | ICCAT/ORSTOM contract fuel "Nizery" ..... | $13,291.23 | |
| 2) | ICCAT/Venezuela Program ..... | 4,745.52 | |
| 3) | Tagging Program F.X. Bard, Ghana ..... | 1,019.05 | |
| 4) | Program - LOTTERY ..... | 496.03 | $19,551.83 |
| 5) | Reimbursement Program ICCAT/Spain 1986 ..... | | 685.09 |
| | Total ..... | | $18,866.74 |

These amounts include bank expenses for transfers, checks, etc.

The SCRS has estimated expenses to the end of the Program of $25,000, and the Commission approved it. A breakdown is as follows:

| | | |
|---|---|---|
| 1) | Expenses of the technical meeting in Dakar ..... | $ 3,000.00 |
| 2) | Expenses of the meeting in Madrid | 2,000.00 |
| 3) | YYP Lottery ..... | 1,000.00 |
| 4) | Analysis of otoliths/vertebrae.... | 8,000.00 |
| 5) | Travel ..... | 2,000.00 |
| 6) | Publication of results ..... | 5,000.00 |
| 7) | Miscellaneous expenses ..... | 4,000.00 |
| | Total ..... | $25,000.00 |

Consequently:

| | | |
|---|---|---|
| Balance at the end of Fiscal Year 1986: | | $112,304.91 |
| i) Expenses Fiscal Year 1987 ..... | $18,866.74 | |
| ii) Forecast to end of Program ..... | 25,000.00 | 43,866.74 |
| Positive balance ..... | | $ 68,438.17 |

As understood when applying the Working Capital Fund to the Yellowfin Year Program and in accordance with a suggestion made by the SCRS, the Commission decided that this balance would be re-deposited to the Working Capital Fund.

## IV. FUNDS FROM PRIVATE SOURCES (TRUST FUND)

During Fiscal Year 1987, a special account was opened in the Banco Exterior de España, in the Commission's name, to deposit funds from private resources for the Program of Enhanced Research for Billfish.

These resources were received through the United States delegation to ICCAT and are as follows:

| Date | Origin | |
|---|---|---|
| March 21, 1987 | The Billfish Foundation..... | $ 5,000 |
| October 21, 1987 | South Florida Fishing Classic, Inc.. | 10,000 |
| " " " | Key West Marlin Tournament..... | 5,000 |
| " " " | Florida Conservation Association of Tallahassee..... | 5,000 |
| " " " | Florida Conservation Association of West Palm Beach..... | 500 |
| | TOTAL..... | $25,500 |

From these funds, the following amounts have been spent:

| | |
|---|---|
| i) Trip by E. Prince (U.S.A.) and P. M. Miyake to Venezuela..... | $2,835.74 |
| ii) Billfish Sampling Program of Venezuela (part 1) ..... | 2,004.00 |
| iii) "Floy Tag" - Tags for Billfish ..... | 1,581.00 |
| iv) Billfish Sampling Program of Venezuela (part 2) ..... | 1,008.00 |
| Total ..... | $7,428.74 |

In summary:

| | |
|---|---|
| 1) Income ..... | $25,500.00 |
| 2) Expenses ..... | 7,428.74 |
| Positive balance ..... | $18,071.26 |

V. GENERAL BALANCE SHEET AT CLOSE OF FISCAL YEAR 1987

Statement 8 shows the Balance Sheet of the Commission at the end of Fiscal Year 1987.

O. Rodríguez Martín
Executive Secretary

STATEMENT 1

Balance Sheet of the Regular Budget - Fiscal Year 1986 - $USA

| A S S E T S | | L I A B I L I T I E S | | |
|---|---|---|---|---|
| Cash and Bank . . . . . | 348,981.72 | Available in Working Capital Fund . . . | 189,361.70 | |
| | | Advance on 1987 Budget (Angola) . . . . | 32,378.00 | |
| Contributions pending payment . . | 358,458.50 | Advance on 1987 Budget (Uruguay). . . . | 5,577.00 | |
| | | Reimbursement from Digital Equipment. . | 6,665.02 | |
| | | Applied to 1987 Budget. . . . . | 115,000.00 | 348,981.72 |
| | | Contributions pending payment: | | |
| | | i) for 1982 and before. . . . . | 31,165.27 | |
| | | ii) from 1983. . . . . | 53,469.99 | |
| | | iii) from 1984. . . . . | 63,031.00 | |
| | | iv) from 1985. . . . . | 70,575.00 | |
| | | v) from 1986. . . . . | 140,217.24 | 358,458.50 |
| TOTAL . . . . . | 707,440.22 | TOTAL . . . . . | | 707,440.22 |

STATEMENT 2

Regular Budget, 1986-87 (US$)

| Chapter | 1986* (750,000) | 1987* (750,000) | 1987** (690,000) |
|---|---|---|---|
| 1. Salaries | 300,000 | 300,000 | 317,000 |
| 2. Travel | 15,000 | 15,000 | 12,000 |
| 3. Annual Meeting | 78,000 | 78,000 | 63,000 |
| 4. Publications | 32,000 | 32,000 | 22,000 |
| 5. Office Equipment | 10,000 | 10,000 | 8,000 |
| 6. Operating Expenses | 68,000 | 68,000 | 68,000 |
| 7. Miscellaneous | 10,000 | 10,000 | 5,000 |
| Subtotal | 513,000 | 513,000 | 495,000 |
| 8. Coordination of Research | | | |
| a) Salaries | 160,000 | 160,000 | 135,000 |
| b) Travel | 13,000 | 13,000 | 10,000 |
| c) Office Equipment | 5,000 | 5,000 | 10,000 |
| d) Data processing | 34,000 | 34,000 | 15,000 |
| e) Meetings during the year (Sub-Committees, Working Groups, etc.) | 20,000 | 20,000 | 10,000 |
| f) Miscellaneous | 5,000 | 5,000 | 5,000 |
| Program of Enhanced Research for Billfish | 0 | 0 | 10,000 |
| Subtotal | 237,000 | 237,000 | 195,000 |
| TOTAL | 750,000 | 750,000 | 690,000 |
| From Working Capital Fund | 175,000 | 175,000 | 115,000 |
| From Member Country Contributions | 575,000 | 575,000 | 575,000 |

*Approved by the Commission at the Ninth Regular Meeting (Palma de Mallorca, November, 1985).

**Revised by the Commission at the Fifth Special Meeting (Madrid, November, 1986).

STATEMENT 3

Status of Member Country Contributions at end of Fiscal Year 1987 - Regular Commission Budget (US$) (as of December 31, 1987)

| Country | 1986 Balance | Contributions for 1987 Approved by the Commission | Contributions Paid Towards the 1987 Budget | Past Due** or Other Contributions | Balance Pending Payment |
|---|---|---|---|---|---|
| Angola | 0.00 | 14,547 | (14,547.00)* | 0.00 | 0.00 |
| Benin | 28,160.00 | 3,960 | 0.00 | 0.00 | 32,120.00 |
| Brazil | 1,379.00 | 26,403 | 0.00 | 1,379.00 | 26,403.00 |
| Canada | 0.00 | 16,247 | 16,247.00 | 0.00 | 0.00 |
| Cape Verde | 9,381.00 | 9,381 | 0.00 | 9,381.00 | 9,381.00 |
| Cuba | 17,172.24 | 17,713 | 0.00 | 0.00 | 34,885.24 |
| France | 0.00 | 64,088 | 64,088.00 | 0.00 | 0.00 |
| Gabon | 30,883.11 | 7,831 | 0.00 | 0.00 | 38,714.11 |
| Ghana | 135,494.27 | 36,578 | 0.00 | 0.00 | 172,072.27 |
| Côte d´Ivoire | 9,000.00 | 19,359 | 0.00 | 9,000.00 | 19,359.00 |
| Japan | 0.00 | 39,633 | 39,633.00 | 0.00 | 0.00 |
| Korea | 0.00 | 26,234 | 26,234.00 | 0.00 | 0.00 |
| Morocco | 53,879.00 | 14,901 | 0.00 | 21,000.00 | |
| | | | | 17,978.00 | 29,802.00 |
| Portugal | 0.00 | 22,439 | 0.00 | 0.00 | 22,439.00 |
| São Tomé and Principe | 8,035.00 | 4,064 | 4,064.00 | 0.00 | 8,035.00 |
| Senegal | 41,741.88 | 12,618 | 0.00 | 0.00 | 54,359.88 |
| South Africa | 0.00 | 9,674 | 9,674.00 | 0.00 | 0.00 |
| Spain | 0.00 | 118,757 | 118,757.00 | 0.00 | 0.00 |
| U.S.A | 0.00 | 46,218 | 46,218.00 | 0.00 | 0.00 |
| Uruguay | 0.00 | 5,805 | 228.00 | | |
| | | | (5,577.00)* | 0.00 | 0.00 |
| U.S.S.R | 0.00 | 19,877 | 19,877.00 | 0.00 | 0.00 |
| Venezuela | 23,333.00 | 38,673 | 0.00 | 0.00 | 62,006.00 |
| Total | 358,458.50 | 575,000 | 345,020.00 | 58,738.00 | 509,576.50 |
| | | | +(20,124.00)* | | |
| | | | 365,144.00 | | |

*Deposited and accounted for in Fiscal Year 1986.

**To the Working Capital Fund.

Budget, Expenditures and Balance of Regular Budget for Fiscal Year 1987 (US$)

| Chapter | I 1987 Budget (690,000)* | II Actual Expenses Fiscal Year 1987 | III Difference |
|---|---|---|---|
| 1. Salaries | 317,000 | 386,890.85 | -69,890.85 |
| 2. Travel | 12,000 | 14,309.65 | - 2,309.65 |
| 3. Annual Meeting | 63,000 | 59,595.57 | + 3,404.43 |
| 4. Publications | 22,000 | 14,983.91 | + 7,016.09 |
| 5. Office Equipment | 8,000 | 1,072.94 | + 6,927.06 |
| 6. Operating Expenses | 68,000 | 61,861.21 | + 6,138.79 |
| 7. Miscellaneous | 5,000 | 3,915.46 | + 1,084.54 |
| Subtotal | 495,000 | 542,629.59 | - 47,629.59 |
| 8. Coordination of Research | | | |
| a) Salaries | 135,000 | 121,239.74 | +13,760.26 |
| b) Travel** | 10,000 | 12,139.29 | - 2,139.29 |
| c) Office Equipment*** | 10,000 | 2,037.18 | + 7,962.82 |
| d) Data processing | 15,000 | 15,999.91 | - 999.91 |
| e) Meetings during the year (Sub-Committees, Working Groups, etc.) | 10,000 | 11,689.84 | - 1,689.84 |
| f) Miscellaneous | 5,000 | 6,150.82 | - 1,150.82 |
| Program of Enhanced Research for Billfish | 10,000 | 0.00 | +10,000.00 |
| Subtotal | 195,000 | 169,256.78 | +25,743.22 |
| TOTAL | 690,000 | 711,886.37 | -21,886.37 |
| From Working Capital Fund | 115,000 | | |
| From Member Country Contributions | 575,000 | | |

*Approved by the Commission at the Ninth Regular Meeting (Palma de Mallorca, November, 1985) and revised by the Commission at the Fifth Special Meeting (Madrid, November, 1986).

**For improvement of statistics.

***Electronic equipment.

STATEMENT 5

Regular Budget - Income and Disbursements - Fiscal Year 1987 (US $)

| INCOME | | | DISBURSEMENTS | |
|---|---|---|---|---|
| Cash and Bank (at end of FY 1986). . . . . | | 348,981.72 | From Fiscal Year 1987 . . . . . | 711,886.37 |
| -- Pending 1987 contributions. . | 345,020.00 | | Available in Cash and Bank. . . . . | 72,590.29 |
| -- Past due contributions. . . . | 58,738.00* | | | |
| -- Bank interest (1987). . . . . | 25,547.48* | | | |
| -- Other income. . . . . | 840.46* | 430,145.94 | | |
| -- Advance from Uruguay (1988) . | | 5,349.00 | | |
| TOTAL. . . . . | | 784,476.66 | TOTAL . . . . . | 784,476.66 |

* To the Working Capital Fund.

STATEMENT 6

Regular Budget - Working Capital Fund at end of Fiscal Year 1987 (US $)

| | | | |
|---|---|---|---|
| Balance at end of Fiscal Year 1986. . . . . | | 189,361.70 | |
| -- Bank Interest (1987) . . . . . | 25,547.48 | | |
| -- Past due contributions (from other years). . . . . | 58,738.00 | | |
| -- Other income . . . . . | 840.46 | | |
| -- Reimbursement from Digital Equip. Corp. . . . . | 6,665.02 | 91,790.96 | 281,152.66 |
| Deductions: | | | |
| -- To cover pending 1987 contributions. . . . . | | 209,856.00 | |
| -- To cover negative balance of FY 1987 . . . . . | | 21,886.37 | 231,742.37 |
| Working Capital Fund - Regular Budget . . . . . | | | 49,410.29 |
| Balance of the Yellowfin Year Program . . . . . | | | 68,438.17 |
| Total Working Capital Fund available at end of Fiscal Year 1987 . | | | 117,848.46 |

STATEMENT 7

Regular Budget - Balance Sheet at the end of Fiscal Year 1987 (US $)

| A S S E T S | | L I A B I L I T I E S | | |
|---|---|---|---|---|
| Cash and Bank . . . . . | 72,590.29 | Available in Working Capital Fund . | 49,410.29 | |
| Accumulated pending contributions . . | 509,576.50 | In favor of Angola. . . . . | 17,831.00 | |
| | | In favor of Uruguay . . . . . | 5,349.00 | 72,590.29 |
| | | Contributions pending payment: | | |
| | | i) from 1982 and before . . . . | 31,165.27 | |
| | | ii) from 1983 . . . . . | 53,469.99 | |
| | | iii) from 1984 . . . . . | 44,223.00 | |
| | | iv) from 1985 . . . . . | 50,405.00 | |
| | | v) from 1986 . . . . . | 120,457.24 | |
| | | vi) from 1987 . . . . . | 209,856.00 | 509,576.50 |
| TOTAL . . . . . | 582,166.79 | TOTAL . . . . . | | 582,166.79 |

The following contributions have also not yet been paid:

| | |
|---|---|
| Equatorial Guinea (Regular Budget) . . . . . | 2,000.00 |
| Ghana (Special Skipjack Budget) . . . . . | 4,800.00 |
| Benin (Special Skipjack Budget) . . . . . | 3,044.70 |

STATEMENT 8

General Balance Sheet at Close of Fiscal Year 1987 (US$)

| ASSETS | | | LIABILITIES | |
|---|---|---|---|---|
| Available: (Banco Exterior de España) | | | Acquired holdings and Guaranty deposit | 269,060.64 |
| Acct. 84-31279-Z (time deposit) | | 102,462.09 | | |
| Acct. 82-31279-Q (US$) | | 54,263.48 | Available in the Working Capital Fund | 117,848.46 |
| Acct. 30-17672-A (Pts.) | 1,180,528.00 | | | |
| Acct. 30-17329-F (Convert. Pts.) | 3,206.00 | | Yellowfin Year Program | 25,000.00 |
| Cash on hand (Pts.) | 15,717.00 | | | |
| (1US$ = 110 Pts.) | 1,199,451.00 | 10,904.10 | Advance from: | |
| | | 167,629.67 | Angola | 17,831.00 |
| Difference in exchange rate | | -1,601.21 | Uruguay | 5,349.00 |
| | | 166,028.46 | | |
| Availalable Billfish Research Program: | | | Available Billfish Research Program: | |
| | | | Received: 25,500.00 | |
| Acct. 82-31555-N (US$) | | 18,071.26 | Used: -7,428.74 | 18,071.26 |
| | | | Contributions pending payment: | |
| Receivables: | | | Regular Budget | 509,576.50 |
| From Regular Budget: | | | Special Skipjack Budget | 7,844.70 |
| Benin | 32,120.00 | | Extrabudgetary - Equatorial Guinea | 2,000.00 |
| Brazil | 26,403.00 | | | |
| Cape Verde | 9,381.00 | | | |
| Cuba | 34,885.24 | | | |
| Gabon | 38,714.11 | | | |
| Ghana | 172,072.27 | | | |
| Côte d´Ivoire | 19,359.00 | | | |
| Morocco | 29,802.00 | | | |
| Portugal | 22,439.00 | | | |
| São Tomé & Principe | 8,035.00 | | | |
| Senegal | 54,359.88 | | | |
| Venezuela | 62,006.00 | 509,576.50 | | |
| Extrabudgetary: | | | | |
| Equatorial Guinea | | 2,000.00 | | |
| From Skipjack Budget: | | | | |
| Benin | 3,044.70 | | | |
| Ghana | 4,800.00 | 7,844.70 | | |
| Fixed Assets: | | | | |
| Acquired before 1987, in use | 267,831.00 | | | |
| Acquired during 1987, in use | 414.00 | 268,245.00 | | |
| Guaranty deposit | | 815.64 | | |
| TOTAL ASSETS | | 972,581.56 | TOTAL LIABILITIES | 972,581.56 |
| 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: O. Rodríguez Martín

Certified by the Auditor: B. Tahoces Acebo

# SECRETARIAT REPORT ON STATISTICS AND COORDINATION OF RESEARCH

SCRS/87/13 (Amended)

## I. DATA COLLECTION AND SAMPLING

### 1. Collection of 1986 statistics through national offices

Progress made by the national offices and by the Secretariat is shown in Table 1 of Appendix 7 to Annex 10 (Report of the Sub-Committee on Statistics. Reporting of the previous year's Task I data by national offices was somewhat better and faster in 1987 than in 1986, which was the worst recent year.

However, as usual, several reminders in the form of cables and telexes had to be sent requesting countries to submit data before we got the majority of the catch statistics. As of August 31, 1987, Task I data, i.e., total catches by species, were received for almost all the major fisheries, with the exception of the Venezuelan, Ghanaian, Azorian and Cuban fisheries and Japanese longline catches. Spanish data were received from a few different sources and some discrepancies in the data could not be clarified by that time.

The submission of Task II catch and effort and size data has been very slow this year. As of the end of September we still lack 1986 data for the following major fisheries.

Catch and effort: FIS, Cuba, Azores, Ghana (partly), Venezuela, USSR, Spain (Bay of Biscay), France (bluefin and albacore), Japan (longline), and Italy.

Size data: FIS, Azores, Spain (tropical and Bay of Biscay), Ghana, USSR, France (bluefin and albacore), Japan (longline except bluefin), and Italy.

### 2. Improvements and remaining difficulties

#### a) Venezuelan statistics

The 1985 data estimated in 1986 were critically reviewed by the Secretariat using the copies of logbooks which were received at the Secretariat in early 1987 from the Statistical Office of Venezuela. Some records for the Pacific were removed by using the newly developed checking program. Some double reporting of catches by foreign flag boats based at Venezuela

was corrected. The problem of mixed catches between the Pacific and Atlantic is also being solved through collaboration with the Inter-American Tropical Tuna Commission (IATTC).

Copies of logbooks have been carefully verified and adjusted for missing effort data in reporting and reprocessed into ICCAT Task II format. The results have been returned to Venezuela for their use and also added to the ICCAT base (and are reported in Data Record 28).

The biological sampling system, established in 1985 with the assistance of a U.S. expert sent by ICCAT to Venezuela, was temporarily discontinued in late 1985 but was resumed in 1986 and continued in 1987. The data received at the Secretariat were processed and returned to Venezuela for use by its scientists. Document SCRS/87/11 summarizes the data processing done by the Secretariat.

During 1987, the Venezuelan scientists received somewhat conflicting advice from two different sources on sampling procedures. Finally, it was clarified and the system has been slightly modified to be more proportional to catches than stratified. Also, the sampling was expanded to include billfishes, particularly from longliners, in accordance with the Program of Enhanced Research for Billfish.

b) East Mediterranean tuna catch data

Due to the shortage in Commission funds, no substantial improvements were made. However, the results of various contacts established at the last meeting of the General Fisheries Council for Mediterranean (GFCM) (October, 1986, Monaco) through participation by the Assistant Executive Secretary has been producing quite positive results.

Some correspondence between Turkey confirmed the development of new winter fisheries generated by exporting bluefin tuna to the Japanese sashimi market. Descriptions of bluefin and swordfish fisheries of that country were submitted at this meeting (SCRS/87/78). Turkey began measuring bluefin tuna in 1987 and hopefully the results will become available within a short period.

It was reconfirmed that the recent big increase (up to 2,000 MT) in bluefin catches reported to FAO was due to the mixture of all tuna species, mostly albacore. In accordance with the advice from a member of the Greek Government, ICCAT is maintaining 500 MT as its estimated total bluefin catch. However, there is a joint venture for bluefin starting between Greece and Japan. This development should be carefully monitored.

c) Delay in Japanese longline catch data

In the past, Japanese longline data were always reported with a two-year time lag. It is well understood that the boats make trips lasting over 14 months, and therefore, data processing could not be started until after

the middle of the next year of the fishery. Since the longliners are fishing all over the world, this is not only a problem for the Atlantic fisheries, which are only a minor part of their operation.

Catches by Taiwanese and Korean longliners have been reported on time. Although their longliners are different from the Japanese longliners in that they are mostly based at a foreign port, the major reason for their quick reporting is that the Task I data are estimated from daily catch reports received through cables, which are later cross-checked with landing and logbook records.

The Japanese data are based solely on logbook records, and therefore, have to wait until the logbooks have all been recovered. This procedure produces much more accurate and reliable catch data which are consistent with Task II data.

However, as the data submission from various countries has improved this year, the delay in reporting one fishery may invalidate all other efforts. As discussed above, this year, Venezuelan and Cuban catch data and Japanese longline data were the only major fisheries for which the scientists did not have at least quick estimates.

If Japan could make preliminary estimates of total catches, based on the catch records received by telegram at its industry headquarters, it would improve the situation tremendously. The data could be further corrected when more accurate data become available the following year.

3. Port sampling by the Secretariat

a) The longline fleet

Routine port sampling from longliners at various transshipment ports was carried out as usual by ICCAT. More emphasis is now being placed on biological sampling rather than on the abstraction of logbooks. The port sampling is being expanded to billfishes in accordance with the Program of Enhanced Research for Billfish.

b) The Ghana-based fleet

The contract signed between CRO-Abidjan and ICCAT in early 1986 to finance biological sampling from the Ghanaian surface fleet unloading at the port of Abidjan has been extended into 1987 since the major part of the Ghanaian fleet is still unloading at Abidjan.

There had been significant problems in obtaining results of this sampling. However, the situation has improved and the data up to 1986 have been received. There are still problems in the quality of the data file since there are many errors. These errors are being corrected by the CRO-Dakar at present.

## II. SECRETARIAT DATA PROCESSING

### 1. Facilities

The Micro-Vax II with the VMS operating system is now in the second year of use at the Secretariat while the old INFONET system which ICCAT used for over ten years has gone out of service.

In 1987 no hardware or software has been added due to the lack of funds. Following is a list to be added in the future when funds become available.

Power stabilizer - The electric current is not very well regulated and a fluctuation in voltage occasionally causes a problem for the computer, particular in writing on the disk. The purchase of a power stabilizer is essential to eliminate the problem.

APL language - The SCRS recommended in 1986 to install the APL language.

Console terminal - Due to the lack of terminals, a sophisticated graphics model is located in the computer room as the console and is also used as a work station. Since the working environment is not comfortable in the computer room and the staff has to take turns due to a shortage of terminals (during a scientific meeting the shortage is even more noticeable) and use of the console is restricted to the staff (hence, scientists cannot use the graphics terminal), adding a simple inexpensive monitor terminal as the console would release this sophisticated model to work in normal office conditions and be available for scientists.

Graphics software - The graphics software which came with the original purchase (included in 20/20 spread-sheet software) turned out to be insufficient for scientific use. A more sophisticated graphics system is needed by scientists. Depending on the system, the current matrix printer could serve as output, but if not, a X-Y plotter would be needed.

Laser printer - A laser printer ordered in 1986 was delivered in 1987 and proved to lack certain functions (e.g., proportional spacing with right-margin justification) which were advertised. Therefore, the printer was rejected. The softwae to make the laser printer function as needed become available at the end of 1987, but there were no funds available in the Commission for the purchase of this printer.

2. Data processing

a) Transferring data files to the new system

As the first step, by mid-January, 1987, all the data base was transferred from the INFONET system onto magnetic tapes and two identical copies are being stored in separate locations.

All the data and program files are now being cleaned up and reorganized for the in-house computer system. It is taking much time, as does any major change. As of the writing of this report, the Task I catch base and the Task II catch and effort data have been reorganized and installed in the ICCAT computer system. Some of the size data have been reformatted and installed but transferring all the size data will not be completed until early 1988. Organizing the tagging base, for the first time, is planned to be done after the size data are reorganized.

The major change made in the file format is that the catch and effort records are no longer in a fixed field for each species but only actual catches are entered with species codes. This saves much space, eliminating all "0" catches.

Other major improvements include addition of a code to identify the nature of files (basic file, raised working file, confidential file, etc.) and a code to indicate whether the file has been verified or not.

The catch and effort data files which used to be all mixed up between countries and gears but organized in chronological order of the entries of the data are now re-organized by fisheries, while size data are being organized by species and fisheries.

b) Providing scientists with copies of data files

At the 1986 SCRS meeting, the Secretariat was asked to pay special attention to the delay in meeting the data requests made by the scientists. It was recommended that priority be given to transferring the data base from the INFONET system onto magnetic tapes, house cleaning of files, installation of files in the new computer system and then catching up on the delay in providing copies of data.

In mid-July, when the installation of catch and effort data to our system was complete, the Secretariat made copies of the entire catch and effort data base and made them available to the scientists who requested part of these data. Therefore, there is no significant problem, as regards the catch and effort data. Basic swordfish, billfish, albacore, yellowfin and bigeye size data files have been sent to the laboratories which requested them. There are still some pending requests for other size data, since the work of transferring the files is not yet finished.

c) Data processing done by the Secretariat in 1987

ROUTINE PROCESSING

-- Updating all data bases (Task I, Task II, etc.).

-- Data entry and processing of port sampling statistics.

-- Separation of Task I catch data into major areas (and sometimes into species) using Task II catch and effort and size data.

-- Output of Statistical Bulletin tables.

-- Processing of Task II data received recently (Data Record, Vol. 27).

-- Preparation of species catch tables for SCRS meetings and for SCRS Reports (1986 and 1987).

-- Updating tagging files and output of yearly recovery summary.

-- Creation and distribution of tapes, upon request, for member countries.

SPECIAL PROCESSING (See Sections I and III)

-- Reformatting of all old files in a new format designed for the Micro-Vax system. Storage is on magnetic tape. Only the files to be processed are loaded onto disk and then they are restored on tape.

-- Processing of bluefin data (up to 1986 for the West Atlantic and 1985 for the East Atlantic and Mediterranean. See also Document SCRS/87/19.)

-- Comparison of tuna catches between the ICCAT data base and the FAO base.

-- Creation of the swordfish data base for the entire Atlantic since 1970 up to the most current years.

-- Preparation of data files for the Working Group on Juvenile Multispecies Statistics

-- Developing new species tables by size for bluefin.

-- Processing size data received from Venezuela.

-- Conversion of programs developed in the INFONET system to the Micro-Vax system.

3. Future program of the data base

In this second year, the Commission's computer is functioning very well. As the staff is acquiring more experience with the system, efficiency has been increasing and much more work has been achieved this year than when we had a contract with INFONET. It is expected that once all the files have been installed with the new format and organization (expected by the end of 1987), the routine work as well as responses to data requests will be made very promptly. The tag files will also be completed in 1988.

The Secretariat is also trying to obtain analytical programs for population studies from various laboratories. Some of these programs have been installed into the system. These efforts will be continued.

The policy of using the computer at the scientific meeting was established in 1986 SCRS, as follows:

a) Scientists interested in using the Commission's computer during the SCRS sessions are invited to send the programs they wish to use to the Secretariat in advance of the meeting.

b) Scientists should let the Secretariat know in advance the amount of disk storage they need for their data files.

c) Scientists wishing to run a program on the ICCAT computer during the SCRS sessions are welcome to do so. However, these runs will have to be done by the scientists themselves.

d) In order to facilitate use of the ICCAT computer, the Secretariat is planning to prepare a users' manual, possibly in 1988.

## III. SPECIAL ACTIVITIES BY THE SECRETARIAT

### 1. Data updating and processing for the Bluefin Working Group

In September, 1987, the Secretariat reviewed the bluefin catch-by-size data base. All the data in the base were updated using the new catch and size data (where available). The procedures adopted for the updating of the bluefin base are reported in SCRS/87/19.

### 2. Creation of swordfish data base

Since the Swordfish Workshop is to be held in 1987, the Secretariat has kept in very close contact with the Convener, Mr. J. C. Rey, and proposed a working plan in February, 1987, to prepare the swordfish data base to be used at the Workshop. Unfortunately, responses by the pertinent scientists were very slow and it was only in August that the area by which the data are to be compiled was agreed upon among the group of scientists.

The U.S., Spain and Japan promised to prepare the catch-by-size files for their respective fisheries. However, none of the other countries have

fulfilled their obligations. In mid-September, the Workshop Convener visited the Secretariat for one week to review the data base. As there are very few size data in the base, since the length-weight relationships are very complicated, and since Japanese and U.S. data were not received before the Swordfish Workshop, the Secretariat pulled out all the size information into one file and listed Task I catch data with the corresponding size data. This list is presented in SCRS/87/17 together with suggested data substitutions and raising procedures.

3. Working Group on Juvenile Multi-species Statistics

In response to the proposal and decision made at the last SCRS meeting to hold a meeting on juvenile multi-species statistics, the Secretariat proposed a working plan in collaboration with Mr. M. Mensah (Ghana) who was nominated by the SCRS Chairman as Convener of the Group. FIS and Spanish data were prepared by the "Centre de Recherches Océanographiques de Dakar-Thiaroye" (CRODT), while most of the other data files were provided by the Secretariat.

The Working Group on Juvenile Multi-species Statistics met on June 1-5, 1987, in Dakar, Senegal, at the invitation of the CRODT. At the meeting, the Assistant Executive Secretary served as rapporteur and the ICCAT Systems Analyst carried out almost all the data processing required by the Group. The Report was finalized and distributed by the Secretariat, and is presented as SCRS/87/8.

4. Tuna data comparison between ICCAT and FAO bases

As previously reported, a comparative study between the ICCAT data base and the FAO data base was begun in 1985. This work has continued and in 1987, ICCAT provided new comparison computer runs. Most of the significant discrepancies which existed previously between the two bases have been removed except those for FIS and U.S. data.

A small meeting to discuss the discrepancies found in U.S. data between the two bases was held among FAO, ICCAT and U.S. scientists during the Ad-Hoc Consultation of Global Tuna Statistics, May, 1987, La Jolla, California. The sources of the discrepancies were discovered and corrective measures are presently being taken by the U.S.

5. Coordination of the Program of Enhanced Research for Billfish

The Secretariat has been involved in developing the Program Plan and coordinating and administering the Program activities in collaboration with the Program Coordinator. A detailed report is presented as COM-SCRS/87/14.

6. Coordination of the Yellowfin Year Program

The Secretariat continued to administer the Program funds and also to facilitate research activities in various areas, particularly in the west Atlantic.

The Leaders of the four Activity Teams of the Yellowfin Year Program met in Dakar on June 3, taking advantage of their presence at the meeting of the Working Group of Juvenile Multi-species Statistics. All the activities were reviewed and future plans were slightly modified according to the current situation. The report is presented as SCRS/87/7.

### 7. Venezuela sampling data

See Section I-2 above.

### 8. Biostatistical work

Since the departure of the biostatistician, Mr. J. P. Wise, from the Secretariat, no attempt has been made to fill the position, mostly due to the shortage of funds. No new biostatistical reviews were attempted this year but routine biostatistical work has been continued by the current staff.

## IV. MEETINGS AND COLLABORATION WITH OTHER INTERNATIONAL ORGANIZATIONS

These items are generally reported in detail in the "Administrative Report". However, there are a few items worth mentioning in this report as they are directly involved with tuna statistics and research.

### 1. Coordinating Working Party on Atlantic Fishery Statistics (CWP)

The Thirteenth Session of the CWP was held on February 11-18, 1987, at the FAO Headquarters in Rome. ICCAT, which is one of the principal members of the CWP, was represented by the Assistant Executive Secretary. The report of the meeting is presented as SCRS/87/12. The focus of the meeting was on the usefulness of the STATLANT form to report statistics and how to eliminate discrepancies in the data bases between agencies.

It was recognized that the discrepancies in the data base have been greatly reduced between ICCAT and FAO on tunas and in general between EUROSTAT (EEC statistics) and FAO. But there are still many discrepancies with other agencies that would require tri-party effort and frequent meetings between agencies.

### 2. Ad-Hoc Consultation on Global Tuna Statistics (CWP-TUNA)

After the first meeting of the Inter-Agency Consultation was made in December, 1985, in Colombo at the initiative of ICCAT and FAO, the second session was scheduled in Colombo for December, 1986. However, the second meeting was canceled due to difficulties in bringing together all the pertinent regional agencies.

The second Ad-Hoc Consultation Meeting was rescheduled and held at the NMFS Southwest Fishery Center in La Jolla, California, U.S.A., on May 21 and 22, 1987, immediately following the Lake Arrowhead Tuna Conference. All the world regional agencies concerned with tuna statistics attended the session, including IATTC, ICCAT, IPTP, SPC, FFA and FAO. ICCAT was represented by the Assistant Executive Secretary (P. M. Miyake) who also served as Chairman of the Consultation and the Convener of the Sub-Committee on Statistics (R. Conser).

The Group reviewed the progress made along with the recommendations made at its first meeting held in Colombo, Sri Lanka (December, 1985). It was recognized that the world tuna statistics in the FAO base have been improved to a great extent through the assistance of the regional agencies, particularly in the Atlantic, Indian and eastern Pacific Oceans. However, there are still some difficulties in obtaining adequate data from the central and western Pacific.

The Group reconfirmed its previous recommendations, i.e., improvement of world tuna statistics, development of a data base of world tuna fishing boats (individual boat names with specifications) (see SCRS/87/10), collaboration between agencies for adopting common statistical systems, etc. Formalizing the mechanism of inter-agency consultation meetings was also recommended. A proposal was made to change the English name for Euthynnus alletteratus, and this would require an ICCAT decision (SCRS/87/9). The Group's Report is presented as COM-SCRS/87/16.

## V. PUBLICATIONS AND DISSEMINATION OF INFORMATION

Following the decision made by the SCRS at its 1986 meeting, a new format was adopted for presenting data in the Data Record (from Vol. 27). The adoption of the new format resulted in a reduction of the size of the publication to about one third, representing great savings in preparation, printing, and mailing time. Following is a list of the publications issued in 1987 as of the writing of this report.

-- Report for Biennial Period, 1986-87 (Part I), 1986 - (June)

This year all the printing was done at the Secretariat. Unlimited distribution.

-- Statistical Bulletin, Vol. 16 (Final) - (May)

This volume contains statistics up to 1985; unlimited distribution. Some copies are still available on request.

-- Statistical Bulletin, Vol. 17 (Preliminary) - (September)

This volume contains statistics up to 1986; distribution is limited to the scientists directly involved in ICCAT work.

-- Collective Volume of Scientific Papers, Vol. XXVI (Nos. 1 & 2) - (April)

This volume contains 1986 SCRS papers; distribution is limited to the scientists directly involved in ICCAT work.

-- Data Record, Vol. 27 (July)

Distribution is limited to the scientists directly involved in ICCAT work.

# CHAPTER II
# Record of Meetings

**PROCEEDINGS**
**OF THE TENTH REGULAR MEETING**
**OF THE COMMISSION**
(Azores, Portugal, November 18-24, 1987)

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## OPENING PLENARY SESSION
November 18, 1987

### Item 1. OPENING OF THE MEETING

1.1 The Tenth Regular Meeting of the Commission was held at the Hotel Bahia Palace (São Miguel Island, Azores) under the chairmanship of Mr. C. J. Blondin (U.S.A.). Mr. Blondin presented the people at the head table including Dr. A. Ribeiro Lima, the Regional Secretary of Agriculture and Fisheries of Azores, Mr. J. Boavida, the Second Vice-Chairman of the Commission, Mrs. P. García Doñoro, Chairman of the Standing Committee on Finance and Administration (STACFAD), Mr. A. González-Garcés, the Chairman of the Standing Committee on Research and Statistics (SCRS), Dr. O. Rodríguez Martín, Executive Secretary of the Commission and Dr. P. M. Miyake, the Assistant Executive Secretary.

1.2 In his opening address Dr. Ribeiro Lima, the Regional Secretary Of Agriculture and Fisheries of the Azores, stressed his country's interest in

the Commission's work. He recognized the prestige this Commission has attained in the world fisheries community and the importance of the work carried out by the scientific committee. He noted that a solid scientific base is absolutely necessary for effective fisheries development. Proof of the islands' profound interest in fisheries is demonstrated by their annual "Week of Fisheries" at which scientists, industry people, and fishermen from all over the world participate.

1.3 Dr. Lima noted that the five principal tuna species are present in Azorian waters at various times of the year, namely bigeye, skipjack, albacore, swordfish and billfish. He added that an experimental swordfish fishery was initiated in 1985 and that the fishery is expanding and catches of this species are reaching important levels. He explained that the sport fishery is expanding, especially for billfish, in the summer months. The Regional Secretary welcomes all the delegates to the islands and wished them a successful meeting. Dr. Lima's speech is attached as Annex 4.

1.4 In his opening address, the Commission Chairman, Mr. C. J. Blondin, also welcomed the delegates to the Tenth Regular Meeting of the Commission and highlighted ICCAT's development in scientific research and statistics and the Commission's ability and determination to develop effective management regimes, as evidenced by regulations in effect for yellowfin, bigeye and bluefin tuna. He noted that such actions were made possible by the work of the SCRS. Mr. Blondin cited specific ICCAT research programs, such as the Skipjack Program, Bigeye Day, the on-going Yellowfin Program and an ambitious research program for Atlantic billfish. He added that ICCAT was also intensifying its research efforts on swordfish, as evidenced by the recent Swordfish Workshop. He emphasized the analytical capability of the Commission brought about by the addition of a microvax computer which enables the scientists to conduct on-site scientific analysis. In spite of our advances, the Commission Chairman reiterated the need for continuing research on tunas.

1.5 Mr. Blondin pointed out that the Commission's future is clouded by its financial difficulties and noted that a program of austerity has been implemented where possible. He added, however, that the commissioners must consider both short-term and long-term solutions to these serious problems, including possible changes to the Convention, if the continued viability of the organization is to be ensured.

1.6 On behalf of all the member country delegations, the Commission Chairman expressed his appreciation to the Government of Portugal for hosting our meeting once again, to the Executive Secretary and the Assistant Executive Secretary for their combined efforts in planning this meeting and for their work during the course of the meeting.

1.7 In declaring the Tenth Regular Meeting of the Commission officially open, Mr. Blondin welcomed all the delegates and observers and wished all present a successful meeting. He especially welcomed Guinea Equatorial, which became the twenty-third member country of the Commission within the last year. The Chairman's opening address is attached as Annex 5.

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

2.1 The head delegate of each member country introduced his respective delegation. The List of Participants is attached as Annex 2.

2.2 The Commission reviewed the Tentative Agenda which had been distributed 90 days prior to the opening of the meeting. The Commission adopted the Tentative Agenda attached herewith as Annex 1.

2.3 It was decided that Agenda Items 4-19, 28, 30, 31 and 32 would be referred to the Standing Committee on Finance and Administration (STACFAD). Items 26 and 29 were referred to the Infractions Committee. No subsidiary bodies were appointed for this meeting. The List of Documents presented to the Commission is attached as Annex 3.

2.4 In referring Agenda Item 19, concerning the study of the bases for calculating the member country contributions, to STACFAD, the Chairman noted that this matter could be studied by the financial committee alone or it could establish an ad hoc group to continue its study in depth.

Item 3. ADMISSION OF OBSERVERS

3.1 The observers, representing several countries and international organizations, introduced themselves. All the observers were admitted and welcomed by the Chairman (see Annex 2, List of Participants).

SECOND PLENARY SESSION
November 18-19, 1987

Item 21. REPORT OF THE STANDING COMMITTEE ON RESEARCH AND STATISTICS (SCRS)

21.1 Mr. González-Garcés, Chairman of the SCRS, presented his Committee's Report to the Commission's Second Plenary Session and summarized the scientific findings. In 1987, for the first time, the SCRS met separately from the Commission in terms of place and time. The SCRS meeting was held on October 14-22, 1987, at the Hotel Velázquez, in Madrid, Spain.

21.2 The Chairman reported that this year a "Swordfish Workshop" was held prior to the SCRS meeting and scientists made good progress in gathering all the data available on this species and successfully created a catch at size table for total Atlantic swordfish. They also discussed the relationship between various measurements and agreed upon the area and time in which the data are summarized and then agreed upon the growth curve to obtain the catch at age table. Although the progress was remarkable, the Workshop could not complete the work and requested holding another meeting in 1988 to complete its assignments.

21.3 Mr. González Garcés reported SCRS conclusions regarding changes in fishing patterns, stock structure, stock assessments, and evaluations of

the effect of current regulations. These subjects are reported in detail under Agenda Item 9 of the Committee's Report. Agenda Item 9 also includes various Committee recommendations to the Commission regarding statistics, research and management.

21.4 The Chairman drew the Commission's attention to the Yellowfin Year Program and reported that this Program was ending and only lacked analyzing all the new data, together with past data. For this purpose, the SCRS requested holding a data preparatory meeting at Dakar, in June, 1988, and a final analytical meeting in early 1989 and requested that $25,000 be reserved from the unused positive balance of the Program for this purpose.

21.5 The Commission's attention was also directed to the "Program of Enhanced Research for Billfish" (COM/87/14). The SCRS Chairman briefly outlined the Program Plan agreed upon by the Committee and the progress made so far.

21.6 He also called the attention of the Commission to the request made by the Committee to upgrade the ICCAT computer to better facilitate on-the-spot work of the scientists during the scientific sessions, by expanding the memory capacity and adding some accessories.

21.7 The Committee also recommended holding its meeting in early November and starting the sessions in the middle of the week and ending at the end of the following week. There were opinions in favor of and against separating the SCRS from the Commission meetings.

21.8 Mr. Blondin thanked the Chairman of SCRS for the work carried out by his Committee, especially for the thoroughness of the presentation. He also commended the excellent progress made in the scientific field by members of the SCRS.

21.9 The delegate of Portugal suggested that a glossary of technical terms used in the report be added to help the administrators to understand it better. The SCRS Chairman responded that this could easily be done.

21.10 The observer from Mexico recognized the importance of the activities of research and management of tunas carried out by the Commission. Taking into account the policies of the new Law of the Sea, his government sees the management of fishery resources located in its Exclusive Economic Zone as a primary objective. He observed that some species of tunas regulated by ICCAT register levels of over-exploitation by the fishing effort of some of the member countries, which led the Commission to establish regulatory measures. Mexico follows a policy of rational exploitation and conservation of resources of concern to ICCAT, such as billfish. For eleven years, within the framework of Mexican-United States research in the Gulf, information on species of common interest has been exchanged.

21.11 The delegate of Japan noted that in the Enhanced Billfish Research Program Plan (COM/87/14) there are plans for placing observers on board Japanese longliners. As this conflicts with the operation of the commercial fishing activities (economic loss as well as some physical risk), Japan wished to express its reservations on this part of the program. The extended discussion of this matter was referred to Panel 4.

21.12 The delegate of Spain expressed her regret that the Spanish national report was not included in Spanish version of the report distributed at the SCRS and later added in loose-leaf form. The delegate also commented that the influence of new non-selective fishing gears on the north stock of albacore should be studied and it is necessary to continue studies on swordfish which will permit better knowledge of this resource; the Billfish Program should be carefully studied in terms of priorities, particularly since there are many research items waiting to be carried out; and that the request to upgrade the computer should be studied by the Standing Committee on Finance and Administration.

21.13 The Chairman observed that there are advantages to holding the SCRS meeting separate from the Commission as the Commissioners have time to study the SCRS report in detail, but that there are also disadvantages of requiring some of their scientists to travel twice a year. He referred the discussion to the later session under another agenda item.

21.14 The Commission adopted the Report together with the recommendations contained therein, pending a later decision by the Commission on some of the recommendations which have some financial and/or regulatory implications. The SCRS Report is attached as Annex 10.

## FINAL PLENARY SESSION
November 23, 1987

### Item 23. REPORT OF PANELS 1-4

23.1 Dr. L. Koffi (Côte d'Ivoire) for Panel 1, Mr. S. J. Makiadi Lopes (Angola) for Panel 2. Mr. M. Morimoto (Japan) for Panel 3, and Mr. A. Kaluzhny (U.S.S.R.) for Panel 4 presented their respective Panel Reports to the Commission and highlighted the recommendations contained therein. The Report of Panels 1-4 is attached as Annex 6.

23.2 There were no changes proposed by Panel 1 for the current size regulation in effect for yellowfin and bigeye. This Panel reiterated the SCRS recommendation to hold two working group meetings to finalize the Yellowfin Year Program, one to prepare the data and the other to finalize the analyses and present the results of the Program. Panel 2 proposed that the current management measures for bluefin tuna in effect for 1987 be maintained in 1988 for the west Atlantic stocks and that the regulations for the east Atlantic be unchanged. The Commission noted that Panel 3 did not suggest any conservation measures for 1988. Panel 4 reiterated the SCRS recommendation to hold a swordfish workshop in 1988 to update the data base and complete the stock assessment. It also supported the Program for Enhanced Research on Billfish in order to provide more detailed catch and effort statistics, to expand the ICCAT tagging program to include billfish, and to assist in collecting data for age and growth studies.

Item 24. REPORT OF THE INFRACTIONS COMMITTEE

24.1 Mr. B. García Moreno (Cuba), Chairman of the Infractions Committee, presented the report of the Committee to the Commission. The report dealt with implementation of current regulations and inspections carried out during the year by member countries. The Report was adopted and is attached as Annex 7.

ITEM 22. REPORT OF THE STANDING COMMITTEE ON FINANCE AND ADMINISTRATION (STACFAD)

22.1 The report of the meeting of the Standing Committee on Finance and Administration (STACFAD) was presented by its Chairman, Ms. P. García Doñoro (Spain).

22.2 The Commission approved the STACFAD Report and endorsed all the recommendations (including the 1988-1989 Budgets) contained therein. The adopted STACFAD Report is attached as Annex 8.

22.3 The Commission noted that the following Agenda Items referred to the STACFAD were dealt with and completed by the Committee and endorsed all the recommendations concerning them:

Item 4. Commission and Panel membership
Item 5. Ratification of the Protocol to the Convention
Item 6. Coordination of research
Item 7. Relations with other organizations
Item 8. Commission publications
Item 9. Meetings during the year
Item 10. Other administrative matters
Item 11. Auditor's Report - 1986
Item 12. Financial status of the second half of the biennial budget (1987)
Item 13. Financial status of the Yellowfin Year Program
Item 14. Trust Fund for the Enhanced Billfish Research Program
Item 15. Pending contributions of the member countries
Item 16. Working Capital Fund
Item 17. Budget for the biennial period 1988-1989
Item 18. Member country contributions to the 1988-1989 Budget
Item 28. Recommendations for research and statistics
Item 30. Date and place of next meeting of the Council or special meeting of the Commission
Item 31. Items to be considered by the Council at its next meeting
Item 32. Date and place of the next regular meeting of the Commission

Item 19. STUDY OF THE BASES FOR CALCULATING THE CONTRIBUTIONS OF THE MEMBER COUNTRIES

19.1 Côte d'Ivoire presented a proposal for changing the basis for calculating the member country contributions in order to try to resolve the financial crisis facing ICCAT. This proposal includes making a distinction between industrialized countries and developing countries and to adopt a system for calculating the contributions which would substantially reduce

the proportion of the developing countries. This proposal is attached as Annex 9.

19.2 Recognizing that this proposal requires in-depth study as it could involve an amendment to the Convention, the Commission Chairman suggested that a working group be formed to study this proposal and report to the STACFAD, thus allowing the delegates time to consult with their governments and to come to the meeting with instructions.

19.3 The delegate from Korea commented that his delegation refrains from taking any position on the substance of the proposal. He went on to say that in view of the current financial difficulties discussed during the last several days, the proposal of Côte d'Ivoire is noteworthy. However, his delegation is obliged to express its preliminary observation. Firstly, the proposal simply categorizes member countries into two groups, namely, industrialized countries and developing countries. Quoting one sentence from the proposal, the Korean delegate said "an international organization should be a platform for international cooperation where the dignity of some and the interests of others must be respected". Likewise the interests of some other possible category of member countries to which he believes his country might belong, must also be given due attention. Secondly, current financial problems call for urgent actions to be taken by the member countries which have outstanding contributions rather than a change in the formula for calculating contributions. Thirdly, it must be taken into account that the proposal has been distributed only during the meeting. There has been little time to make an in-depth study of the proposal. He felt it appropriate to defer consideration of this issue until the next Commission meeting. Finally, any issue which may result in an amendment to the Convention is a primary and grave concern for all member countries. The delegate of Korea would like to make it clear that his delegation is not in favor of a working group unless this working party is so set up as to ensure participation of all member countries.

19.4 The delegate from Japan noted that his country does not agree that a working group meeting should be held to discuss the premise of restructuring the contributions to solve current financial problems. His delegation felt that there are many alternatives for improving the current financial situation and that increased efforts must be made to collect contributions from countries in arrears as was recommended last year. It does not seem realistic to move at this time to amend Article X of the Convention to solve financial difficulties as this will take a long time and our problem is immediate. Also, it does not seem fair or acceptable to the Japanese delegation to increase the financial burden on countries who have previously paid contributions faithfully.

19.5 The delegate of Brazil agreed with the idea of forming a working group and suggested that it meet during the next Commission meeting.

19.6 The French delegation recognized that the document has interesting positive elements, of a generous and cooperative nature. Without completely supporting the Ivorian conclusions, the French delegation considered that the document is a good basis for reflection and supported the Brazilian delegation which suggested forming a working group for the next meeting.

19.7 The observer from the EEC commented that the EEC, with an open mind in view of its future participation as a full member of ICCAT, would examine the idea developed by Côte d'Ivoire of making a distinction between industrialized and developing countries, to see how this is done in other organizations as an example. However, the EEC feels that we cannot disregard the Law of the Sea Convention, nor the nature of fishery organizations for which contributions are partly based on the fishing activities carried out by their members. The EEC is ready to contribute positively to the work of ICCAT on the Ivorian proposal.

19.8 The delegate from Spain noted the importance of the proposal, although Spain does not agree on all points. Due to the short time available, the Spanish delegate felt the proposal should be studied further, either before or during the next meeting of the Commission, and that Spain would like to be a member of the working group.

19.9 It was agreed to place this matter on the Commission and STACFAD agendas for next year.

## Item 20. REPORT OF THE FIFTH SPECIAL MEETING OF THE COMMISSION

20.1 The Commission reviewed the report of the Fifth Special Meeting of the Commission as presented in the Report for Biennial Period, 1986-87 (Part I).

## Item 25. REPORTS OF SUBSIDIARY BODIES APPOINTED BY THE COMMISSION FOR THE MEETING

25.1 No subsidiary bodies were appointed for this meeting.

## Item 26. REVIEW OF THE IMPLEMENTATION OF REGULATIONS RECOMMENDED BY THE COMMISSION REGARDING YELLOWFIN, BIGEYE, AND BLUEFIN TUNAS

26.1 The report of the Infractions Committee (Annex 7) was referred to by the Commission regarding the regulations in effect on these species.

## Item 27. OTHER POSSIBLE REGULATORY MEASURES TO BE CONSIDERED

27.1 The recommendations for tuna management had been dealt with thoroughly by Panels 1-4 (see Annex 6) and no additional recommendations were made other than those already in effect.

## Item 29. PORT INSPECTION

29.1 This matter was dealt with by the Infractions Committee and reported in Annex 7.

Item 30. DATE AND PLACE OF THE NEXT MEETING OF THE COUNCIL OR SPECIAL MEETING OF THE COMMISSION

30.1 The Commission reiterated the STACFAD recommendation that a special meeting of the Commission be held in Madrid in 1988 for a duration of three weekdays (i.e., Monday to Wednesday). The Commission agreed with the dates recommended by the STACFAD, i.e., November 2 to 10, 1988, for the SCRS Meeting and November 14 to 16 for the Commission Meeting.

Item 33. ELECTION OF THE CHAIRMAN OF THE COMMISSION

33.1 Côte d'Ivoire nominated the current First Vice-Chairman, Mr. S. J. Makiadi Lopes (Angola), as Chairman of the Commission. Cuba seconded the nomination and Mr. Makiadi was unanimously elected Commission Chairman.

33.2 In accepting the Chairmanship, Mr. Makiadi expressed his appreciation at being elected. He expressed his satisfaction in working for an organization in which there have been such advances in research on stock assessments. He noted that the financial crisis is alarming and that he will make every effort to solve the problem. Many countries are interested in ICCAT's work and it is essential to have those countries in ICCAT in order to manage jointly the tuna stocks within the ICCAT scheme.

Item 34. ELECTION OF THE VICE-CHAIRMEN OF THE COMMISSION

34.1 Spain proposed Mr. A. Ribeiro Lima (Portugal) as the First Vice-Chairman. Canada seconded the nomination and Mr. Lima was unanimously elected First Vice-Chairman.

34.2 The U.S.A. nominated Mr. M. Morimoto of Japan as Second Vice-Chairman. Portugal seconded the nomination and Mr. Morimoto was unanimously elected Second Vice-Chairman.

Item 35. ELECTION OF COUNCIL MEMBERS

35.1 As the Council will not meet next year, no election of members was held.

Item 36. OTHER MATTERS

36.1 The delegate of Japan expressed his country's concern on ICCAT's policy and procedures for admitting observers. He felt it is appropriate to accept observers interested in the work of the Commission and those prepared to contribute towards ICCAT's management goals as spelled out in the Convention. However, Japan felt that ICCAT should look more closely at our current procedures for admitting observers. Unfortunately, some other international commissions have experienced destructive influences from individuals or groups whose goals are not rational management of marine resources.

36.2 Japan would like to ask the Secretariat what procedures are currently used for admitting observers to the Commission and SCRS meetings. It also would like to hear the views of other countries on this issue. Japan would like to request that the Secretariat study this matter during the coming year and prepare guidelines and recommendations to be studied next year at the Special Meeting of the Commission. In regard to this work, Japan requests that the Secretariat report its progress to member countries at appropriate times during the year so as to allow member countries the ability to fully consider a proposal for guidelines and recommendations well in advance of the next meeting.

36.3 Portugal agreed with Japan's proposal, noting that this is a delicate issue and should be examined at the next meeting. Canada wished to distinguish the observers representing governments from non-governmental organizations.

36.4 France proposes that contributions could be set for observers to the Commission meetings on a voluntary basis (according to Article VIII of the Convention) to be paid to the Commission. This contribution should not be less than $1,000 per person. France suggested that before the next Commission meeting, the Executive Secretary should inform observers of this voluntary contribution and asks that the Executive Secretary report on the contributions received at each meeting.

36.5 Spain supported the French proposal for voluntary contributions from observers. Korea had reservations on observers being required to pay fees but agreed with the proposal of voluntary contributions. This proposal was accepted by the Commission and the Executive Secretary was instructed to inform observers in advance and to report to the Commission of the results.

Item 37. ADOPTION OF REPORT

37.1 The Proceedings of the Opening and Second Plenary Sessions were reviewed rapidly. It was decided to approve the Proceedings by mail as soon as practicable after the meeting.

Item 38. ADJOURNMENT

38.1 The Commission Chairman thanked the chairmen of all the Committees and Panels for their excellent leadership and collaboration. He also thanked the Secretariat staff for its efficiency during the meeting and throughout the year.

38.2 Sincere appreciation was expressed by Commission members for the outstanding work and enthusiasm shown by Mr. C. Blondin throughout the years he has worked with ICCAT and especially during his term as Commission Chairman.

38.3 The meeting was adjourned.

# COMMISSION AGENDA

**Procedure of the meeting**

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

**Administration**

4. Commission and Panel membership
5. Ratification of the Protocol to the Convention
6. Coordination of research
7. Relations with other organizations
8. Commission publications
9. Meetings during the year
10. Other administrative matters

**Finance**

11. Auditor's Report - 1986
12. Financial status of the second half of the biennial budget (1987)
13. Financial status of the Yellowfin Year Program
14. Trust Fund for the Enhanced Billfish Research Program
15. Pending contributions of the member countries
16. Working Capital Fund
17. Budget for the biennial period 1988-1989
18. Member country contributions to the 1988-1989 Budget
19. Study of the bases for calculating the contributions of the member countries

**Reports to the Commission**

20. Report of the Fifth Special Meeting of the Commission
21. Report of the Standing Committee on Research and Statistics (SCRS)
22. Report of the Standing Committee on Finance and Administration (STACFAD)
23. Reports of Panels 1 - 4
24. Report of the Infractions Committee
25. Reports of subsidiary bodies appointed by the Commission for the meeting

Measures for the conservation of stocks

26. Review of the implementation of regulations recommended by the Commission regarding yellowfin, bigeye, and bluefin tunas
27. Other possible regulatory measures to be considered
28. Recommendations for research and statistics
29. Port Inspection

Other matters

30. Date and place of the next meeting of the Council or special meeting of the Commission
31. Items to be considered by the Council at its next meeting
32. Date and place of the next regular meeting of the Commission
33. Election of Commission Chairman
34. Election of the Vice-Chairmen of the Commission
35. Election of Council members
36. Other matters
37. Adoption of Report

Adjournment

38. Adjournment

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*Annex 3*

## LIST OF DOCUMENTS
## (1987 Commission Meeting)

| | | |
|---|---|---|
| COM/87/ | 1 | Tentative Agenda |
| | 2 | Annotated Tentative Agenda |
| | 3 | Tentative Time Schedule |
| | 4 | Tentative Agenda of the Standing Committee on Finance and Administration (STACFAD) |
| | 5 | Tentative Agenda for Panels 1-4 |
| | 6 | Tentative Agenda of the Infractions Committee |
| | 7 | Panels |
| | 8 | Administrative Report 1987 |
| | 9 | Financial Report |
| | 10 | Auditor's Report 1986 |
| | 11 | Estimated Regular Budget 1988-89 |
| | 12 | Finances of the Commission |
| | 13 | Secretariat Report on Statistics and Coordination of Research |
| | 14 | Program Plan for the Enhanced Billfish Research Program for 1987 |
| | 15 | Report of the Swordfish Workshop - Madrid, October 6-13, 1987 |
| | 16 | Report of the Ad Hoc Consultation on Global Tuna Statistics - La Jolla, California (U.S.A.), May 21-22, 1987 |
| | 17 | Status of the Proposals Adopted by the Commission for the Conservation of Yellowfin, Bigeye and Bluefin Tuna Stocks |
| | 18 | Port Inspection |
| | 19 | Replenishing the Working Capital Fund |
| | 20 | Report of the 1987 Meeting of the Standing Committee on Research and Statistics (SCRS) |

# OPENING ADDRESS BY MR. A. RIBEIRO LIMA, REGIONAL SECRETARY OF AGRICULTURE AND FISHERIES OF THE AZORES

Ladies and Gentlemen:

Welcome to Portugal, welcome to the Azores.

As head commissioner of my country's delegation, it is with great satisfaction that I welcome all of the participants to this meeting of ICCAT.

In 1965, in an address in the 13th Session of FAO, in Rome, the Director General was authorized to convoke a conference of plenipotentiaries to draw up an international convention for the conservation of Atlantic tunas and tuna-like species. Thus, ICCAT was created.

Azores was interested in having the Commission hold its Tenth Regular Meeting in these islands for the following reasons:

--it deals with a commission of enormous prestige in world fisheries;

--delegations from the majority of the member countries, comprised of persons with high positions in their respective national fisheries, attend the meetings. Also attending, as observers, are persons with high positions in non-member countries, which follow with interest the activities of the Commission;

--we recognize the in-depth research carried out by the Standing Committee on Research and Statistics (SCRS), without which our knowledge of tunas in the Atlantic would be much inferior;

--finally, ICCAT is an organization which is essential in the context of resource management of tunas and tuna-like species in the Atlantic.

That is why Portugal is interested in the work of this organization.

In the Azores, we have a deep involvement in the development of fisheries, and we are convinced that it is essential to rely on a solid scientific base to program the plans for fishery development in our islands. A proof of our interest in this is the annual "Week of Fisheries", meetings attended by scientists from very different countries, some of whom are linked to ICCAT activities. Also attending these meetings are industry people, fishermen, businessmen, indicating their clear interest in these technical and scientific meetings.

The economic development in the Azores is fundamentally based on its primary sector, assuming an undeniably importance in the sub-sector of fisheries and, within this sub-sector, the tuna fisheries.

Azorian waters provide good conditions for the presence of tunas and five main tunas species come here.

From bigeye which visits us at the beginning of each season to Atlantic bonito which stay here during the summer, to sailfish which also appears here in summer and autumn, all these species are a large and essential source of income for our economy.

Also, for its almost constant occurrence in our waters, I must mention the growing importance of swordfish as well as different species of billfish.

With respect to swordfish, we began an experimental fishery in 1985, whose excellent results motivated the development of a new fishery. This year we were able to reach a good catch level which clearly continues to expand.

I would also like to call attention to the fact that we find ourselves in a period of expansion in sport fishing, especially on billfish, during the summer months. The increase in the number of boats specially equipped for sport fishing on these species is a clear indication of the growing interest in these fisheries in our waters, where records are set every year.

This brief information is just to give you an idea of these nine islands scattered in the middle of the Atlantic.

Thank you for your presence. We sincerely hope you have a successful meeting.

I end with another brief wish: Return to the Azores. We are here to make your stay a happy one.

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

Distinguished delegates, fellow commissioners, observers, guests, ladies and gentlemen:

My personal association with the International Commission for the Conservation of Atlantic Tunas has spanned a period of 13 years. During the last four, I have had the honor and distinction of presiding over an international fisheries management and research body of increasing stature and significance. As Chairman, I have enjoyed close working relationships with many of you. I have benefited from and been guided by your expertise and the wisdom of your counsel. As we have addressed issues from the various perspectives, my horizons have broadened and my understanding deepened.

The Commission, whose member governments now number 23, has compiled a record of addressing difficult problems and thorny issues with resolve and dedication. In the process, the Commission has demonstrated its ability and determination to develop the management regimes necessary to provide effective programs of international conservation as evidence by the regulations now in place for yellowfin, bluefin and bigeye tunas.

Of particular note were the Commission's actions with regard to North Atlantic bluefin tuna. The Commission began to address declining trends in this stock in the mid-1970's, and the results appear to be well worth the effort. The stock in recent years has shown signs of rebuilding in response to the Commission's restrictive measures. However, in part because the bluefin tuna is a long-lived species, we must remain vigilant in our monitoring of stock trends in order to ensure the stock's complete recovery.

In noting our progress in the development of management regimes, we must pause to consider that our actions were made possible by the work of the Standing Committee on Research and Statistics (SCRS). The SCRS has worked tirelessly to extend our knowledge of the tuna and billfish resources in the Atlantic Ocean and has produced a formidable data base for stock assessment and analysis. Among its past achievements which have provided a strengthened basis for Commission decision-making are the computer data base system, enhanced training and tagging programs, and species specific research efforts such as the International Skipjack Program, Bigeye Day, and the Yellowfin Year Program now in progress. In each of these efforts the SCRS, through international cooperation, has expanded the frontiers of research and provided the world's scientific community with new data. Continuing these efforts, the SCRS has now embarked on an ambitious research program for Atlantic billfish. To date, an inadequate data

base has prevented the SCRS from determining basic biological parameters needed for definitive stock assessment. With the development and recent initiation of the Program Plan of Enhanced Research for Billfish and the commitment of funding from sources outside the Commission, the prospects are bright for eventually producing an adequate data base for guiding future management recommendations.

Likewise, in response to data problems with respect to evaluating the swordfish stocks, the SCRS is intensifying its research efforts and held, in association with its October meeting, a workshop focused on stock assessment, the results of which have been made available to us in the SCRS report.

We continue to improve our capabilities for effective management. With the addition of the Micro-Vax computer for use by the SCRS, we have helped diffuse possible conflicts by providing on-the-spot analysis. The ability to conduct analytical assessments during the SCRS meetings has enabled our scientists to address questions in a timely and effective manner. We look forward to the expansion of this on-site analysis so that our scientists can continue to provide us with the latest and most accurate scientific analysis.

Despite these advances, the opportunity for improvement always exists. Continuing high catches of juvenile yellowfin and bigeye would appear to defy our efforts in this area. Redoubled efforts to acquire accurate statistics on the fisheries taking these species are necessary. In other fisheries as well, particularly those which involve billfish, improvements in reporting are required.

While our short history has been marked by outstanding achievements and increased credibility, our future is somewhat clouded by the financial difficulties in which the Commission is mired. Such difficulties have arisen for a number of reasons, most of which are beyond the Commission's control. A program of austerity implemented where possible by the Executive Secretary without endangering the high quality standards of the Commission has assisted in addressing our dilemma. Nevertheless, it may now be necessary for the commissioners to consider other solutions to the very serious financial problems we face if the continued viability of the organization is to be ensured. The solutions will not be easy, but I urge all delegations to review constructively the short-term and long-term solutions within the powers of the Commission, as well as those solutions that may require changes to the Convention. This is by far the most serious issue to face the Commission and I will seek each delegation's advice concerning our financial problem.

On behalf of all the national delegations, I would like to express our appreciation to the Government of Portugal for once again serving as our host and to the Executive Secretary, Dr. Olegario Rodríguez Martín, the Assistant Executive Secretary, Dr. Peter Miyake, and the Secretariat staff for their collective efforts in preparing for this meeting and those of the SCRS and associated sub-bodies. The detailed planning executed prior to our arrival makes the accomplishment of our work possible.

I look forward to the days ahead as an opportunity to renew old friendships and seal new ones. With the atmosphere of good will in which our deliberations have always taken place, no challenge can be too great, no task insurmountable. It gives me great pleasure to open the Tenth Regular Meeting of the International Commission for the Conservation of Atlantic Tunas.

# REPORTS OF THE MEETINGS OF PANELS 1-4

(Azores, Portugal, November, 1987)

## REPORT OF THE MEETING OF PANEL 1

### 1. OPENING

The meeting was opened by the Chairman, Dr. L. Koffi (Côte d'Ivoire).

### 2. ADOPTION OF AGENDA

The Agenda was adopted without changes (Appendix 1).

### 3. ELECTION OF RAPPORTEUR

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

### 4. REVIEW OF PANEL MEMBERSHIP

There were no changes in Panel membership since the 1986 meeting. Angola, Brazil, Côte d'Ivoire, Cuba, France, Japan, Korea, Portugal, Spain, United States and the U.S.S.R. were present.

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

Mr. A. González-Garcés, SCRS Chairman, summarized the conclusions of the Committee regarding yellowfin and skipjack.

#### 5.a) Yellowfin

Mr. González-Garcés recalled that there are probably two yellowfin stocks in the east and west Atlantic.

Purse seine effort in the west Atlantic has increased recently and has caused a regular increase in catches from 1980 to 1983. Catches are stable since that time. There is still little knowledge on the state of the stock due to the lack of adequate fishery statistics.

In the east Atlantic, the stock has been the subject of numerous analyses by the SCRS during the last fifteen years. Fishing effort on the stock decreased to about half since 1984, following the departure to the Indian Ocean of a large number of French, Ivorian and Spanish purse seiners. Following this sharp reduction in fishing effort, stock abundance which was low in 1982-1984 due to the high fishing effort, has now entered a phase of rapid recovery. This has resulted, since 1985, in a rapid improvement in catches, with nominal effort remaining low.

The detailed fishery statistics submitted by the majority of the countries which exploit this species have allowed for a good analysis of the current state of recovery of the stock. This work will be developed within the framework of the final phase of the Yellowfin Year Program. It is generally considered that the stock may currently be moderately exploited.

5.b) Skipjack

Since 1984, there was a slight decline in skipjack catches by purse seiners in the east Atlantic due to a reduction in effort.

The SCRS, however, noted that this decline in catches is slightly lower than the decrease in nominal effort, most likely due to the partial change in the target species from yellowfin to skipjack.

Baitboat catches in the same area decreased slightly since 1984, probably due to the new statistical procedures implemented by the SCRS in 1987 which led to revising downwards the Tema baitboat skipjack catches.

In the west Atlantic skipjack catches fluctuated without trend between 30,000 and 40,000 MT after 1982.

The exact potential of the skipjack stocks remains difficult to estimate; however, the SCRS feels skipjack catches could be increased in view of the conclusions of the International Skipjack Year Program.

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

### 6.a) Yellowfin

The Panel Chairman, Dr. L. Koffi, examined the current regulations. Studies by the SCRS show that a large number of undersized yellowfin continue to be caught by the purse seine and baitboat fisheries. The potential gains from the strict application of the ICCAT regulation with the current fishery scheme seem to be less important than what could have been observed with the very high fishing effort of 1980-1983. However, the SCRS Chairman noted that the 3.2 kg size limit is still interesting because fishing effort exerted by purse seiners in the Atlantic may be increased at any time, particularly with the return of the boats which are currently operating in the Indian Ocean.

6.b) Skipjack

No management measures seem necessary nor advisable for the present skipjack fisheries, because of the brief period of exploitation of this species and because the potential growth of skipjack is very limited.

## 7. RESEARCH NEEDED TO BE CARRIED OUT

7.a) Yellowfin

The SCRS Chairman presented the current status of the ICCAT Yellowfin Year Program which was proposed by the SCRS and adopted by the Commission in 1985. The Program was the subject two meetings of the team leaders (Dakar, June 1987 and Madrid, October 1987) to assess the research activities and to plan the final phase of the Program. The Program in general has been carried out very well in spite of a certain number of problems, particularly in tagging. The fact that fishing effort has remained at a low level during four years and the stock is reacting positively and rapidly to this decrease in effort, reinforces interest in the Program. The analyses to be made in 1988 and 1989 in the final phase of the Yellowfin Year Program will provide good understanding of the mechanisms of this recovery.

The SCRS recommended holding two working group meetings, one to prepare and pre-analyze the data in July, 1988; the other at the beginning of 1989 to finalize these analyses and the presentation of the results of the Program.

The SCRS estimated that $25,000 are necessary for the final phase of the Program.

The Panel approved these recommendations.

7.b) Skipjack

The Panel reviewed the four SCRS recommendations for improving research and evaluations on the skipjack stocks. These recommendations were approved by the Panel.

## 8. DATE AND PLACE OF NEXT PANEL MEETING

Panel 1 will meet at the same place and at the same time as the next meeting of the Commission.

## 9. ELECTION OF PANEL CHAIRMAN

Côte d'Ivoire was unanimously re-elected Chairman of Panel 1.

10. OTHER MATTERS

No other matters were discussed.

11. ADOPTION OF REPORT

The report was adopted.

12. ADJOURNMENT

The meeting was adjourned.

## REPORT OF THE MEETING OF PANEL 2

1. OPENING

The meeting was called to order by the Commission Chairman, Mr. C. J. Blondin (U.S.A.), in the absence of the Panel Chairman, Morocco. Mr. Blondin asked Mr. S. J. Makiadi Lopes, (Angola), the First Vice-Chairman of the Commission, to chair the Panel for this session. Mr. Makiadi accepted this responsibility and convened the session.

2. ADOPTION OF AGENDA

The Agenda was adopted without changes (Appendix 1).

3. ELECTION OF RAPPORTEUR

Dr. P. M. Miyake was appointed rapporteur.

4. REVIEW OF PANEL MEMBERSHIP

There have been no changes in Panel membership since the 1985 meeting. Canada, France, Japan, Korea, Portugal, Spain, and United States were present.

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

The SCRS Chairman, Mr. A. González-Garcês presented the results of research by the SCRS during 1987 concerning bluefin tuna and north Atlantic albacore.

5.a) Bluefin

The SCRS based its analysis on the same two-stock hypothesis as used previously; that is, one stock in the east and one in the west Atlantic. For the eastern and Mediterranean stock, it appears that the 1982 cohort was very strong and has been reflected in the catch-at-age table since that time.

For the west Atlantic stock, the results of VPA are similar to those generated in the last two years. They all indicated that the spawning stock size has declined sharply since 1970, that recruitment and the juvenile stock size are substantially lower than in 1970, although it is recognized that changes in availability could affect estimates of the size of recent year classes.

5.b) Albacore - north

Only a production model was used to evaluate the state of this stock; the analysis presented to the Committee used Taiwan longline CPUE and not the surface fishery CPUE as in previous years. This analysis reached a different conclusion from that presented in previous years: the stock was exploited up to 1983 at a level of effort superior to that corresponding to MSY; the present catch, estimated this year at only 48-51,000 MT, is near the MSY. The SCRS considered that the validity of these analyses should be re-evaluated by using the data of all the fisheries and better adapted alternative models, such as the analytic model.

Spain noted that the north albacore stock has been stable for the last 30 years and that the introduction of new gears (e.g., pelagic trawls and drifting gillnet) may break this equilibrium state of the stock and have some impact on other species. Also the new gears may increase the gear competition with the traditional fisheries. The delegate from Spain suggested that the Panel recommend careful monitoring of these developing fisheries using the new gears and that information on the number of boats, the forecast increase in the number of boats, size of fish caught, times and areas be submitted to the Commission. There should not be an increment in fishing effort by these gears. The SCRS should study the fisheries and their effects carefully.

France responded that French fishermen are involved in developing these new fisheries. France will provide all the data needed to the Commission. He added that the pelagic trawling fishery was still in an experimental stage and should not cause any concern. The SCRS Chairman promised that when these data become available the SCRS will try to analyze the impact the new fishery would have on the present fishery and on the stock.

6. REVIEW OF POSSIBLE MEASURES FOR THE CONSERVATION OF STOCK

6.a) Bluefin

The SCRS Chairman informed the Panel that no changes in the existing management measures were recommended for east Atlantic bluefin; and the Panel concurred.

For the west Atlantic, this year's analysis indicated that the catch limit of 2,660 MT for next year will not prevent the continuing decline in the spawning stock (age 10+), that good recruitment may be needed to allow the juvenile stock biomass (ages 1-9) to increase again in 1988, and that several years will be needed after a year class is recruited before its size can be reliably assessed.

The delegate of Japan expressed his country's view (Appendix 2) and indicated its disappointment in the inadequacy of the resource evaluation. He commented that the SCRS reported that small-sized bluefin are not as abundant as previously predicted and that the decrease in large fish is not as severe as determined previously because of the change in input parameters. It is Japan's view that the models are rather inadequate. It is imperative for ICCAT to obtain more sufficient data for the analyses and, therefore, proposed that the scientific monitoring level be raised to 3,850 MT.

The delegate from the U.S. presented his country's view (Appendix 3) and expressed its concern on the low abundance of the stock in spite of the stringent catch levels agreed by the Commission. It recognized that the stock recovery takes a long time and takes even longer for the fish entering the spawning population. Therefore, the U.S. proposed to maintain the 1987 catch level for scientific monitoring (i.e., 2,660 MT) for 1988. He noted that perhaps the level should be reduced but would agree to continue the recommendation from last year.

The delegate of Canada also expressed his concern on the low level of abundance and the slow recovery of the west Atlantic bluefin stocks (Appendix 4). Canada also felt that the recovery is particularly slow in Canadian waters because of its location on the migration pattern of bluefin. However, also recognizing the need for scientific monitoring, his country can agree with the present level for monitoring the catch.

After a short break, the delegate of Canada reported that the U.S., Japanese and Canadian delegates had reached a consensus and the Canadian delegate amended his proposal accordingly, emphasizing the importance of the statement contained in research recommendations iv, v, and vi in the bluefin section of the SCRS Report. With this understanding the same regulation in 1988 as in 1987 was recommended for west Atlantic bluefin tuna.

The U.S. agreed with the Canadian proposal and Japan withdrew its proposal to increase the monitoring level, while expressing its hope that the SCRS will pay very close attention to these three research recommendations.

6.b) Albacore - north

No specific management recommendations were made by the SCRS and the Panel decided not to make any management recommendations at this time.

## 7. RESEARCH NEEDED TO BE CARRIED OUT

The Panel reiterated all the recommendations made by SCRS on statistics and research. In particular, for bluefin tuna, as stated under Agenda Item

6, special effort should be made to develop improved indices and further verify and refine the cohort analyses.

The Spanish delegate asked that the relation between the bluefin tuna in the Mediterranean and Atlantic be further investigated.

8. DATE AND PLACE OF NEXT PANEL MEETING

The next meeting of Panel 2 will be at the same time and place as the next Commission Meeting.

9. ELECTION OF CHAIRMAN

Canada nominated France as Panel Chairman and Portugal seconded the nomination. France was unanimously elected Chairman of Panel 2.

10. OTHER MATTERS

No other matters were discussed.

11. ADOPTION OF REPORT

The Report of Panel 2 was adopted.

12. ADJOURNMENT

The meeting was adjourned.

## REPORT OF THE MEETING OF PANEL 3

1. OPENING

The meeting was called to order by the Chairman, Mr. M. Morimoto (Japan).

2. ADOPTION OF AGENDA

The agenda was adopted without amendment (Appendix 1).

3. ELECTION OF RAPPORTEUR

Dr. W. Nelson (U.S.A.) was designated rapporteur.

## 4. REVIEW OF PANEL MEMBERSHIP

Brazil, Japan, South Africa and U.S.A. are members of Panel 3 and were present.

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

Mr. A. González-Garcés, SCRS Chairman, reviewed and summarized SCRS findings regarding southern bluefin and albacore in the south Atlantic.

### 5.a) Southern bluefin

The SCRS Chairman noted that the fishery for southern bluefin tuna occurs in the higher latitudes of the southern hemisphere. Although spawning is known only from middle latitudes of the eastern Indian Ocean, southern bluefin are highly migratory and circumpolar throughout the southern Pacific, Indian, and Atlantic Oceans. The stock is exploited mainly by Australian, Japanese, and New Zealand fishermen with most of the catch coming from the Pacific and Indian Oceans. The catches by Japan, Australia, and New Zealand in 1986 were about 17,000, 12,500 and 100 MT respectively. Longlines accounted for about 17,000 MT, with surface fisheries accounting for the remainder. In the Atlantic, catches have fluctuated between 500 MT and 6,200 MT during the past ten years, reflecting the shifts in fishing effort among oceans.

Because of concern over declining longline catch rates, Australian, Japanese, and New Zealand scientists re-evaluated the status of the stock during 1987. They noted a significant reduction in spawning stock biomass from the pre-exploitation level. A recent decline in abundance of 4-7 aged fish suggests future declines in spawning stock biomass and a risk of recruitment decline if current catch levels are maintained. As a result of these concerns, quotas already in place have been reduced to 11,500 MT and 19,500 MT for Australia and Japan, respectively. New Zealand maintains a quota of 1,000 MT.

### 5.b) Albacore, south

Mr. González-Garcés reported that the 1986 catch of southern albacore totaled 27,900 MT, down slightly from the 28,200 MT taken in 1985. The longline fishery took 23,000 MT, with 21,100 MT of the total taken by Taiwan. The remainder of the catch (4,900 MT) was taken in the surface fishery, primarily by South Africa. While a large increase in catches occurred between 1984 and 1985 as a result of increased effort in the south Atlantic, additional effort was not put into the area in 1986 and the catches remained relatively stable.

An evaluation of CPUE trends in the southern albacore longline fishery showed a decline from 1967 to 1973, followed by a stable CPUE through 1986. Trends in catch from 1967 through 1986 are considered to be a direct function of effective fishing effort. An estimate of MSY, obtained by produc-

tion model for the 1967 to 1985 time period, ranged between 23,800 MT and 24,800 MT. Catches in 1985 and 1986 were slightly higher than the MSY estimate. The SCRS Chairman cautioned that the MSY model was based on catch and effort data from the longline fishery, and that different estimates might result from the inclusion of data from a surface fishery. The Committee concluded that the stock is being exploited at a level that is slightly beyond the MSY obtained by the longline-based production model, but that the effort intensity in 1985 and 1986 is within the range corresponding to MSY.

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

### 6.a) Southern bluefin

The Committee did not recommend any management measures for southern bluefin tuna in the Atlantic Ocean, since the stock is being managed by other international regimes through quotas.

### 6.b) Albacore, south

There were no specific suggestions for conservation measures. However, since the stock is being exploited slightly beyond the MSY level, it is recommended that catch and effort be closely monitored.

## 7. RESEARCH NEEDED TO BE CARRIED OUT

### 7.a) Southern bluefin

No research was recommended.

### 7.b) Albacore, south

Specific research needs identified included a comparison between ICCAT port sampling and Taiwan national sampling to check for effort duplication, increased data collection and analysis of effort data from the south Atlantic surface fishery, CPUE analysis of longline data combined from the Atlantic and Indian Oceans for stock structure clarification, tagging programs and growth studies.

## 8. DATE AND PLACE OF NEXT PANEL MEETING

The Panel agreed that it would meet in conjunction with the next meeting of the Commission.

## 9. ELECTION OF PANEL CHAIRMAN

South Africa nominated U.S.A. as Chairman of Panel 3 and Japan supported this nomination. U.S.A. was unanimously elected chairman of Panel 3.

10. OTHER MATTERS

No other matters were discussed.

11. ADOPTION OF REPORT

The report was adopted.

12. ADJOURNMENT

The meeting was adjourned.

## REPORT OF THE MEETING OF PANEL 4

1. OPENING

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

2. ADOPTION OF AGENDA

The Agenda was adopted without amendment (Appendix 1).

3. ELECTION OF RAPPORTEUR

Ms. R. S. Rootes (U.S.A.) was designated rapporteur.

4. REVIEW OF PANEL MEMBERSHIP

All nine Panel members were present at the meeting. There were no changes in Panel membership.

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

Mr. A. González-Garcés, SCRS Chairman, reviewed and summarized the SCRS findings regarding the species of concern to Panel 4, i.e., bigeye tuna, small tunas, billfish and swordfish.

5.a) Bigeye

Mr. González-Garcés reviewed the wide distribution of Atlantic bigeye tuna between the 40°N and 40°S latitudes with the spawning grounds located

in the tropical range of the distribution area. The stock is fished by longlining, tropical purse seines and artisanal fisheries. The total catches for bigeye were highest in 1985 with a total catch of 74,500 MT but showed a decrease of 15 percent in 1986. The Bigeye Day Session of the 1986 SCRS meeting supported the single-stock hypothesis on which the evaluation of the stock was based. Although the trend for relative abundance of the adult stock has been on a slight increase, this trend may not accurately reflect abundance due to the two gear types--regular and deep longline--used in the calculation of CPUE. New estimates for MSY ranged between 73,600 and 174,800 MT with the new calculations maintaining the previous yield curves with slightly higher values of MSY.

5.b) Small tunas

Mr. González-Garcés reported that while the tonnage in each species of small tunas caught was not high these species constitute a socially important resource to the 43 countries that report fisheries on these stocks. For the period 1983-86 reported total catches of small tunas are around 90,000 MT while during the 1980-83 period the catches were around 120,000 MT. This decrease may be attributable to similar decreases in the Turkish catch of Atlantic bonito in the Mediterranean from 30,000 MT in 1983 to 8,000 MT in 1986 and in the U.S.S.R. catches of Atlantic black skipjack in the Atlantic from 6,000 MT to 1,000 MT in the same period.

5.c) Billfishes

The fishery on billfish is both an incidental take to the tuna longline fisheries and a directed fishery by sport fishermen and artisanal fishermen. The analysis of the status of the stocks of billfishes was last completed in 1982 and hence only the following summaries were provided:

i) Blue marlin: Landings have not shown any long-term trends but CPUE data have indicated some over-exploitation. Although only incomplete data is available, the average weight of catches has been decreasing reinforcing earlier concerns regarding over-fishing.

ii) White marlin: The catch trend since the 1970's appears to be decreasing although the data base since 1982 is considered insufficient to evaluate.

iii) Sailfish/spearfish: Longline fisheries report statistics for both sailfish and spearfish together while the artisanal and sport fisheries do not. The trend for harvests for the total Atlantic seems to be increasing due largely to increased catches in the eastern Atlantic.

5.d) Swordfish

The swordfish fishery is composed of drift surface longline, harpoon and drift gillnet fisheries with drift surface longline making up 80 percent of the catch total. Since 1984 there has been a steep increase in catch totals attributable to improved data collection in the Mediterranean Sea and an expanding fishery in the Atlantic.

A single-stock hypothesis for swordfish was favored for the North Atlantic; however, the two-stock hypothesis was not discarded and a single stock is hypothesized in the Mediterranean. In the south Atlantic some exchange of fish with the Indian Ocean may occur. A workshop on swordfish resulted in significant improvements to the swordfish data base which will facilitate quantitative assessments on an Atlantic-wide basis. An analysis of standardized Spanish CPUE for the northeastern and central Atlantic was conducted for 1972-1986 data and stability was reported in the north Atlantic.

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

No new stock conservation measures were discussed. However, the minimum size limit on bigeye tuna should be maintained at 3.2 kg. Concern was expressed that management measures may be necessary in the future on several stocks including billfish and possibly small tunas. Increased monitoring was stressed for billfish landings.

## 7. RESEARCH NEEDED TO BE CARRIED OUT

The following research needs were highlighted by the SCRS Chairman:

i) Bigeye tuna: The on-going multi-species sampling of the surface catch in the eastern tropical Atlantic should be continued as recommended last year. Species and size sampling of catches transshipped to Puerto Rico should be continued as well as calibration of gear efficiency between regular and deep longline operations. An index of abundance should be developed and the age-structured stock analysis should be updated.

ii) Small tunas: Studies should be undertaken to provide or complete the biological data of the main small tunas including defining size and structure of the stocks, ecology and migratory schemes. A method for estimating fishing effort should be studied.

iii) Billfishes: Research outlined in SCRS/87/14 was stressed as a top priority in order to collect the basic data necessary for stock assessment for billfish. The needs include detailed catch and effort statistics, expanded tagging programs, on-board at-sea observers and age and growth studies.

iv) Swordfish: The Workshop did not complete its work and therefore, an additional workshop is necessary to complete the analysis on status.

The delegate from the U.S. expressed concern over the apparent decline in the swordfish resource at least in the area within U.S. jurisdiction and indicated that the U.S. Fishery Management Councils bordering the Atlantic are continuing their efforts to bring that part of the swordfish stock under U.S. jurisdiction under rational management measures. The U.S. further noted its support for a second SCRS Swordfish workshop in 1988 to update the data base and complete the assessment (see Appendix 5 for the full text).

The U.S. delegate then recognized that the SCRS has expressed serious concern in regard to the status of billfish stocks for several years. In 1986 the Commission approved the startup of the Enhanced Research Program for Billfish to 1) provide more detailed catch and effort statistics, 2) expand the ICCAT tagging program to include billfish; and 3) assist in collecting data for age and growth studies. The U.S. noted that in recognition of the ICCAT budgetary constraints it offered that the budget of the Enhanced Research Program for Billfish will forthwith be provided by private fishing groups of many countries. The U.S. delegate pointed out that the U.S. Fishery Management Councils are proceeding with their plan to enhance the billfish data base and expressed U.S. support for the SCRS efforts to obtain the data base required for assessments (complete text attached as Appendix 6).

The delegate from Japan noted that the donation of money from outside sources for the conduct of research on billfish was a hopeful sign but stressed that it also required close examination. He further emphasized that no changes or expansions in the Billfish Research Program should be made without first being examined by the SCRS and the Commission, and also stated that the feasibility of continuing this special research project should be examined carefully next year. He further confirmed that the funding from outside sector should not impose any obligation to ICCAT because this project would be conducted under ICCAT.

The delegate from Spain stated support for the conduct of a second swordfish workshop to be held in 1988 and indicated that if ICCAT was financially able, Spain would have put forward a more expanded study on swordfish rather than the workshop. The Spanish delegate emphasized that the Billfish Program was approved as a pilot program for one year and ICCAT should, given its financial limitations, direct its attention to the more important species and therefore restrict the time and scope of the billfish research program.

The Chairman summarized the discussion of the research programs and workshops included under Panel 4 and indicated that on questions of funding or financial support, it was appropriate to forward these proposals to STACFAD for consideration.

## 8. DATE AND PLACE OF NEXT PANEL MEETING

The Panel agreed that it would meet in conjunction with the next meeting of the Commission.

## 9. ELECTION OF PANEL CHAIRMAN

U.S.S.R. was unanimously re-elected Chairman of Panel 4.

## 10. OTHER MATTERS

No other matters were discussed.

11. ADOPTION OF REPORT

The report of Panel 4 was adopted.

12. ADJOURNMENT

The meeting was adjourned.

*Appendix 1 to Annex 6*

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

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

| PANEL 1 | PANEL 2 | PANEL 3 | PANEL 4 |
|---|---|---|---|
| a) Yellowfin | a) Bluefin (North) | a) Southern bluefin | a) Bigeye |
| b) Skipjack | b) Albacore (North) | b) Albacore (South) | b) Atlantic bonito |
| | | | c) Billfishes |
| | | | d) Other species |

7. Research
8. Date and place of next Panel meeting
9. Election of Panel Chairman
10. Other matters
11. Adoption of Report
12. Adjournment

## Japanese Statement on Bluefin Tuna
(Attached to Report of Panel 2)

1. Japan was disappointed to learn from our scientists that the resource evaluation of bluefin tuna in the western Atlantic for 1987 was once again inadequate.

2. It is clear that the SCRS has found that selecting input parameters is difficult and can easily yield varying results. This year the SCRS reports that the small-sized bluefin are not as abundant as previously predicted. The SCRS also reported that the decrease in large fish is not as severe as determined previously. These quite different results can be attributed to the fact that the input parameters used in this year's calculations were different from those used previously.

3. ICCAT scientists try their best to obtain the best fisheries' analyses. Even so, it is recognized that fishery science is still in its infant stage. Scientists, while trying their best in their calculations, must not lose sight of field obeervations. For example, it was reported that this year Canada sighted many small-sized "jumping schools" off their coast. This phenomenon has not been seen in recent years. How can we reconcile this with the SCRS report on small-sized bluefin? As it is commonly recognized that VPA is inexact, why are field observations ignored?

4. Controls on the catch of small-sized fish are generally considered desirable from a conservation and management view. However, because of the allocation of the bluefin scientific monitoring quotas, the level of catch of fish age 1-5 has been reduced to approximately 1/30th of the level of the early 1970's. This drastic reduction makes it difficult to make adequate analysis.

5. It is imperative for ICCAT to obtain more sufficient data for our analysis. Japan proposes that the scientific monitoring catch quota for western Atlantic bluefin tuna be increased to 3,850 MT. This was also recommended last year and we hope the Commissioners will understand the importance of our proposal and the reasons for it.

*Appendix 3 to Annex 6*

## U. S. Statement on Bluefin Tuna

**(Attached to Report of Panel 2)**

The United States commends the Standing Committee on Research and Statistics for its continued intense efforts to accurately assess the status of the northern bluefin tuna stocks. The stock of the western Atlantic is of special concern to the United States. While relatively small in tonnage, it is an extremely valuable fishery for both commercial and recreational users.

The continued indication of this stock's low abundance is very disturbing, especially in light of the stringent management measures agreed to in 1982. We do recognize that several years will be needed to assess the size of recruitment in the year classes since that date and hopefully to see a gradual rebuilding of the stock and even more years for that recruitment to enter the spawning stock. In view of the apparent lack of progress to date in rebuilding abundance and the estimation that current stocks range from 15 to 30 percent of 1970 levels, United States supports a continuation of the present management measures, with no increase in the 2,660 metric ton scientific monitoring catch limit for 1988. Indeed, United States does recognize there may be need to consider a reduction in this quota in future years if stock abundance continues at its present low state.

*Appendix 4 to Annex 6*

## Canadian Statement on Bluefin Tuna

**(Attached to Report of Panel 2)**

Canada has carefully reviewed the advice of the Standing Committee on Research and Statistics (SCRS). Its findings support the view of the Canadian industry that the stocks are still below the levels anticipated and that the recovery is not occurring at the rate expected. A very cautious approach to harvesting must therefore be maintained.

Because of its location on the migration pattern of bluefin, Canada is particularly worried about the length of the recovery period and the corresponding delay in achieving the benefits that it will bring.

Faced with decreasing landings, the Canadian industry is becoming more concerned for the long-term stability of this fishery. The preference of the Canadian delegation would be to decrease the level of harvesting of bluefin tuna in the western Atlantic in order to hasten the recovery process.

However, because of the need to sustain the established scientific monitoring levels and in light of the concerns expressed by other delegations, Canada requests that the report of this Panel emphasize the importance of the statements contained in the SCRS Report, Section BFT-4.b, sub-sections iv, v, and vi. Canada would be agreeable to the continuation of the current management measures for 1988.

*Appendix 5 to Annex 6*

## U. S. Statement on Swordfish

**(Attached to Report of Panel 4)**

The U.S. delegation expresses concern over the apparent decline in the swordfish resource, at least in the area within the geographic jurisdiction of the United States. In recent years, there has been a decline in the number of large fish which form a portion of the adult spawning stock in the west, a decline in the average size of swordfish harvested across the North Atlantic, and a marked decline of certain domestic fisheries.

These conditions suggest that management measures may be required in the near future. In the United States, the five regional Fishery Management Councils bordering the western Atlantic have expressed serious concerns over the apparent condition of the swordfish resource for the reasons cited above. These councils are continuing their efforts to bring that portion of the swordfish stock or stocks under U.S. jurisdiction under rational management measures. Thus, we urge continued monitoring and assessment of the stock by ICCAT in cooperation with appropriate member states. In this regard, we note that the workshop conducted last month in Madrid did not complete its assessment. Thus, we endorse the SCRS request for a second swordfish workshop in 1988 to update the data base and complete the assessment task.

## U. S. Statement on Billfish
**(Attached to Report of Panel 4)**

The U.S. delegation recognizes that the SCRS has expressed serious concern for several years with regard to the status of billfish stocks even though no management recommendations have ever been presented in SCRS Reports. Both past and present Reports continue to emphasize that the data necessary to conduct an assessment of the status of billfish stocks is not available. In 1986 the Commission approved the startup of the Enhanced Research Program for Billfish. The three primary objectives of the Enhanced Billfish Research Plan (SCRS/87/14) are to:

1. Provide more detailed catch and effort statistics;
2. Expand the ICCAT tagging program to include billfish; and
3. Assist in collecting data for age and growth studies.

The U.S. and other interested nations strongly supported initiation of this program. In recognition of ICCAT budgetary restraints, the proposed budget presented in SCRS/87/14 as of now will be provided by private fishing groups of many countries and we propose that this funding mechanism continue. The overall objective of the program is to develop the ability to acquire the data necessary to assess the status of the stocks.

We concur that the program plan targets the appropriate areas so that significant progress can be made. The U.S. domestic Fishery Management Councils are proceeding with their plan which will enhance the billfish data base. We recognize that to accomplish the goals of the Program, the various types of data needed to conduct a rigorous stock assessment are not yet adequate. We are gratified that SCRS is directing its efforts towards the end of obtaining the data base required for assessments.

# REPORT OF THE INFRACTIONS COMMITTEE

(Azores, Portugal, November, 1987)

## 1. OPENING

The meeting of the Committee was opened by its Chairman, Mr. B. García Moreno (Cuba).

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

The agenda (COM/87/6) distributed before the meeting was adopted without changes. The agenda is attached as Appendix 1.

## 3. ELECTION OF RAPPORTEUR

The Chairman designated Mr. J. L. Cort (Spain) as rapporteur.

## 4. UPDATING OF TABLES OF STATUS OF ADOPTION OF REGULATORY MEASURES

The Executive Secretary presented document COM/87/17 which deals with the recommendations for regulatory measures of the Commission, emphasizing the tables that summarize the measures taken by the different countries with respect to the application of these recommendations. He stressed that this information must be submitted in writing because of its official nature. He also reminded the Committee that the recommendations for regulatory measures are reviewed at each SCRS meeting, in light of the new scientific conclusions.

In Table 1 (recommendations on the size limit adopted for yellowfin, bigeye and bluefin), attached as Appendix 2, it can be seen that most of the countries have already taken the necessary measures regarding yellowfin. The situation is the same for bigeye, but some countries have still not confirmed whether their approval of the temporary recommendation was automatically extended indefinitely. With respect to bluefin, it can be seen that no comments appear for several countries in the Table, due to the fact that they do not fish for this species.

Table 2, included in Appendix 2, summarizes the recommendation on bluefin fishing mortality, which is also for an indefinite period. Some countries have indicated that they have difficulties in following this recommendation.

Table 3 of Appendix 2 refers to a regulation on the fishing of bluefin in the west Atlantic. It may appear incomplete but it concerns only the countries directly involved in this fishery. Any additional information submitted by other countries is only complementary.

The Chairman recalled that these tables should be completed as soon as possible and asked that those countries which have not yet submitted information to do so.

The delegate of Equatorial Guinea indicated that his country would submit this information within a very short time, since the Ministry responsible for this has already taken the necessary measures. This information is included in the Fishery Law (which includes tuna), put into effect in Equatorial Guinea in February of this year.

## 5. REVIEW OF THE REPORTS OF INSPECTIONS CARRIED OUT

The delegate of Spain mentioned that the Spanish inspectors have already carried out a number of inspections but have not submitted any report since they did not detect any infractions. The Chairman requested, however, that the countries in this situation submit a summary of the work carried out.

The delegate from South Africa confirmed that they had carried out fifteen inspections, but no infraction had been detected.

The delegate of the United States noted that under application of the Inspection Scheme, formal reports of inspections are only necessary in the case of foreign vessels and none were carried out by the U.S. in 1986. However, inspections of domestic vessels are regularly carried out to determine compliance with regulations based on ICCAT recommendations and the U.S. submitted its report for the record.

The delegation from São Tomé and Principe communicated that his country had not carried out any inspections as regards tunas, but that next year they will begin this activity, since his country is going to create a semi-industrialized fishing unit for these species.

## 6. UPDATING OF LISTS OF AUTHORIZED AND NATIONAL CORRESPONDENTS

The Chairman presented the corresponding section of document COM/87/18.

As regards inspectors, the following countries have communicated the name and address of the authorized persons: Angola, Brazil, Cuba, Spain, Gabon, Portugal, São Tomé and Principe, South Africa, United States and Uruguay. The delegation of São Tomé and Principe confirmed that they would transmit shortly the name of inspectors.

The following countries have communicated the name and address of the their national correspondents: Brazil, Cuba, France, Portugal, Senegal and United States. Angola just now provided the name and address of its correspondent.

## 7. FUTURE WORK OF THE COMMITTEE AND PLANS FOR IMPROVEMENT

The Chairman noted that the Committee now has the means at its disposition to intensify its work. He suggested in the first place to increase the number of inspections and to carry them out more regularly.

He reminded the participants that the Infractions Committee is not an isolated organism, but rather its activity depends directly on the recommendations enacted by the Commission, which makes it a direct extension of the scientific Committee's work.

The Chairman requested that the inspections usually be carried out in the ports where the species under inspection could be landed.

## 8. DATE AND PLACE OF THE NEXT COMMITTEE MEETING

The Infractions Committee will meet at the same time and at the same place as the next Commission meeting.

## 9. ELECTION OF CHAIRMAN

Mr. B. García Moreno (Cuba) was re-elected Chairman of the Infractions Committee.

## 10. OTHER MATTERS

No other matters were discussed.

## 11. ADOPTION OF REPORT

The report was adopted.

## 12. 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. Updating of Tables of Status of Adoption of Regulatory Measures
5. Review of the reports of inspections carried out
6. Updating of lists of authorized and national correspondents
7. Future work of the Committee and plans for improvement
8. Date and place of the next Committee meeting
9. Election of Chairman
10. Other matters
11. Adoption of Report
12. Adjournment

Table 1 - Status of adoption of regulatory measures on size limits by the member countries for YELLOWFIN, BIGEYE and BLUEFIN TUNAS (up to December 31, 1987)

| Species | YELLOWFIN | BIGEYE | | BLUEFIN |
|---|---|---|---|---|
| Commission recommendation | 3.2 kg limit | 3.2 kg limit | 3.2 kg limit | 6.4 kg limit |
| Area of application | Entire Atlantic | Entire Atlantic | Entire Atlantic | Entire Atlantic |
| Date of entry into effect | July 1, 1973 | September 7, 1980 | July 17, 1985 | August 10, 1975 |
| Date of expiration | Indefinite period | December 31, 1983* | Indefinite period | Indefinite period |
| Angola | Jun. 17, 1979 | | | No fishing |
| Benin | | | | |
| Brazil | Feb. 23, 1973 | Mar. 1981 | | |
| Canada | Sep. 4, 1973 | No fishing | | Feb. 17, 1973 |
| Cape Verde | Sep. 5, 1987 | | Sep. 5, 1987 | |
| Cuba | Jul. 1, 1973 | Sep. 7, 1980 | | No fishing |
| Equatorial Guinea | No fishing | | | |
| France | Jun. 29, 1973 | Mar. 3, 1981 | | Aug. 8, 1975 |
| Gabon | No fishing or landings | 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 | 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 | Aug. 10, 1984 | Nov. 27, 1976 |
| São Tome and Principe | | | | |
| Senegal | Jul. 2, 1976 | Jul. 2, 1976 | Jul. 2, 1976 | |
| South Africa | May, 1973 | Dec. 5, 1980 | Dec. 5, 1980 | Jun. 27, 1975 |
| Spain | May 29, 1974 | | Aug. 14, 1987 | Mar. 3, 1975 |
| Uruguay | | | | |
| U.S.A. | Nov. 5, 1975 | Mar. 30, 1981 | Apr. 9, 1986 | Aug. 13, 1975 |
| U.S.S.R. | Sep. 28, 1978 | Sep. 28, 1978 | | Sep. 28, 1978 |
| Venezuela | | | | |

*Extended to December 31, 1984.

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

Table 2 - Status of adoption of regulatory measures on BLUEFIN TUNA fishing mortality by the member countries (up to December 31, 1987)

| Commission recommendation | Limiting fishing mortality to recent levels | | | | |
|---|---|---|---|---|---|
| | | 1st Extension | 2nd Extension | 3rd Extension | 4th 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 | Feb. 15, 1979 |
| Cape Verde | | | | | |
| Cuba | ---------Zero catches in 1976-78--------- | | | | |
| Equatorial Guinea | | | | | |
| France | | Dec. 27, 1974 | 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 | ** | ** | ** |
| São Tome 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.

Table 3 - Status of adoption of regulatory measures on west Atlantic BLUEFIN TUNA catches by the member countries* (up to December 31, 1987)*

| Commission recommendation | Catch prohibited, except for monitoring purposes | | | | |
|---|---|---|---|---|---|
| Date of entry into effect | Feb. 15, 1982 | Jan. 1983** | Jan. 1984 | Jan. 1985 | Jan. 1986 |
| Date of expiration | Feb. 14, 1984 | Jan. 1984 | Jan. 1985 | Jan. 1986 | Jan. 1987*** |
| Angola | ----------No fishing---------- | | | | |
| Benin | | | | | |
| Brazil | ----------Developing fishery not subject to limitation---------- | | | | |
| Canada | Jun. 14, 1982 | Jun. 21, 1983 | | | |
| Cape Verde | | | | | |
| Cuba | ----------Developing fishery not subject to limitation---------- | | | | |
| Equatorial Guinea | | | | | |
| France | | | | | |
| Gabon | ----------No fishing or landings---------- | | | | |
| Ghana | | | | | |
| Ivory Coast | | | | | |
| Japan | Mar. 3, 1982 | Mar. 7, 1983 | Mar. 7, 1983 | Mar. 7, 1983 | Mar. 7, 1983 |
| Korea | | | | | |
| Morocco | | | | | |
| Portugal | ----------No fishing---------- | | | | |
| São Tome and Principe | | | | | |
| Senegal | | | | | |
| South Africa | ----------No fishing or landings---------- | | | | |
| Spain | | | | | |
| Uruguay | | | | | |
| U.S.A. | Jun. 11, 1982 | Jun. 17, 1983 | Jul. 24, 1984 | Nov. 25, 1985 | Nov. 25, 1985 |
| U.S.S.R. | | | Feb. 15, 1984 | Feb. 15, 1984 | |
| Venezuela | | | | | |

*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".

**February, 1982, recommendation amended.

***This recommendation was extended until the end of 1987 and again until the end of 1988 (see Item 23.2 of the 1987 Comission Proceedings, contained in the Biennial Report, 1986-87, Part II).

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

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

(Azores, Portugal, November 19-23, 1987)

## 1. OPENING OF THE MEETING

1.1 The 1987 meeting of the Standing Committee on Finance and Administration (STACFAD) was opened by Mrs. P. García Doñoro (Spain), the Committee Chairman. All the countries attending the Tenth Regular Meeting of the Commission were present. (See Appendix 2 to the Commission Proceedings.)

## 2. ADOPTION OF AGENDA

2.1 The Tentative Agenda was reviewed. The Chairman noted that Agenda Item 19 (Study of the bases for calculating the contributions of the member countries) was included in the Agenda as proposed at the 1986 Commission meeting. The Committee adopted the Agenda which is attached as Appendix 1.

## 3. ELECTION OF RAPPORTEUR

3.1 The Secretariat served as Rapporteur.

## 4. PANEL MEMBERSHIP

4.1 The Committee reviewed document COM/87/7 for Panel membership and confirmed that there had been no changes in Panel membership during the past year.

## 5. RATIFICATION OF THE PROTOCOL TO THE CONVENTION

5.1 The Chairman referred the Committee to the Administrative Report (COM/87/8). She reiterated the eleven countries which had ratified the Protocol to the Convention up to the time of the Meeting (France, São Tomé and Principe, Korea, South Africa, Uruguay, Japan, Senegal, Cape Verde, U.S.S.R., U.S.A. and Spain). The Delegate from Portugal commented that his country had ratified the Protocol but that the notification had not yet reached the Food and Agriculture Organization of the United Nations (FAO), the depository of the ICCAT Convention. The Delegate of Canada commented that his country is still in the process of ratification and noted that the procedure would be completed soon. The Delegate of Angola also mentioned that the procedure of ratification is well advanced. The Delegate of Cuba

commented that the ratification process is under way in his country. The Delegate of Equatorial Guinea declared that ratifiction procedures had been initiated and that they would be completed very soon.

5.2 The observer of the European Economic Community (EEC) stressed the importance of ICCAT by reaffirming the EEC's intent to contribute actively to the work of the Commission as it does in other fisheries organizations. She nevertheless insisted on the fact that its collaboration and its contributions can only be complete and efficient once the EEC becomes a member of ICCAT, as concerns the payment of a financial contribution as well as contributions towards improving Commission activities, e.g., by submitting better information on fthe ishing activities of the EEC member countries which are not now members of ICCAT. At this point the EEC could only participate indirectly at the request of developing countries with whom it has signed fishing agreements, by participating in scientific programs or by contributing to their participation at ICCAT meetings.

5.3 The Observer from the EEC thanked the countries which had approved the protocol of adhesion of the EEC to ICCAT since the last meeting. She suggested that the Chairman of the Commission appeal to those countries which have not yet ratified the Protocol and write to those who are not present at this meeting to find out the status of their ratification procedures and urge all of them to expedite these procedures inasmuch as possible. The Committee agreed with this suggestion.

## 6. COORDINATION OF RESEARCH

6.1 The Executive Secretary referred STACFAD to Documents COM/87/8 and COM/87/13 and noted the activities in which the Secretariat was involved as regards coordination of research and statistics.

6.2 The Assistant Executive Secretary outlined briefly the scientific meetings at which he represented the Commission. He also presented information on specific coordination of research items, such as the ICCAT data base, computer facilities, coordination of the Yellowfin Year Program and the Enhanced Program of Billfish Research.

## 7. RELATIONS WITH OTHER ORGANIZATIONS

7.1 Collaboration with other international organizations as regards scientific and administrative matters was reviewed (COM/87/8 and 13). Special mention was made of the Ad Hoc Consultation on Global Tuna Statistics (COM/87/16) to improve world tuna statistics, and address problems caused by mixed catches taken by fleets fishing in two oceans.

## 8. COMMISSION PUBLICATIONS

8.1 The Executive Secretary outlined Commission publications and emphasized that efforts were made throughout the year to cut publication and mailing costs, e.g. the printing quality of the "Biennial Report" has been lowered and all printing was done at the Secretariat.

8.2 It was recognized that some embassies have accepted the responsibility of sending Commission publications. The Delegate of Korea expressed his willingness to receive all publications through Korea's Embassy in Madrid. The Chairman urged the member countries to do everything possible so that Commission publications could be mailed through their respective embassies in Madrid and indicated that this would represent considerable savings in the Commission's mailing costs.

## 9. MEETINGS DURING THE YEAR

9.1 The Committee reviewed the meetings held during the year and those at which ICCAT was represented. It was noted that ICCAT, in order to reduce travel expenses to international meetings, had not participated in the ICES meeting and was represented at the Indian Ocean Fisheries Committee meeting by a scientist who usually attends ICCAT meetings as part of a national delegation.

9.2 France expressed doubt, in light of the current budgetary situation, about Secretariat participation in some specific meetings, namely, the CWP, the Ad Hoc Consultation on Global Tuna Statistics, the Lake Arrowhead Conference. The Secretariat responded by justifying its participation at those meeting which it traditionally attends.

9.3 The Delegate of France recognized the necessity of ICCAT's being represented at these meetings but it proposed that until further notice, ICCAT be represented as an observer by delegates of the member countries.

9.4 The Committee asked the Secretariat to see to the implementation of this proposal and requested that ICCAT observers designated by the Secretariat present a report of those meetings at which they represented ICCAT.

## 10. OTHER ADMINISTRATIVE MATTERS

10.1 Reference was made to such administrative matters as current staff and other trips made by the Secretariat staff during 1987. These matters are outlined in more detail in the Administrative Report (COM/87/8).

## 11. AUDITOR'S REPORT - 1986

11.1 The Executive Secretary referred the Committee to the Convention and the Financial Regulations and explained the background of the Commission audit. He presented the 1986 Auditor's Report (COM/87/10) which had been distributed in the spring of 1987 and again during the session.

11.2 The Committee approved the 1986 Auditor's Report.

## 12. FINANCIAL STATUS OF THE SECOND HALF OF THE BIENNIAL BUDGET (1987)

12.1 The Executive Secretary referred STACFAD to Documents COM/87/11, 12 and 19. He made particular reference to Document 12 which concerns

Commission finances in general. He pointed out that the Secretariat staff has been kept to an absolute minimum which is compensated for by the wide distribution of duties and obligations among the staff members. He reiterated the adverse effect which the US$/Peseta exchange rate has had on the Commission's finances.

12.2 The Committee's attention was called to the tables attached to COM/87/12 and the Executive Secretary explained these in detail. Graphs were distributed to the Committee and these were explained in terms of the real value of the Commission budget in dollars and pesetas.

12.3 The Delegate of Portugal announced that his country's contribution for 1987 has been paid and that the Secretariat should be receiving it very soon.

12.4 The U.S. delegate reiterated his country's concern about the Commission's current financial situation and noted that the U.S. releases the Commission of the stipulation of matching funds (i.e., the initial $10,000 allocated by the Commission for billfish research can be used for other Commission business).

12.5 The Delegate of Spain expressed some displeasure on several matters, namely that the Spanish country report was missing from the Spanish version of the 1987 SCRS Report when it was distributed immediately after the scientific meeting and the manner in which it was presented on a separate page when the report was distributed at this meeting. Spain also requested some clarification from the Secretariat as to why the draft table of catch and canning on which the contributions are to be calculated was lacking Spanish catch data for 1986 which they had submitted in May.

12.6 The Delegate of Brazil noted that the Committee should be very careful to approve a realistic budget. He observed that Document COM/87/12, in particular section 13, seemed to indicate that the Working Capital Fund would be depleted to a critical level by the end of 1987. However, he noted that this does not appear to be the case, since some contributions are still being received. On the other hand, he explained that the reasoning whereby the contribution of the member countries decreases as a result of the depreciation of the dollar in relation to the other convertible currencies does not apply to Brazil. He added that there should be more comprehension of the delays in payments since many countries intend to pay their contributions on time but they cannot meet this obligation due to economic difficulties in their respective countries.

12.7 The Executive Secretary presented the 1987 Financial Report (COM/87/9). He referred the Committee to the tables attached to this document and explained them at length with respect to total Commission expenditures forecast for 1987 as well as Commission accounts, chapter by chapter, at the end of this Fiscal Year. The current status of Yellowfin Year Program fund was reported, as was that of the Enhanced Billfish Research Program.

12.8 A negative balance of $32,925 is expected at the end of Fiscal Year 1987. It was noted that this will be only the second time in the Commission's history that expenditures have exceeded the amount of the total annual budget approved.

12.9 The Delegate of Brazil expressed some disappointment that expenditures would surpass the authorized budget of the Commission, since the negative balance will have to be withdrawn from the already diminishing Working Capital Fund. Brazil requested the Secretariat to do everything possible to stay within the approved budget. With reference to Document COM/87/9, the Delegate of Brazil expressed concern over the problem of the pending contributions and added that on studying expenditures he observed that the major part corresponded to the chapters on salaries, travel and data processing. He said that these expenses should be taken in account when studying the budget for next year.

12.10 The Delegate of the U.S. inquired as to what the projected cash amount in the Working Capital Fund would be at the end of Fiscal Year 1987, including the return of the Yellowfin Year Program balance to the Fund, income derived from the delayed contributions, etc. It was clarified that $16,867 was forecast as the balance in the Working Capital Fund at the time the financial documents were prepared and $68,438 will be returned from the Yellowfin Year Program. Further clarifications on the Working Capital Fund were made at a later session after the matter of delayed payment of country contributions was studied. (See Section 16.1.)

12.11 The Delegate of France asked about trip expenses since they appear in three budget chapters (i.e. Chapters 2, 8-b and in the Enhanced Billfish Research Program Trust Fund.) It was recommended that in future financial reports these expenditures be clearly reported in terms of the trips made and how each was funded, etc. The French Delegate also commented on the home leave taken by the Secretariat staff and noted that while certain staff members were entitled to such leave, this expenditure should be clearly distinguished from other trips made for research purposes. He also believed that all home leave expenses should be considered as administrative expenses rather than expenses of coordination of research.

12.12 The Executive Secretary took due note of the above suggestion and agreed to separate home leave expenses from those for scientific purposes.

12.13 The Delegate of Canada shared the views expressed earlier by Brazil and also inquired about the number of current Secretariat staff since this number should have been reduced by one staff member with the departure of the biostatistician. The Executive Secretary clarified that no new staff were added this year.

12.14 Spain expressed concern over the negative balances shown for various budget chapters, especially those which are not relevant to scientific research. She noted that salaries have greatly surpassed the amount budgeted and felt that this was not justifiable.

12.15 The Executive Secretary responded that it would be very difficult to remain within the budget for Fiscal Year 1987 because, among other things, of the decline in the U.S. dollar/peseta exchange rate. He also referred to the high cost of computer maintenance contracts.

12.16 The Executive Secretary further commented that the Secretariat has no control over salary fluctuations since staff salaries are based on the U.N. scheme. He added that even though staff in the U.N. General Ser-

vices category are paid the same amount in local currency, when the U.S. dollar declines the Commission's expenditure increases in dollars. In addition, salaries of staff in the Professional Category also increase in terms of dollars according to the U.N. post adjustment. Consequently, even though salaries have been maintained at the same level in pesetas throughout the year, since the budget is in dollars the Salaries chapter increases as the U.S. dollar exchange rate drops.

12.17 The Executive Secretary reported on his trip to Venezuela and noted that he had just received a telex from the Ambassador of Venezuela in Madrid which informed that Venezuela had budgeted for 1988 the ICCAT contribution pending up to 1987 and that payment would be made in due time.

12.18 Further to the information presented by the Executive Secretary concerning his trip to Venezuela, the Delegate of Angola asked the Executive Secretary to explain the results of his trip to Senegal. The Executive Secretary responded that the trip was made because we were informed that Senegal intended to withdraw from the Commission. While in Senegal, the Executive Secretary explored all possible means to assure Senegal's stay in the Commission and sought ways to help that country pay its contribution, including the possibility of assistance through the EEC.

12.19 South Africa noted the importance of budget problems. He added however, that each international fisheries organization has its own unique problems. He noted that the Secretariat cannot be confined to headquarters. South Africa feels that the Secretariat has a proud record and noted that this is only the second time in its 18-year history that the Commission has shown a negative balance. He reiterated that the Secretariat has no control over salary increases. He indicated that perhaps the Secretariat lacks clear guidelines with respect to important budgetary issues. The Delegate of South Africa appealed to the delegates to look to the future rather than dwelling on hindsight. He suggested we spend more time seeking solutions to our problems.

12.20 The Chairman of the financial committee reiterated the good work carried out by the Secretariat over the years. She suggested that STACFAD establish criteria during the meeting so that the Executive Secretary can have adequate guidelines to carry out its mandate. She added that while it is important to think of the future we should also take into account our experiences in the past.

## 13. FINANCIAL STATUS OF THE YELLOWFIN YEAR PROGRAM

13.1 The Executive Secretary referred to the pertinent section of the 1987 Financial Report regarding the status of the Yellowfin Year Program (YYP). The Committee was informed that the current balance of YYP funds is $93,438.17, from which the SCRS requested that $25,000 be reserved to meet expenditures foreseen till the termination of the Program. The SCRS also recommended that the estimated unused balance of $68,438.17 be returned to the Working Capital Fund.

13.2 The Committee concurred with these recommendations.

## 14. TRUST FUND FOR THE ENHANCED BILLFISH RESEARCH PROGRAM

14.1 The Committee Chairman referred to the Financial Report (COM/87/9) which provides information about funds (totaling $25,500) received in 1987 from the U.S. private sector. The Committee was informed that there is a current balance of $20,660.26 in the Billfish Trust Fund.

14.2 The U.S. Delegate noted that the concerns expressed by Spain and Portugal at the meeting of Panel 4 regarding the funding of this Program are legitimate. The primary concern of the delegates is the burden on ICCAT to manage this Program. The Delegate of the U.S. noted that this Program represents an opportunity to conduct valuable research on this important fishery. He cited, as an example, the fact that contributing parties in the recreational fishery represent 60,000 anglers in the U.S. alone and some 300,000 from 15 countries the world over. He added that the impact of the Program is important. He reminded the Committee that billfish are included in Panel 4, as outlined in the ICCAT Convention (Article VI). The U.S. Delegate pointed out there is both a precedent and a mandate for this work.

14.3 The U.S. Delegate informed the Committee that the contributions to the Program are intended to cover all costs which will be monitored internally by the Secretariat. These contributions can be considered as a resource to assist in the support of ICCAT staff already on payroll. He noted that Financial Regulation 8 provides for a trust fund of voluntary contributions and that Regulation 9 authorizes the Executive Secretary to administer such funds. He added that the Billfish Research Program can continue with no impact on the budget while it would allow ICCAT to expand its work and influence. He notified the Committee that U.S. will take every step to alley the concerns expressed by the member countries.

14.4 The Delegate from the United States referred to Statement 4 of the 1987 Financial Report (COM/87/9) which shows expenditures totaling $1,008 to date for the Billfish Program and total expenditures of $3,008 are forecast to end of the Fiscal Year. The aforementioned Report also shows expenses (including a feasibility study and some billfish sampling) charged to the Trust Fund. The Fund shows a current balance of $20,660.26 and we expect that an additional 35,500 will be received from the private sector. He also referred the Committee to the Billfish Program Plan (COM/87/14), for more details.

14.5 The U.S. Delegate noted that the $10,000 allocated last year by the Commission to this Program is no longer needed. Therefore, any balance from this amount can be released back into ICCAT available funds. However, the U.S. asked that this item line be kept on the budget only to show continued interest and that a symbolic figure, such as $500, be budgeted. He noted that Secretariat staff time spent on the Program would be minimal, since there are no tasks of consequence for the Secretariat, other than reporting the status of the Program, keeping track of the field activities and incorporation of data into a single data base. The Delegate of the U.S. reassured the member countries that the private sector agrees to cover all direct costs and any ascertainable overhead costs that would constitute an expense to ICCAT. He concluded his intervention by adding that the U.S. recommends that the Program for Enhanced Research on Billfish be continued for next year, as funded privately.

14.6 France noted receipt of funds from private sources complies with Rule 8 of the Commission's Financial Regulations so that the Executive Secretary can accept such funds or voluntary contributions. He added that such funds should have no stipulations for additional obligations on the part of ICCAT. Consequently, the Executive Secretary is only responsible to the Commission.

14.7 The U.S. Delegate clarified that there would be no other responsibilities or conditions placed on the receipt of such funds from private sources.

14.8 Portugal supported the comments made by France, and reiterated that such funds should bear no additional Commission obligations.

14.9 The Delegate of Spain noted that the U.S. agreed to provide adequate funds for billfish research and was pleased with this information. Therefore, we will not have to use ICCAT funds for this research.

14.10 While the Delegate of Japan does not oppose the Billfish Program for next year, he emphasized that there should be no expansion of billfish research until the SCRS has had a chance to study the matter next year. Japan stressed that outside funds should not impose any conditions on ICCAT and noted that the research program should be conducted under the auspices of ICCAT.

14.11 The observer from the BillFish Foundation noted that the development of research on billfish is interesting and he expressed in detail the concerns which the recreational fisheries have about the decline in billfish stocks in the Gulf of Mexico area. He also referred to some of the research efforts directed towards the conservation of these stocks taken by the coastal nations.

14.12 The observer from Mexico emphasized that the opinions expressed by multi-national interest groups do not necessarily reflect those of the Government of Mexico.

## 15. PENDING CONTRIBUTIONS OF THE MEMBER COUNTRIES

15.1 The Committee discussed the matter of pending contributions, which is the major cause of the Commission's serious financial difficulties.

15.2 The Delegate of Equatorial Guinea informed the Commission that on October 10, 1987, his Government agreed to pay its 1987 contribution of $2,000, but he noted that there has been some delay in the transfer of these funds to the Secretariat.

15.3 The Delegate of São Tomé and Principe informed the Committee that his Government has authorized payment of all the contributions pending up to now ($8,035) and he hoped that this amount would be received by the Secretariat in the very near future.

15.4 The Delegate of Cuba noted that since 1986 payment of his country's contributions has experienced some delay. At present, the Ministry of

the Fishing Industry has transmitted the pertinent instructions regarding these payments. However, he added that he could not give a definite date when payment would be effected.

16. REVIEW OF THE WORKING CAPITAL FUND

16.1 The U.S. Delegate requested the Executive Secretary to clarify the status of the real cash balance that will be available in the Working Capital Fund at the end of the Fiscal Year in view of income to be deposited to the Fund. The Executive Secretary responded that the revised anticipated balance at the end of Fiscal Year 1987 would be $182,779 ($16,867 from the balance already forecast, $2,000 from Equatorial Guinea, $8,035 from São Tomé & Principe, $22,439 from Portugal, $62,006 from Venezuela, $68,438 from the balance of the Yellowfin Year Program, and 3,008 from Billfish released funds).

16.2 The Delegate from Japan recognized that replenishment of the Working Capital Fund was adopted at the 1986 ICCAT meeting, and he added that Japan does not feel that this would solve the Commission's financial problems but it could encourage some countries to continue being in arrears. The Commission must make increased efforts to collect the pending contributions. The Delegate of Japan noted that the budget should be examined very carefully for any unnecessary items which might be excluded.

16.3 France supported the views expressed by Japan. France fears that an exercise aimed at replenishing the Working Capital Fund would lead to a situation which would be misleading and the Commission would be forever working towards replenishing that Fund. The Delegate of France added that the Commission cannot be based on a system of contributions that are never received. He stressed that the need to arrive at a realistic budgetary figure was more important than replenishing the Working Capital Fund.

16.4 Canada supported the comments expressed by Japan and France. The Delegate of Canada also indicted that Agenda Items 16, 17 and 20 should all be discussed together.

16.5 After interventions by various delegations, it was agreed that the Committee approve the current status of the Working Capital Fund with the reservation that the Fund will be studied again when the 1988 budget and country contributions are reviewed later on during the STACFAD Meeting.

17. BUDGET FOR THE BIENNIAL PERIOD, 1988-1989

17.1 An Estimated Budget (COM/87/11) of $898,000 for 1988 and $988,000 for 1989 was presented by the Executive Secretary for consideration by the Committee. While presenting the Budget, he explained that there are no additional activities proposed to be covered by this Budget. He added that Commission activities could only be carried out as proposed if the Peseta/-U.S.$ exchange rate averages about 120 and if all member countries pay all their contributions. As regards the 1989 Budget, the Executive Secretary noted that it is very difficult to make any estimates due to the instability of currency exchange rates. Therefore, he asked the Committee to pro-

vide him with specific instructions as to how to deal with a budget for two years hence.

17.2 The U.S. expressed the view that the Commission has served an extremely useful function over the years. Recognizing that the Commission's fiscal health has been affected by some factors which are beyond its control (i.e. currency fluctuation and inflation), compounded by delays and arrearages in contributions, the Commission faces serious difficulties.

17.3 The Delegate of the U.S. proposed a two-stage financial planning process: (1) that the Committee approve a reasonable total budget figure (e.g. $750,000); and (2) that an operating plan be devised to match spending with income. He added that the cash available in the Working Capital Fund should be maintained at approximately 15% of the total budget and that this Fund should be looked to only as a last resort for funding of unanticipated expenses. He also suggested that the Commission explore other ways to supplement income, such as payment for Commission publications, observer fees for meeting participants, etc. For the immediate future, however, activities should be reduced to match the Commission's real income. At the same time, a restructurization of ICCAT might be considered so that the Commission could operate on a solid basis in the future.

17.4 The Delegate of Portugal supported the opinion expressed by the U.S. Delegate. He added that we should make every effort to save ICCAT so that our valuable research work can be continued. While endorsing some of the points mentioned by the U.S., Portugal proposed that the Commission meeting be held every two years, as outlined in the Convention.

17.5 The Delegate of the U.S.S.R. expressed his support of the Chairman of the Committee and the Executive Secretary for their efforts to solve the Commission's financial problems. The Delegate of the U.S.S.R. commended the Commission's research on such highly migratory species as tunas. He supported the proposal by Portugal to hold the Commission meeting every two years. He noted that research priorities should be studied very carefully, and added that the Commission should consider stopping the financing of its scientific programs timely for a 1-2 year period as one of the possible measures to save the present financial situation of the Commission and that during that time research can be carried out on a national level. He expressed the view that the 1988 budget should not exceed the 1987 level, taking into account inflation, etc.. The U.S.S.R. Delegate noted that the Secretariat's work should be directed at trying to solve the pending contributions problem.

17.6 The Delegate of Brazil expressed comments along similar lines as other delegations and indicated that his country has made great effort to be present at ICCAT and that at this time there were problems in the balance of payments and foreign debt. Consequently, Brazil cannot accept the increase in the budget presented by the Secretariat which proposes an increase of 30% in relation to the previous year. He suggested $690,000, the level of the 1987 budget, as a starting point to discuss the 1988 budget. He was deeply concerned about the large increase in staff salaries. He also commented that the delayed and unpaid contributions by the developing countries should be reconsidered from a realistic point of view.

17.7 South Africa indicated his support for alternative year meetings. He referred the Committee to Articles III (paragraphs 4 and 5), V (paragraph 2) and XI of the Convention and noted that such procedure is not in conflict with the Convention. He also pointed out that according to Article V paragraph 2 of the Convention, the Council has to meet at least once in the interim period between regular meetings of the Commission.

17.8 The STACFAD Chairman reviewed the pertinent Convention Articles and confirmed what was indicated by the Delegate of South Africa. At the same time, it was confirmed that the Council should be comprised of the Commission Chairman and Vice-chairmen and representatives of not less than four and not more than eight Contracting Parties (Article V, paragraph 1, of the Convention).

17.9 France also agreed that a realistic budget should be discussed. He supported the proposal by Portugal of holding biennial Commission meetings, although he expressed some doubt as to the savings in the total meeting costs.

17.10 Canada pointed out that even if the Commission decides to meet biennially, the Council has to meet and the savings in meeting expense would then be only partial. As regards 1987 expenditures, the Delegate of Canada called the Committee's attention to the fact that travel expenses represented only 3 % of the total budget, whereas salaries represented over 60% of the budget. He stressed that this must be looked at very carefully and that some important, though very unpleasant, decisions would have to be made in this respect.

17.11 Spain presented a proposed total budget of $690,000, broken down by budget chapters, based on the implementation of the budget during 1987, with the exception of the chapters corresponding to salaries (Chapters 1 and 8-A).

17.12 The Committee Chairman asked the Delegates for their views on Chapter 1 (Salaries) of the Budget.

17.13 Both Cuba and U.S.S.R. noted that the problem is a very delicate one and added that they could not see how any savings could be made in this chapter.

17.14 The U.S. Delegate proposed that we study how much income we can realistically expect in the next operating year. He reiterated that a total budget of $750,000 would be a reasonable level. He pointed out that this budget would represent a 60% increase in the U.S. contribution, while for some countries, the increase may not be so substantial. The U.S. Delegate further observed that the real cash which the Commission may expect under this scenario would be about $560,000 to $580,000, based on our past experience. If this is the case, then the only way to remain within the real income is to reduce salaries. In addition, there are some other budget chapters where some savings could be made. He noted that the Working Capital Fund be kept as a buffer and that it should not be readily applied to make up for the pending contributions.

17.15 Canada supported the views expressed by the U.S. in that drastic measures are necessary in order to cut expenses in the salaries chapter, and this can be only achieved by laying off staff or freezing salaries next year.

17.16 The Delegate of Sao Tomé & Principe also indicated that if there is an increase in the budget, there will also be an increase in the pending contributions. Since the salaries chapter is too high he supported a freeze in salaries and a reduction in staff. He proposed that a small working group be set up to study this item in depth.

17.17 The Delegate of Côte d'Ivoire also noted that the proposed 1988 budget was too high, and that it represented an increase of 30%. He suggested a more reasonable figure, such as $720,000 to $730,000, as the base figure for the 1988 budget. He also expressed concern about the increase in salaries and agreed with a freeze in salaries in 1988. In noting that the annual meeting costs are very high, the Delegate of Côte d'Ivoire suggested that the SCRS may also meet on a biennial basis and added that perhaps the results of research would then be more relevant.

17.18 The Delegate of Spain could not agree with drastic measures which may result in staff cuts. At the same time, she indicated that a substantial increase in the budget could not be accepted, especially an increase as high as 30%.

17.19 The Delegate of Gabon supported overall cutbacks, but preferred cuts in the travel and annual meeting chapters rather than cuts in staff.

17.20 France expressed support of the U.S. and other delegations as to the need to discuss a realistic budget. He indicated that the Committee should come to an agreement on the total budget figure and then let the Executive Secretary allocate it by budget chapter. However, he added that the Committee could give some advice to the Executive Secretary in this respect. The Delegate of France suggested that perhaps the Executive Secretary could only freeze salaries of staff paid in dollars but not those of staff paid in local currency. He also noted that a considerable savings could be made by holding a Commission meeting every two years. He indicated that SCRS has been reporting the same results repeatedly in recent years and hence their meetings could be shortened considerably or a special meeting of scientists could be held at a given time. The Delegate of France noted that port sampling and biostatistical work could also be cut.

17.21 The Delegate of Korea believed that the proportion of salaries in the total budget was too high and proposed maintaining the same percentage for salaries as in 1987. He expressed some doubt about the savings the Commission could make by holding its meeting every two years, since the Council still has to meet in 1988.

17.22 The Delegate of Portugal supported the U.S. proposal of a total budget of $750,000 as a reasonable figure for 1988. He noted that the increase in salaries shown in the budget is very high (38%) and was not in line with salary increases in Spain. He asked the Executive Secretary to

clarify this substantial increase in terms of the real increase due to inflation and the part of the increase caused by a currency exchange rate unfavorable for U.S. dollars.

17.23 The Delegate of South Africa stated that he was not in favor of cutting the salary of the staff, since the Secretariat does such high quality work and all incentive will be lost if the salary chapter is severely cut.

17.24 The Delegate of Japan noted that he does not agree, in principle, to salary cutbacks as a solution of the problem. On the other hand, Japan recognized that any increases in salaries are based on regulations prevailing in international organizations.

17.25 The Delegate of Equatorial Guinea supported the U.S. proposal of $750,000 as a basic budget figure. He indicated, however, that his country could not accept a sudden increase in the total budget as proposed by the Executive Secretary.

17.26 The Delegate of Angola also commended the high level of work carried out by the Secretariat staff. He concurred with the proposal to create an ad hoc group to study the problem.

17.27 Brazil supported other delegations for a salary freeze, while recognizing the excellent work carried out by the Secretariat. He noted that the actual expenditure forecast for 1987 for salaries ($387,000) should be maintained for the 1988 budget. He observed that the expenses forecast for 1987 for salaries ($387,000) seemed to justify a salary freeze. He considered that it would be a more practical approach to start with the 1987 total amount and break down into chapter items rather than starting with each item and then building up a total. This view was supported by the Committee Chairman and by Canada.

17.28 The SCRS Chairman was asked for his views regarding the budget proposed by Spain, particularly with regard to the following chapters: Electronic equipment, Port sampling and Biostatistical work. He responded in detail and concluded that the total budget proposed by Spain would be satisfactory, considering present financial constraints, for the SCRS to carry out its assignments.

17.29 The Committee Chairman summed up all the discussions so far. The Executive Secretary referred to the budget proposal presented by Spain and noted that if staff salaries are frozen at the dollar value, this would mean that the staff would continually receive less salary in terms of local currency if the present currency fluctuation trend continues.

17.30 The Delegate of the U.S. repeated the deep concerns expressed earlier. He believed that the proposal made by Spain is reasonable. However, he added that the problem is that if this budget is adopted, the cash which the Commission could expect to receive in the operating year would only be about $500,000. He noted that we should not depend on the Working Capital Fund and added that if this Fund is used to make up the money lacking due to unpaid contributions, by the end of 1988 the Commission will be absolutely broke. Therefore, the Executive Secretary should be in-

structed to keep expenditures within the actual cash received by the Commission.

17.31 The Delegate of Brazil reiterated his previous view that he could not accept any increase in the budget since it will represent a very high increase in his country's contribution. He also pointed out that an increase in country contributions would further discourage countries from paying and would add to the difficulties of those countries who are already in debt to the Commission. He believed that the lack of cash income could be covered by the current Working Capital Fund.

17.32 In response to a question posed by the Delegate of Korea as to how much of a savings the Commission could expect if the Council meets in 1988 instead of the Commission, the Executive Secretary indicated that the cost will be very variable depending on the size of the meeting, the duration of the meeting and the facilities required.

17.33 The Delegate of Côte d'Ivoire proposed that in 1988, only the Standing Committee on Finance and Administration meet, and not the Standing Committee on Research and Statistics. Under this scenario, he proposed that a total 1988 budget broken down as follows:

Salaries-$387,000; Travel-$0; Annual Meeting-$20,000; Publications-$16,000; Office Equipment-$6,000; Operating Expenses-$69,000; Miscellaneous-$5,000;

Chapter 8: a) $110,000; b) $8,000; c) $25,000; d) $10,000; e) $12,500; f) $27,000; g) $10,000; h) $5,000. TOTAL 1988 BUDGET: $710,500

17.34 France agreed, in principle, with Côte d'Ivoire and recognized that the Secretariat's salaries have been regulated by staff regulations and these cannot be changed arbitrarily. He proposed that $387,000 (the amount actually spent on salaries in 1987) be used as a base on which a 6% increase can be applied for 1988 (i.e. $410,000). The total budget proposed by France is as follows:

Salaries-$410,000; Travel-$0; Annual Meeting-$35,000; Publications--$16,000; Office Equipment-$6,000; Operating Expenses-$65,000; Miscellaneous-$5,000;

Chapter 8: a) $106,000; b)$8,000; c) $27,000; d) $10,000; e) $10,000; f) $27,000; g) $5,000; h) $8,000. TOTAL 1988 BUDGET: $738,000.

17.35 The Delegate of Spain expressed that it could include in its proposal the increase in the chapters corresponding to salaries which had been suggested by the U.S. Delegate and supported by the French delegation.

17.36 The Delegate of Canada noted that he would have no difficulty in accepting either the Spanish or French proposed budget, but added that the real problem is: Where is this money coming from? Canada does not believe this figure is realistic because the budget will not be paid if past history is any indication.

17.37 Some discussion followed as to which meeting(s) should be held in 1988. The Chairman of the scientific committee expressed the view that the SCRS should meet every year to maintain its continuity and to update scientific findings since the Commission must rely on a sound scientific base in order to carry out its mandate. This view was strongly supported by Spain.

17.38 Côte d'Ivoire and France were of the opinion that if the Commission makes drastic cuts in the budget, the SCRS should also be affected by these cuts. Besides, the 1987 SCRS Report appears to contain very little changes from the previous year's results. Hence only working groups could meet, if necessary, during 1988, while the Yellowfin Year Program could proceed as planned since it has its own budget. This view was also supported by the U.S.A. as well as Angola. The Delegate of Angola further noted that since the Commission does not have to exercise the imposition or allocation of catch quotas, annual scientific meetings would not be necessary.

17.39 The Executive Secretary noted that a considerable amount of funds allocated to budget Chapters 1 through 7 are spent on matters related to the SCRS and statistical activities, whereas Chapter 8 only includes funds relating to ICCAT's direct involvement with research. Spain agreed with this view but emphasized that if an SCRS meeting were not held, other chapters would also have to be reduced accordingly.

17.40 The U.S. Delegate stated that he could accept the French proposal for the 1988 budget (i.e. $738,000), but with the condition that the Executive Secretary be instructed to spend only the amount of contributions actually received. Therefore, he recommended that the Commission's financial status be assessed in mid-1988. If, at that time, there is a shortage of cash foreseen, then the Executive Secretary, in consultation with the Commission and STACFAD Chairmen, should initiate steps to meet the shortfall, i.e. termination of some staff, etc. The Working Capital Fund could be used to pay termination payments for staff.

17.41 The Delegate of Portugal reiterated the concern expressed by the U.S. that even if the budget is agreed upon, the money does not exist. He recognized that the total amounts proposed by several countries are within a similar range. Because of the shortage of time to complete the Committee's work, the Portuguese Delegate proposed forming an ad hoc group to study the 1988 budget.

17.42 The Delegate of São Tomé & Principe shared the view expressed by Brazil that if the budget is increased considerably it would impose more hardship on some countries to pay their contributions. He also supported Portugal's proposal that a small working group be set up comprised of countries whose proposals are similar and who might therefore reach a concensus more easily.

17.43 The Commission Chairman addressed the Committee and expressed his understanding of the difficulties involved. He wondered whether a small group speaking several different languages could make more progress than had been made at the full session. He reminded the Committee that there are still a number of items to be addressed by the Committee. He warned that if

the Committee could not complete its work in its remaining session, he would have to ask that the Committee meeting be suspended and the work of the Commission resumed. In that case a special session of STACFAD might be needed to complete the assignments given to the Committee. He noted that each member country has its instructions concerning an acceptable maximum budget. As was pointed out many times, we know that not all the assessments will be received and therefore the situation must be dealt with realistically with an amount which results from real income. Therefore, every country knows the limits of its ability to participate. While apologizing for the length of his intervention, the Commission Chairman appealed to the Committee to give it one last try.

17.44 The STACFAD Chairman proposed that the Committee meet in a close-door, restricted session with participation by Commission members only. The Committee approved this proposal and a closed session of STACFAD was held.

17.45 At a later, open session of the Committee, the Chairman reported on the results of the deliberations held during the closed session of STACFAD. She noted that it was a very complicated meeting and that numerous comments were made. She presented a budget totaling $735,000, broken down by chapters, which is attached herewith as Appendix 2.

17.46 Special Rules of Procedure for Implementing the 1988 Budget were proposed in conjunction with the Budget. After some amendments were made to the original proposal, they were recommended to the Commission for adoption and are attached as Appendix 3.

17.47 It was noted that suspension of Rule 39 of the Secretariat Staff Rules, as indicated in Appendix 3, should not apply to port samplers who are part-time employees. France added that funding for port samplers is covered under Chapter 8-c, and not under Chapters 1 or 8-a. The SCRS Chairman also commented that the provision made for biostatistical work should also be free from this restriction. The Committee was informed that the freeze on hiring staff applied only to Chapters 1 and Chapter 8-a of the budget.

17.48 While the Committee Chairman recognized the efficient work carried out by the Secretariat staff over the years, she emphasized the difficulties of some member countries in supporting even a moderate increase in the budget. Therefore, she noted that if contributions are not received from some member countries, and if the currency exchange rate continues its current unfavorable trend, then the Executive Secretary is authorized to take any necessary steps.

17.49 Other means to supplement Commission income were suggested in the closed Committee session, including charging for publications. Some delegates felt that all costs (printing, paper, mailing, etc.) should be taken into account in establishing the price for publications.

17.50 Observer registration fees (e.g. $1,000 per person) were also considered at the closed session. The STACFAD Chairman clarified that these fees should apply to Commission meetings, and not to the SCRS. Several delegations expressed their reservations on observer fees. It was noted

that some other organization charge a registration fee even to the member countries when their delegations exceed a certain number of people (e.g. four). However, the Chairman added that this matter could not be discussed at this time since it had not been included in the Agenda circulated 60 days prior to the Meeting.

17.51 Spain proposed a 1989 budget totaling $750,000, which shows a 2% increase in the total budget over the 1988 figure. However, it was clarified that the 1989 budget does not really show an increase since it includes funds for home leave expenses which certain staff members are entitled to in 1989. The Chairman suggested this proposal as a base figure for 1989.

17.52 Canada pointed out that the matter first required a decision on whether we plan to hold a Commission or Council meeting in 1988, since the functions of the Council are very limited. He referred the Committee to Rule 9 of the Rules of Procedure, and noted that the Council cannot make significant decisions on Commission administration or finance. The Delegate of Canada indicated that he would not want to see budgetary decisions left to the Council since it can only be comprised of a maximum of eight member countries. He emphasized that if the Council does meet, then the 1989 budget must be carefully studied at this time. This view was supported by Côte d'Ivoire and Brazil.

17.53 Côte d'Ivoire proposed that a special meeting of the Commission be held in 1988. Spain supported the Côte d'Ivoire proposal, but added that considering very few funds are available, the Commission meeting should be short, about three days. The Delegate of Japan emphasized that the Commission, even though it is holding a short meeting, should deal with all Commission business, which should be included on the Agenda. This was confirmed by the Committee.

17.54 The Delegate of the U.S. commented that the 1989 budget proposed by Spain seems reasonable. However, he requested that $750,000 be the maximum amount, subject to review based on 1988 spending levels. France also supported the budget proposal by Spain for 1989.

17.55 Brazil reiterated his country's difficulties in accepting an increase in the budget which would mean higher country contributions. Therefore, he could not support another increase in 1989 budget and proposed that we maintain a global figure of $735,000 for 1989. He added that the Committee can revise the budget either upward or downward at the meeting of the Commission to be held in 1988. This view was supported by Cuba.

17.56 In supporting the Spanish proposal, Côte d'Ivoire asked how the $36,000 for electronic equipment would be used, and if the initial computer selection was inadequate. This view was also expressed by the Delegate of Cuba. The SCRS Chairman referred the Committee to the SCRS Report and explained in detail why an expansion of memory capacity was warranted.

17.57 The Delegate of Canada requested that the wording be aligned for Chapters 1 and 8-a, i.e. that the word "Salaries" be used for both chapters.

17.58 France proposed that a footnote be added to Chapter 8-e of the 1989 budget to the effect that in adopting the provisional budget for 1989 the Commission considers that the figure of $36,000 can be decreased and asked that the difference between the forecast figure and the actual expense cannot be transferred to another budget chapter. This proposal was supported by Spain.

17.59 The Committee recommended that the Commission adopt the 1988 and 1989 Budgets with the reservation that the 1989 Budget be reviewed at the Special Meeting of the Commission in 1988, taking into account the financial status of the Commission at that time. The proposed Budget is attached as Appendix 2.

## ITEM 18. MEMBER COUNTRY CONTRIBUTIONS TO THE 1988-1989 BUDGET

18.1 A table showing catch and canning figures officially submitted to the Secretariat was reviewed. Based on 1985 catch and canning figures the country contributions were calculated for the 1988 and 1989 Budgets. The table showing these contributions is attached as Appendix 4 to this Report.

18.2 The Committee recommended these contributions for adoption by the Commission.

## ITEM 19. STUDY OF THE BASES FOR CALCULATING THE CONTRIBUTIONS OF THE MEMBER COUNTRIES

19.1 Due to the lack of time available to the Committee, this Agenda item was referred to the Commission for discussion.

## ITEM 20. RECOMMENDATIONS FOR RESEARCH AND STATISTICS

20.1 The Chairman of STACFAD noted that the 1988-1989 Budgets clearly indicate the priorities for SCRS research in the next biennial period.

## ITEM 21. DATE AND PLACE OF NEXT MEETING OF THE COUNCIL OR SPECIAL MEETING OF THE COMMISSION

21.1 It was recommended that a special meeting of the Commission be held in Madrid in 1988 for a duration of three weekdays (i.e. Monday to Wednesday).

21.2 The SCRS Chairman showed preference for holding his Committee's meeting consecutive to the Commission meeting. The Delegate of Canada noted that holding separate meetings gave his commissioners a good opportunity to review the results of SCRS scientific findings. The U.S. felt that holding consecutive meetings would represent a savings to the member countries in terms of travel funds, etc. The Delegates of Côte d'Ivoire and Angola also supported consecutive meetings.

21.3 Although the SCRS had recommended that a meeting of nine working days (Wednesday through Friday of the following week) be held in 1988, the

SCRS Chairman realized that, due to budgetary constraints, the Committee could meet from Wednesday to Thursday of the following week.

21.4 The Committee recommended the following dates for the 1988 Meetings: November 2 to 10 for the SCRS Meeting and November 14 to 16 for the Commission meeting.

ITEM 22. ITEMS TO BE CONSIDERED BY THE COUNCIL AT ITS NEXT MEETING

22.1 Since the Council will not be meeting in 1988, the Committee felt it was unnecessary to discuss this Agenda item.

ITEM 23. DATE AND PLACE OF NEXT REGULAR MEETING OF THE COMMISSION

23.1 This matter was referred to the Special Meeting of the Commission scheduled for 1988.

ITEM 24. ELECTION OF CHAIRMAN OF THE COMMITTEE

24.1 France nominated the current Chairman, Mrs. P. García Doñoro, for re-election to another term, and commended her efficient handling of the Committee's matters. He noted the need for continuity in monitoring the difficulties now facing the Commission. This nomination was supported by many delegations and Mrs. García Doñoro was unanimously re-elected Chairman of the Standing Committee on Finance and Administration.

ITEM 25. OTHER MATTERS

25.1 No other matters were discussed.

ITEM 26. ADOPTION OF REPORT

26.1 The Report was adopted.

ITEM 27. ADJOURNMENT

27.1 The meeting was adjourned.

## STACFAD Agenda

1. Opening of the meeting
2. Adoption of Agenda
3. Election of Rapporteur
4. Commission and Panel membership
5. Ratification of the Protocol to the Convention
6. Coordination of research
7. Relations with other organizations
8. Commission publications
9. Meetings during the year
10. Other administrative matters
11. Auditor's Report - 1986
12. Financial status of the second half of the biennial budget (1987)
13. Financial status of the Yellowfin Year Program
14. Trust Fund for the Enhanced Billfish Research Program
15. Pending contributions of the member countries
16. Working Capital Fund
17. Budget for the biennial period 1988-1989
18. Member country contributions to the 1988-1989 Budget
19. Study of the bases for calculating the contributions of the member countries
20. Recommendations for research and statistics
21. Date and place of the next meeting of the Council or special meeting of the Commission
22. Items to be considered by the Council at its next meeting
23. Date and place of the next regular meeting of the Commission
24. Election of the Chairman of the Committee
25. Other matters
26. Adoption of Report
27. Adjournment

## Estimated Regular Budget, 1988-1989 (US $)

| Chapter | 1988 (735,000) | 1989 (750,000) |
|---|---|---|
| 1. Salaries | 386,000 * | 386,000 |
| 2. Travel | 0 | 12,000 |
| 3. Annual Commission meeting | 15,000 | 22,000 |
| 4. Publications | 16,000 | 16,000 |
| 5. Office Equipment | 6,000 | 8,000 |
| 6. Operating Expenses | 65,000 | 67,000 |
| 7. Miscellaneous | 5,000 | 5,000 |
| Sub-total | 493,000 | 516,000 |
| 8. Coordination of Research | | |
| a) Salaries | 100,000 * | 105,000 |
| b) Travel for improvement of statistics | 8,000 | 6,000 |
| c) Port sampling | 27,000 | 20,000 |
| d) Biostatistical work | 10,000 | 8,000 |
| e) Electronic equipment | 10,000 | 36,000 ** |
| f) Data processing | 27,000 | 27,000 |
| g) Scientific meetings (including SCRS) | 25,000 | 28,000 |
| h) Miscellaneous | 35,000 | 4,000 |
| i) Billfish Program | 0 *** | 0 *** |
| Sub-total | 242,000 | 234,000 |
| TOTAL | 735,000 | 750,000 |

* The amounts corresponding to chapters 1 and 8-a could be revised, in view of the evolution of U.S. dollar exchange rate.

** This figure of $36,000 for 1989 could be reduced but the reduction should not be reallocated to other budget chapters.

*** Funded by the Trust Fund for Billfish Research.

## Special Rules of Procedures for Implementing the 1988 Budget

Notwithstanding the Staff Rules, beginning January 1, 1988, salaries will be frozen at the November 1, 1987, level and during this same year Articles 10 and 39 of the Staff Rules will not be applied.

The Executive Secretary will assess as of August 1, 1988, the status of contributions received. If contributions have not been received as of that date as anticipated in approving a budget of $735,000, the following steps will be taken.

1. The Executive Secretary is authorized to draw from the Working Capital Fund an amount sufficient to sustain Commission activities as planned, however, such amount shall not exceed a sum that would reduce the Working Capital Fund total balance below $70,000.

2. If adequate funding is not provided through 1) above, then the Executive Secretary will take all possible steps to reduce operating costs to as great an extent as possible through administrative actions. He shall consult the Chairman of the SCRS.

3. If steps 1) and 2) above are not adequate to sustain Commission operations as planned, the Executive Secretary is directed to initiate, after consultation with the Chairmen of the Commission and STACFAD, steps to reduce staff salary expenditures in accordance with ICCAT staff rules. Such steps will include reduced working schedules, and/or staff reductions.

Table of member country contributions to the Regular Commission Budget - 1988 (US$)

| | | | TOTAL BUDGET = | $735,000.00 | | CONTRIBUTION (K)= | $735,000.00 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | I | J | K |
| COUNTRY | # | % | (MT) | (MT) | (MT) | % | $ | $ | $ | $ | $ |
| Angola | 2 | 5.00 | 2,124 | 703 | 2,827 | 0.46 | 1,000 | 2,000 | 11,250 | 2,074 | 16,324 |
| Benin | 0 | 1.67 | 392 | 0 | 392 | 0.06 | 1,000 | 0 | 3,750 | 288 | 5,038 |
| Brazil | 2 | 5.00 | 32,954 | 2,312 | 35,266 | 5.75 | 1,000 | 2,000 | 11,250 | 25,872 | 40,122 |
| Canada | 2 | 5.00 | 741 | 3,333 | 4,074 | 0.66 | 1,000 | 2,000 | 11,250 | 2,989 | 17,239 |
| Cape Verde | 1 | 3.33 | 4,335 | 206 | 4,541 | 0.74 | 1,000 | 1,000 | 7,500 | 3,331 | 12,831 |
| Cuba | 2 | 5.00 | 8,846 | 859 | 9,705 | 1.58 | 1,000 | 2,000 | 11,250 | 7,120 | 21,370 |
| Equatorial Guinea | 0 | 1.67 | 0 | 0 | 0 | 0.00 | 1,000 | 0 | 3,750 | 0 | 4,750 |
| France | 2 | 5.00 | 30,219 | 25,000 | 55,219 | 9.00 | 1,000 | 2,000 | 11,250 | 40,511 | 54,760 |
| Gabon | 1 | 3.33 | 0 | 0 | 0 | 0.00 | 1,000 | 1,000 | 7,500 | 0 | 9,500 |
| Ghana | 1 | 3.33 | 44,158 | 1,798 | 45,956 | 7.49 | 1,000 | 1,000 | 7,500 | 33,715 | 43,215 |
| Ivory Coast | 1 | 3.33 | 1,386 | 1,200 | 2,586 | 0.42 | 1,000 | 1,000 | 7,500 | 1,897 | 11,397 |
| Japan | 4 | 8.33 | 54,099 | 0 | 54,099 | 8.82 | 1,000 | 4,000 | 18,750 | 39,689 | 63,439 |
| Korea | 3 | 6.67 | 17,704 | 0 | 17,704 | 2.89 | 1,000 | 3,000 | 15,000 | 12,988 | 31,988 |
| Morocco | 2 | 5.00 | 1,928 | 242 | 2,170 | 0.35 | 1,000 | 2,000 | 11,250 | 1,592 | 15,842 |
| Portugal | 3 | 6.67 | 9,655 | 4,282 | 13,937 | 2.27 | 1,000 | 3,000 | 15,000 | 10,225 | 29,225 |
| S Tome & Principe | 0 | 1.67 | 215 | 0 | 215 | 0.04 | 1,000 | 0 | 3,750 | 158 | 4,908 |
| Senegal | 1 | 3.33 | 12,076 | 4,282 | 16,358 | 2.67 | 1,000 | 1,000 | 7,500 | 12,001 | 21,501 |
| South Africa | 1 | 3.33 | 5,856 | 91 | 5,947 | 0.97 | 1,000 | 1,000 | 7,500 | 4,363 | 13,863 |
| Spain | 3 | 6.67 | 156,281 | 59,990 | 216,271 | 35.26 | 1,000 | 3,000 | 15,000 | 158,664 | 177,663 |
| U.S.A. | 4 | 8.33 | 18,306 | 47,477 | 65,783 | 10.72 | 1,000 | 4,000 | 18,750 | 48,261 | 72,011 |
| U.S.S.R. | 2 | 5.00 | 15,496 | 810 | 16,306 | 2.66 | 1,000 | 2,000 | 11,250 | 11,963 | 26,213 |
| Uruguay | 0 | 1.67 | 4,410 | 0 | 4,410 | 0.72 | 1,000 | 0 | 3,750 | 3,235 | 7,985 |
| Venezuela | 0 | 1.67 | 22,733 | 16,884 | 39,617 | 6.46 | 1,000 | 0 | 3,750 | 29,064 | 33,814 |
| TOTAL | 37 | 100 | 443,914 | 169,469 | 613,383 | 100.00 | 23,000 | 37,000 | 225,000 | 450,000 | 735,000 |

A - Panel membership.
B - Percentage of payments for annual membership and panel membership (G+H).
C - Catch (live weight) - 1985
D - Canned production (net product weight) -- 1985
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 (Total contribution less G+H) distributed percentage-wise according to column B.
J - 2/3 of (Total contribution less G+H) distributed percentage-wise according to column F.
K - Total (G+H+I+J)

Table of member country contributions to the Regular Commission Budget - 1989 (US$)

| | | | TOTAL BUDGET = | $750,000.00 | | CONTRIBUTION (K)= | $750,000.00 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | I | J | K |
| COUNTRY | # | % | (MT) | (MT) | (MT) | % | $ | $ | $ | $ | $ |
| Angola | 2 | 5.00 | 2,124 | 703 | 2,827 | 0.46 | 1,000 | 2,000 | 11,500 | 2,120 | 16,620 |
| Benin | 0 | 1.67 | 392 | 0 | 392 | 0.06 | 1,000 | 0 | 3,833 | 294 | 5,127 |
| Brazil | 2 | 5.00 | 32,954 | 2,312 | 35,266 | 5.75 | 1,000 | 2,000 | 11,500 | 26,447 | 40,947 |
| Canada | 2 | 5.00 | 741 | 3,333 | 4,074 | 0.66 | 1,000 | 2,000 | 11,500 | 3,055 | 17,555 |
| Cape Verde | 1 | 3.33 | 4,335 | 206 | 4,541 | 0.74 | 1,000 | 1,000 | 7,667 | 3,405 | 13,072 |
| Cuba | 2 | 5.00 | 8,846 | 859 | 9,705 | 1.58 | 1,000 | 2,000 | 11,500 | 7,278 | 21,778 |
| Equatorial Guinea | 0 | 1.67 | 0 | 0 | 0 | 0.00 | 1,000 | 0 | 3,833 | 0 | 4,833 |
| France | 2 | 5.00 | 30,219 | 25,000 | 55,219 | 9.00 | 1,000 | 2,000 | 11,500 | 41,411 | 55,910 |
| Gabon | 1 | 3.33 | 0 | 0 | 0 | 0.00 | 1,000 | 1,000 | 7,667 | 0 | 9,667 |
| Ghana | 1 | 3.33 | 44,158 | 1,798 | 45,956 | 7.49 | 1,000 | 1,000 | 7,667 | 34,464 | 44,131 |
| Ivory Coast | 1 | 3.33 | 1,386 | 1,200 | 2,586 | 0.42 | 1,000 | 1,000 | 7,667 | 1,939 | 11,606 |
| Japan | 4 | 8.33 | 54,099 | 0 | 54,099 | 8.82 | 1,000 | 4,000 | 19,167 | 40,571 | 64,738 |
| Korea | 3 | 6.67 | 17,704 | 0 | 17,704 | 2.89 | 1,000 | 3,000 | 15,333 | 13,277 | 32,610 |
| Morocco | 2 | 5.00 | 1,928 | 242 | 2,170 | 0.35 | 1,000 | 2,000 | 11,500 | 1,627 | 16,127 |
| Portugal | 3 | 6.67 | 9,655 | 4,282 | 13,937 | 2.27 | 1,000 | 3,000 | 15,333 | 10,452 | 29,785 |
| S Tome & Principe | 0 | 1.67 | 215 | 0 | 215 | 0.04 | 1,000 | 0 | 3,833 | 161 | 4,995 |
| Senegal | 1 | 3.33 | 12,076 | 4,282 | 16,358 | 2.67 | 1,000 | 1,000 | 7,667 | 12,268 | 21,934 |
| South Africa | 1 | 3.33 | 5,856 | 91 | 5,947 | 0.97 | 1,000 | 1,000 | 7,667 | 4,460 | 14,127 |
| Spain | 3 | 6.67 | 156,281 | 59,990 | 216,271 | 35.26 | 1,000 | 3,000 | 15,333 | 162,190 | 181,522 |
| U.S.A. | 4 | 8.33 | 18,306 | 47,477 | 65,783 | 10.72 | 1,000 | 4,000 | 19,167 | 49,333 | 73,500 |
| U.S.S.R. | 2 | 5.00 | 15,496 | 810 | 16,306 | 2.66 | 1,000 | 2,000 | 11,500 | 12,229 | 26,729 |
| Uruguay | 0 | 1.67 | 4,410 | 0 | 4,410 | 0.72 | 1,000 | 0 | 3,833 | 3,307 | 8,141 |
| Venezuela | 0 | 1.67 | 22,733 | 16,884 | 39,617 | 6.46 | 1,000 | 0 | 3,833 | 29,710 | 34,544 |
| TOTAL | 37 | 100 | 443,914 | 169,469 | 613,383 | 100.00 | 23,000 | 37,000 | 230,000 | 460,000 | 750,000 |

A - Panel membership.
B - Percentage of payments for annual membership and panel membership (G+H).
C - Catch (live weight) - 1985
D - Canned production (net product weight) -- 1985
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 (Total contribution less G+H) distributed percentage-wise according to column B.
J - 2/3 of (Total contribution less G+H) distributed percentage-wise according to column F.
K - Total (G+H+I+J)

# PROPOSAL BY COTE D'IVOIRE ON THE BASIS FOR CALCULATING THE ICCAT MEMBER COUNTRY CONTRIBUTIONS

Since its creation in 1966 and thanks to the good will of the countries which comprise it and to the competence of its Executive Secretary, ICCAT has successfully carried out its basic statutory missions. ICCAT can be cited as an example for other similar organizations. This international notoriety is due above all to the quality and qualifications of the people who are dedicated to the Commission's work and to the financial means at its disposition.

But since the beginning of the 1980's and particularly since 1983, the Commission has been facing a financial crisis which has become accentuated with the passing of the years and risks compromising the future of the Commission.

The object of this proposal by Côte d'Ivoire is to summarize briefly the causes of this crisis and to suggest some direction to resolve the financial crisis facing our Commission, whose importance is recognized by all of us.

## Analysis of the financial situation and its consequences

The status of the member country contributions has been described many times by the Secretariat and has been the subject of many meetings and discussions at different decision-making levels of the Commission.

It is sufficient to recall that in September, 1986, a Working Group met in special session to study the financial problems of the Commission in view of the gravity of the situation caused by the pending member country contributions. At this meeting, the Group noted the increasing accumulation of arrearages and at that time expressed its concern.

To date, the situation, far from improving, has become even worse. the contributions pending from the 1987 budget or from previous years correspond to the following countries: Benin, Brazil, Cape Verde, Cuba, Gabon, Ghana, Côte d'Ivoire, Morocco, Portugal, São Tomé and Principe, Senegal, Uruguay and Venezuela, and reach a total of $527,782.50, equivalent to nearly a year's budget for our Commission.

## Consequences

We note that the financial resources of the Commission essentially come from member country contributions. If non-payment of these contributions

continues, it will reduce in the short term the activities of the Commission (reductions in scientific activities, personnel and in the operation of the Secretariat) and in the medium term could lead to the disappearance of the Commission. This would be detrimental not only for the member countries but also for the rational exploitation of tuna resources when the scientific experience gained through the study and thorough knowledge of these resources is taken into account.

As written 230 years ago by the Spanish Dominican monk Brother Martin Sarmiento, "We know that tuna have no fixed homeland nor country. The entire ocean is their home." This is to say that research on these species is very complex and requires the collaboration of many teams of scientific specialists working together in common programs. The financial resources and personnel required exceed the possibilities of a single country. Close international cooperation is imperative in order to establish common effective protection measures. This means that our Commission is more than necessary. It is absolutely essential.

## Causes for the crisis

The causes are basically of two types:

### --The new regulatory system for oceans

It must be recognized that since 1968, date of the adoption of the first budget which began the activities of the Commission, the various factors forming the foundation of certain provisions in the Convention have evolved, especially as concerns the regulatory system for oceans and their resources.

It is recognized that fish ignore political and often material boundaries drawn by man on the ocean; this is particularly true for the species covered by the ICCAT Convention, tunas and tuna-like species in the Atlantic.

However, taking into account the new ocean policies, the major part of the tuna resource remains longer and migrates widely within the EEZ of the countries bordering the large fishing zones. As proof, it can be seen in the FAO statistics that more than 60 percent of the catches of these species are taken within these EEZs.

### --The international financial crisis

It is true that this financial crisis which has been occurring since the beginning of the 1970's affects all the countries; it must also be recognized that it affects even more the developing countries where nearly the entire economy is based on agricultural and mineral products. For these countries, the financial difficulties are accentuated even more so that they find it even more difficult to meet their national and international commitments, and they are forced to turn to increasing their foreign debt or to suspending payments.

The policy of following an austerity budget adopted in these developing countries has led to redefining priorities, unfortunately to the detriment of other sectors not less important, within which can be found the financial participation in international organizations.

## Proposal

Taking into account the above factors, the Ivorian proposal tries on the one hand to make a distinction between the industrialized countries and the developing countries among the Contracting Parties of the Convention and on the other hand to have adopted a system for calculating the contributions which would substantially reduce the proportion of the developing countries, in view of the economic reality of those countries.

--The developing countries could pay a symbolic amount for being a member of the Commission and an amount for being a member of each Panel.

This is a proposal which, if it obtains the support of the majority of the member countries and particularly of the developing countries, could be the subject of discussion of a working group.

--If this proposal is accepted, the form and the implications would be examined in detail by the working group.

--In practice, this would have to be an amendment to Article X of the Convention, in order to limit the contributions of developing countries to only paragraphs (a) and (b) of this article, of course, respecting the rules of procedure.

## Conclusion

The Ivorian proposal does not have the intention either to be exhaustive or to exclude any other proposal which attempts to resolve a financial crisis whose causes are well known.

Côte d'Ivoire is willing to discuss any other proposal.

However, we are convinced that the solution to the present crisis should ensure the financial resources of the Commission and also allow the participation of all the countries interested in tunas, regardless of their level of development.

In the present situation, it is not desirable for anyone to make the Commission a closed club reserved only for industrialized countries. On the contrary, it should be a platform for international cooperation where the dignity of some and the interests of others must be respected.

This is why any realistic attempt which takes into account this principle should be encouraged.

Côte d'Ivoire is willing to contribute its modest collaboration in search of a solution.

# REPORT OF THE STANDING COMMITTE ON RESEARCH AND STATISTICS (SCRS)

Madrid, Octubre 14-22, 1987

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## Item 1. OPENING OF THE MEETING

The Standing Committee on Research and Statistics (SCRS) met in Madrid, Spain, at the Hotel Velázquez, from October 14 to 22, 1987, under the chairmanship of Mr. A. González-Garcés (Spain).

The SCRS Chairman opened the Eighteenth Regular Meeting of the Committee and welcomed all the scientific delegations. A special welcome was given to the delegates from Equatorial Guinea, which became a member of the Commission since the last session of the Committee. Mr. González-Garcés reviewed the achievements made in tuna research by the scientists during 1987, and referred to the various intersessional meetings and the meetings at which ICCAT was represented.

He commented that this year the SCRS is meeting separately from the Commission and some time in advance. This is to meet the scientists' need to use the computer located at the Headquarters. He also noted that the Swordfish Workshop, which was originally proposed as an inter-sessional meeting, met just prior to this SCRS session. He suggested evaluating this new scheme at the end of the session in light of our experience this year in order to improve our work in the future.

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

The Tentative Agenda, circulated prior to the meeting, was adopted and is attached as Appendix 1. The scientists nominated as rapporteurs of the Report are as follows:

For Agenda Item 9:

| | |
|---|---|
| Tropical Tunas | A. Fonteneau (General), F. X. Bard (YFT), S. Kume (BET), P. Pallarés (SKJ) |
| ALB - Albacore | J. Mejuto |
| BFT - Bluefin tuna | D. Clay, R. Conser, B. Liorzou, J. L. Cort |
| BIL - Billfish | E. Prince |
| SWO - Swordfish | J. C. Rey |
| SBF - Southern bluefin | S. Kume |
| SMT - Small tunas | T. Diouf |
| MLT - Multi-Species | A. Fonteneau |
| All Agenda items except 9: | P. M. Miyake |

## Item 3. INTRODUCTION OF DELEGATIONS

Each member country introduced its scientific delegation. The List of Participants is attached as Appendix 2.

## Item 4. ADMISSION OF OBSERVERS

The observers, as shown in the List of Participants, were introduced, admitted and welcomed to the 1987 SCRS Meeting.

## Item 5. ADMISSION OF SCIENTIFIC PAPERS

The Chairman reviewed the guidelines established for accepting SCRS papers. The Committee was informed that all the documents submitted this year met the criteria set up by the SCRS. However, it was reported that the reduction in the required number of copies from 80 to 65 may result in a shortage in some of the documents since participation at the scientific meetings is quite high. The Committee recommended that next year the Secretariat request 80 copies of each document when these are brought just before the meeting. The List of SCRS Documents is attached as Appendix 3.

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

### 6.1 ANGOLA

No report was submitted.

### 6.2 BENIN

No report was submitted.

## 6.3 BRAZIL

No report was submitted.

## 6.4 CANADA

Fishing effort of the domestic inshore Atlantic bluefin tuna fishery has remained stable over the past few years. This is due to strict conservation measures imposed upon this fishery by the Department of Fisheries and Oceans.

Landings of the domestic inshore bluefin fishery were greatly reduced in 1986 (97 fish, 41.3 MT); total landings including an offshore charter vessel were 440 fish weighing 73.4 MT. Canadian fishermen are, for the first time, reporting reduced visual observations of giant bluefin.

The reduced tuna landings have made biological sampling difficult; sampling of foreign flag vessels within the Canadian economic zone (200 miles) is continuing. The reduction to less than 10 percent of the bluefin landings of three years ago is more than even the most pessimistic outlook of past bluefin working groups would have suggested. The economic hardships this reduced catch has imposed have led the Department to permit several "experimental" fisheries for 1987.

Landings of swordfish are up by approximately 400 MT to 985 MT in 1986. Additional licenses have been issued in 1987 in anticipation of continued improved landings of swordfish.

## 6.5 CAPE VERDE

Tuna fishing in Cape Verde is carried out by small vessels, baitboats and beach seines. As in 1985, yellowfin catches by small vessels and baitboats showed a slight increase in 1986. Skipjack catches decreased due to bait problems.

Cape Verde has tried to meet ICCAT's requests for statistics. Intensive size sampling of yellowfin caught by small boats and gonad sampling have been carried out in 1986-1987 for the Yellowfin Year Program.

Regulations concerning yellowfin and bigeye tunas have been published.

## 6.6 COTE D'IVOIRE

No report was submitted.

## 6.7 CUBA

No report was submitted.

## 6.8 EQUATORIAL GUINEA

No report was submitted.

## 6.9 FRANCE

French catches in 1986 reached 36,500 MT, of which 5,000 MT were temperate tunas (albacore and bluefin) and 31,500 MT were tropical tunas (yellowfin, skipjack and bigeye). The major part of the French purse seine fleet operated in the Indian Ocean in 1986 and continued to exert very reduced fishing effort in the Atlantic.

Research conducted by IFREMER on temperate tunas continued in 1986. Analysis continued on the relationship between oceanographic conditions and catchability of the albacore stock taken by trolling. French research on tropical tunas is carried out by ORSTOM in cooperation with Senegal, Côte d'Ivoire and Venezuela. Data collection and sampling of the French fleet was carried out as well as diverse analyses on the biology and population dynamics of Atlantic tunas.

Special effort was devoted in 1986 to the study of the yellowfin stock as regards current status of the stock. A French scientist has coordinated research carried out in 1986 and 1987 for the Yellowfin Year Program. The French research vessel "Nizery" has carried out six tagging cruises in 1986 and 1987 within the framework of the Yellowfin Program.

## 6.10 GABON

No report was submitted.

## 6.11 GHANA

No report was submitted.

## 6.12 JAPAN

Total Japanese catches of Atlantic tunas and billfishes in 1986 were estimated to be 39,000 MT, of which 33,200 MT were taken by the longline fishery covering a very wide area of the Atlantic, and 5,800 MT by the purse seine fishery in the Gulf of Guinea. The longline catch decreased to about 68 percent compared to the 1985 catch, due to the decrease in the number of longliners operating in the Atlantic. Bigeye tuna accounted for the major portion of the longline catch (69 percent), followed by yellowfin tuna (10 percent) and swordfish (7 percent). The catch of tropical tunas made by two purse seiners was a little more than the 1985 catch.

In both 1986 and 1987, a governmental patrol boat was dispatched to the northeastern Atlantic including the Mediterranean Sea during May-July to monitor the longline fleet for the purpose of complying with the ICCAT regulation on bluefin tuna.

The Far Seas Fisheries Research Laboratory continued to collect and compile Atlantic tuna fishery data, and submitted the statistics assigned by the SCRS to ICCAT. The laboratory concentrated recent research activities on stock assessment work on bluefin and bigeye tunas and swordfish. Seven research documents were presented to the SCRS in 1987.

## 6.13 KOREA

The total number of Korean longliners operating in the Atlantic Ocean decreased to 28 vessels in 1986 from 45 vessels in 1985. No baitboat has been operating since April, 1985. The total catch of tuna and tuna-like fishes amounted to 9,964 MT in 1986, which shows a decrease of 42.9 percent compared to the 1985 catch. Bigeye tuna was still one of the major species in 1986 and comprised 61 percent (6,084 MT) of the total catch. Yellowfin and albacore were caught incidentally, amounting to 1,818 MT and 694 MT, respectively.

The National Fisheries Research and Development Agency (NFRDA) has been in charge of collecting and processing Atlantic fishing data, which have been routinely submitted to ICCAT.

The coverage rate for catch and effort data in 1986 was 71.9 percent, the highest level in the Korean longline fishery in the Atlantic.

## 6.14 MOROCCO

No report was submitted.

## 6.15 PORTUGAL

Portuguese catches of tunas and tuna-like species in 1986 reached 13,996 MT, of which 7,153 MT were bigeye, 5,362 MT were skipjack, 498 MT were albacore and 983 MT were of other species. The 1986 bigeye and skipjack catches represent the highest catches of these species in recent years. This increase in catches is due to the increased catches in the Azorean tuna fishery, which rose from 7,600 MT in 1985 to 11,200 MT in 1986.

Preliminary estimates of catches during the first three quarters of 1986 indicate a catch of 700 MT in Madeira and 11,100 MT in Azores.

As concerns the development of the fleet in 1986 and 1987, nine new freezer baitboats began operating in the Azores Islands. Other new baitboats are planned to be put into operation in 1988.

Two new surface longline fisheries targeting swordfish were recently started in continental Portugal and Azores. Experimental fishereis in contental EEZ targeting swordfish started in 1985. According to the results obtained, a commercial fishery was increased, and is now comprised of 20 boats using surface longline and operating from April up to November. The Azorean fishery was preceded by experimental fisheries in 1985 and 1986.

The Azorean longline fleet was comprised of 10 boats as of September, 1987. A sport fishery targeting blue marlin has been developing in the Azores since 1984 and presently this fleet is comprised of six speed boats.

As regards research, sampling activities and the collection of statistics have continued as in the past. A research cruise, studying swordfish and tuna, took place in 1987 in the continental EEZ; another cruise is planned for 1988. Research activities are especially centered on evaluations of the bigeye stock.

### 6.16 SAO TOME AND PRINCIPE

No report was submitted.

### 6.17 SENEGAL

The tuna fleet based at Dakar was comprised of 19 baitboats and 4 purse seiners in 1986. The overall total catches by these boats in 1986 (11,876 MT) was less than the 1985 total (-3,070 MT). This decrease is explained by the late start of the fishing season and by a decrease in fishing effort observed for both the baitboats (-28 percent) and the purse seiners (-9 percent). Landings and transshipments by fleets not based in Dakar (basically Spanish and French,) reached 25,920 MT in 1986, which were similar to those of 1985 (25,440 MT).

The catch of small tunas of all species and by all fisheries (artisanal and commercial) combined reached 6,100 MT, which was a slight increase compared to 1985 (+240 MT). The global catch of sailfish in 1986 has strongly increased as compared to 1985 (from 100 MT to 610 MT).

As regards research led by French scientists based in the laboratory, tagging cruises were conducted in 1986 and a total of about 1,230 individuals of all tuna species combined were tagged. The recoveries of tags released during these cruises were analyzed as they were received. Sampling was also continued in order to complete the biological data, in particular on the small coastal tunas. Research on the structure and state of the stocks was also carried out and the results obtained were reported to the SCRS.

### 6.18 SOUTH AFRICA

No report was submitted.

### 6.19 SPAIN

Spanish catches of tunas and tuna-like species in the Atlantic and Mediterranean in 1986 remained at the same level as that of the previous year (154,507 MT), which was only 1.1 percent less than in 1985. Catches in the Atlantic made up 97.8 percent of the total catch; the remainder was taken in the Mediterranean.

Catches of tropical tunas remained at practically the same level as in 1985, as did albacore and swordfish catches. The catches of small tunas decreased by 2000 MT and Spanish traps also reduced their catches of bluefin.

The catches, by species, were: yellowfin (62,100 MT), skipjack (40,600 MT), albacore (22,100 MT), bigeye (12,000 MT), swordfish (9,200 MT), small tunas (5,300 MT) and bluefin (3,200 MT).

Spanish research activities were directed at the most important species. Research carried out in the tropical area in 1986 included three cruises on board freezer tuna fishing vessels. In the temperate area three tagging cruises were conducted: one in the area of the Canary Islands, and two in the Bay of Biscay. No tagging cruises were carried out in either zone in 1987.

Preparatory work for the Swordfish Workshop in 1987 included several research projects over the last two years concerning swordfish.

## 6.20 UNITED STATES

Total reported U.S. landings of tuna and tuna-like fishes in 1986 were 25,157 MT. This represents an increase of 5,049 MT over 1985. The increase is a result of additions of recreational rod and reel catch, particularly for king and Spanish mackerels, to U.S. landings for the first time in 1986. Landings for king and Spanish mackerels combined accounted for 11,341 MT. Bluefin landings were down slightly to 1,142 MT. An increase in albacore landings (162 MT) is due to reporting of recreational rod and reel catches.

Skipjack and yellowfin tuna landings were 1,004 MT and 5,354 MT respectively, about 780 and 900 MT below their 1985 levels. This resulted from a decrease in U.S. purse seine activity in the Caribbean. An expanding U.S. longline fishery for yellowfin in the Gulf of Mexico took approximately 2,900 MT in 1986. Swordfish landings increased slightly to 4,884 MT, due to increased fishing activity in the Caribbean Sea. Many coastal U.S. swordfish longliners have converted, at least seasonally, to yellowfin fishing.

Major research activities on large pelagics in 1986 included updating and correcting historical landings files for swordfish, preparation of data and analytical reports for the 1987 ICCAT Swordfish Workshop, initiation of data base development for eventual marlin assessments, a continuation of port and tournament sampling for billfishes and other pelagics, first time estimation procedures for partial bluefin discards, and evaluation of analytical methodology used in assessing the status of bluefin stocks.

## 6.21 URUGUAY

In 1986, the longline fleet of Uruguay caught 1,120 MT of tunas, tuna-like species and sharks. This was 2,158 MT less than in 1985 and is due to a decrease in the number of vessels of the fleet. Six boats which target swordfish, bigeye and yellowfin exerted the major part of their effort in

Uruguayan territorial waters starting in May. In the first two months, only two vessels operated and targeted albacore in international waters at around 20°S latitude in the southwest Atlantic.

Research concentrated mainly on processing logbook data and on sampling of the landings and the results were submitted to ICCAT. Uruguay is also conducting it first on-board sampling on one of the vessels of the tuna fleet.

6.22 U.S.S.R.

In 1986, the total catch amounted to 9,693 MT, including 1,851 MT of yellowfin tuna, 1,071 MT of bigeye tuna, 1,688 MT of skipjack, 271 MT of Atlantic black skipjack, 3,465 MT of frigate and bullet tunas, 18 MT of swordfish, 2 MT of sailfish, 23 MT of marlin, 1,085 MT of bonito, and 219 MT of Spanish mackerel. Compared to 1985, the total catch decreased by 5,803 MT due to a decrease in fishing effort in the purse seine and trawl fisheries of yellowfin, frigate and bullet tunas and bonito. Scientific research centered on the study of the intensity of the fishery, the size and age composition of the catches, the analysis of the functional structure of the distribution area of yellowfin and skipjack, and on the influence of equatorial currents on the distribution of commercial tuna aggregations. Two scientific-research and two exploratory cruises were carried out; two observers worked onboard commercial vessels.

6.23 VENEZUELA

No report was submitted.

6.24 CHINA (TAIWAN) (Observer)

In 1986, a total of 39,492 MT were produced by 190 Taiwanese longliners, as compared to the 1985 yearly production of 37,728 MT. This shows about a 4.7 percent increase in total catches by weight and a 5.6 percent increase in the number of fishing vessels operating in the Atlantic. Among the species caught by longliners were: albacore, yellowfin, bigeye, bluefin, swordfish, and skipjack, etc. Albacore is still the dominant species in the catch and comprised about 90.9% of the total 1986 catch. Of the total albacore catch (35,888 MT), 21,082 MT corresponded to the South Atlantic and 14,806 MT to the North Atlantic.

The Institute of Oceanography of the National Taiwan University has been in charge of collecting and processing fishery data, which have been routinely reported to ICCAT.

Length measurements were taken of 130,686 individuals. Of these, 124,077 were albacore, 3,793 were yellowfin, 2,363 were bigeye and 453 were of other species.

In order to take into account the dynamics of albacore, fishing effort on the south stock was standardized and updated to 1986 using the Honma

method. In addition, the production model was applied in the analyses of the north and south stocks.

6.25 EUROPEAN ECONOMIC COMMUNITY (Observer)

The observer from the European Economic Community (EEC) noted that his organization, while awaiting the ratification of the Protocol to the ICCAT Convention, did not have to report at this time. Rather each of the members of the Community which is also a contracting party of ICCAT had presented an individual country report. Through the course of the past year the EEC has followed the work that has proceeded as regards recommendations made by ICCAT for research on tunas in the Atlantic and the Mediterranean and involving Community non-member countries.

A study was carried out on tunas in Greek waters as announced last year. The preliminary results of this study are interesting. The final report on this research project will be available after November 1, 1987 and ICCAT will be duly informed. This study, on swordfish, albacore and bluefin tuna, was financed by the the EEC and was carried out in collaboration with the Greek Ministry of Agriculture and the Italian Institute of Marine Biology of Nardo. The study involved a qualitative and quantitative description of the fleets, the fishing areas and gears for the three aforementioned species in Greek waters.

The study also presents an analysis of fishing effort and CPUE as well as information on the stocks and biological data (sex-ratio, maturity, size-weight).

The EEC is very interested in research on tunas and in this respect is offering to finance research on these species for its member states, especially those in the Mediterranean.

6.26 ITALY (Observer)

The importance of tuna and tuna-like fisheries to the Italian economy has increased and there has been an improvement in the collection of data. Special effort has been made in this aspect by the Italian Ministry of the Merchant Marine since 1984. In fact, new information on total catches, number of boats, gears, CPUE indices per gear, length classes, etc., and other information on the fishery is now available on bluefin, albacore and swordfish for 1984, 1985 and 1986. Other information is also available on the biology of the species, with special attention to the reproductive biology of swordfish.

These fisheries are important both to the economy and the labor market due to the high number of fishermen involved, both professional and non-professional, especially in the southern Italian region. The most important species seem to be swordfish, which have rapidly substituted bluefin tuna as the principal species in recent years. Swordfish catches increased in 1985 and seem to show the same trend for 1986, even though complete data are not yet available. On the other hand, the industrial purse seine catches of tuna show an alarming decrease, which seems to follow the decreas-

ing trend since 1980. Albacore catches are increasing for both the target longline, gillnet and hand line fisheries and as by-catch during swordfish fishing operations, mostly in the southern regions.

6.27 ST. HELENA (Observer)

The local inshore artisanal fishery for the large tuna species produced 72 MT in 1985 and 82 MT in 1986, mainly yellowfin. Fishing effort remained at around 2,800 line days. However, three experimental boats of a more seaworthy design were introduced in 1986 including a catamaran design. Skipjack seasons have been poor since 1985 (62 MT); 138 MT 1986; approximately 120 MT in 1987. Included in these totals for 1986 and 1987 are the quantities derived from purse seine trials - 60 MT in 1986 and 38 MT in 1987, predominantly skipjack but also including Auxis thazard. The majority of the skipjack has been salt-dried for export.

The offshore fisheries resource survey within the 200 mile EFZ has now been completed (Sept. 85-July 1987). Fisheries and marine biological/-oceanographic data and samples are now being analyzed. Experimental fishing and tagging of yellowfin on the two shallow seamounts have indicated a semi-resident stock which will form the basis for a future expansion of the fishery directed at the larger tuna species.

Item 7. REPORT OF THE SWORDFISH WORKSHOP

The SCRS Chairman noted that the Workshop had adjourned and had adopted its report just one day prior to the opening of the SCRS. In order for the report to reflect the quality of Workshop, it was presented in the three languages at a later time during the SCRS meeting. Therefore, only a brief review was made on the results of the Workshop at this time.

Mr. J. C. Rey, Convener, informed the Committee that the Workshop was held on October 6-13, 1987, at the Hotel Velázquez, Madrid. A total of 25 scientific papers were submitted to the Workshop, which comprised one third of the total number of papers presented to this SCRS session, and indicates the interest of the scientists in swordfish research. The Workshop participants worked very hard and successfully created a data base of catch at size and catch at age. They reviewed and agreed upon the conversions between weight and different measurements as well as on the time-area stratum in which the data should be compiled.

The stock assessment study was not completed due to the shortage of time but progress made by the Workshop was very satisfactory.

At a later session of the SCRS, the written Report of the Workshop was presented by its Convener. The Committee reviewed the report and congratulated the Workshop participants and the Convener for their achievements.

The Report was adopted. While adopting the Report of the Workshop, the Committee decided that instead of including it as an appendix to the SCRS Report it would be published, together with all the scientific papers presented to the Workshop, in a separate issue of the Collective Volume of Scientific Papers series.

## Item 8. REPORT OF THE WORKING GROUP ON JUVENILE MULTI-SPECIES STATISTICS

In the absence of the Convener of the Working Group, Mr. M. Mensah (Ghana), Dr. F. X. Bard presented the report of the Group (SCRS/87/8). The Working Group met on June 1 through 5, 1987 in Dakar, Senegal. A comparison of species catch composition of various tropical fleets and between different data sources comprised the major part of the work done by the Group.

The Working Group found that there was some misreporting of species between skipjack and other tunas, just as much as there was misreporting between yellowfin and bigeye. Several important recommendations were made by the Working Group concerning the misreporting of species and the sampling scheme for west Atlantic tropical tunas.

The Committee referred the Working Group's Repoprt to the tropical species groups and the Sub-Committee on Statistics for further review.

At a later session, the Committee reviewed the entire report together with the views expressed by the species groups and the Sub-Committee on Statistics. The Report was then formally adopted by the Committee and it was agreed that it will also be published in a volume of the Collective Volume of Scientific Papers together with the tropical tuna papers submitted to this SCRS Session.

## Item 9. REVIEW OF CONDITIONS OF STOCKS

### YFT-Y E L L O W F I N  T U N A

#### YFT-1. Description of fisheries

Yellowfin are caught throughout the entire tropical Atlantic, between about $20^{\circ}$ N and $20^{\circ}$ S by surface gears (purse seine and baitboat) and by longline. The surface fisheries operate in both the east and the west, sometimes extending quite far from shore. The traditional longline fisheries operate in all the mid-tropical area. However, new longline fisheries, near the coast, have recently appeared in Uruguay and the United States.

Catches

The catch figures for these gears, broken down for the east and west Atlantic, are presented in Table 1 and Figure 1 for 1973-1986. The following can be noted:

For the Atlantic as a whole, catches in 1984 decreased to their lowest level since 1974, then increased in 1985 to the 1981-83 level. The 1986 figure, slightly lower, is still preliminary.

In the east Atlantic, catches have increased from 1973 to a peak of 134,000 MT in both 1981 and 1982. Catches decreased significantly in 1984. They increased substantially in 1985 and 1986 to the 1975-80 level, essentially due to good catches by the purse seiners. In addition to this, the estimates of catches by the Tema-based baitboats for 1984-1986 were revised

upwards as a result of the work of the Working Group on the Juvenile Multi-species Statistics, which made an estimate for these years based on multi-species sampling. This corrected the confusion of species which exists in the commercial reports. It is difficult, however, to make an analogous correction to the figures from previous years.

Catches by longliners operating in the east Atlantic continue showing a steady decrease since 1972 and presently represent approximately six percent of the catch in that area.

In the west Atlantic, the surface fisheries have developed rapidly since 1982, increasing the total west Atlantic catch to a peak of 38,000 MT in 1985. These catches are essentially made by purse seiners and baitboats based in Venezuela. The longliners operating in the west Atlantic have maintained a catch level of roughly 7,000-11,000 MT over the past decade.

Fishing effort

Nominal fishing effort for the east Atlantic surface fleets is shown in Table 2 and Figure 2. A recent estimate of effective fishing effort is also shown in Figure 2. For 1984 to 1986 a very significant decrease in fishing effort can be observed in the east Atlantic, attributable to the departure of the purse seiners to the Indian Ocean.

In the west Atlantic, there is at present no reliable estimate of fishing effort.

Catch rates

The catch rates for the purse seine fleets in the east Atlantic have clearly increased in 1985 and 1986. This is also the case of the baitboats based in Dakar.

## YFT-2. State of the stocks

As in the past, there are alternative hypotheses for the yellowfin stock structure: either two stocks separated into east and west around 30°W, or a single Atlantic stock. The separate-stock hypothesis remains the most likely, despite the fact that two transatlantic migrations have been observed. It should be noted that the majority of the catches up to 1983 were made in the east Atlantic, and because of the lack of analyses on the new west Atlantic fisheries, most of the analyses and conclusions presented here concern the east stock.

### YFT-2.1 East Atlantic stock

The availability of data from the Spanish purse seine fleet made it possible to have a set of reliable statistics which permits new analyses. However, these analyses are still provisional until the results are obtained from detailed analyses which will be carried out during the Yellowfin Year Program.

A classic abundance index derived from French and Spanish purse seine statistics is shown in Figure 3. A recovery in this abundance index series is noted in 1985 and 1986.

A production model is presented in Figure 4. A decrease in fishing effort, noted for 1984 to 1986, brought about a change in the catches in accordance to the model, although the recovery of the catches in 1985 and 1986 was more rapid than estimated. Different attempts of adjustment were made by varying m (shape parameter) and k (number of age classes). All the estimates (excluding the less likely m = 0 case) vary around a maximum sustainable yield (MSY) of 117 to 127,000 MT for an optimum effort of 48 to 65,000 standard purse seine days. The current fishing effort is estimated at 37,800 days for 1985 and provisionally at 28,900 for 1986. The current effort level is, therefore, below the optimum level.

Cohort analyses provided estimates of the fishing mortality vectors to compare the period when the effort level was high (1980-1983) and the recent period of reduced effort (1984 to 1986) (Figure 5). The tuning of these cohort analyses is, however, rather rough and there are many sources of error that can affect them, such as: the extrapolation/substitution process of the samples to the catch-at-age table; the process of developing an age composition table using a single growth curve; the difficulty in obtaining a single solution to cohort analysis.

However, there seems to be a reduction in fishing mortality, especially on large fish, which is attributable to the purse seiners. This would be in accordance with the recovery observed in abundance. However, because of the uncertainties brought about by the tuning of the cohort analyses, this reduction in fishing mortality could also be due to the arrival in the fishery of two strong age-classes (1981-1982), which explained the recovery being more rapid than estimated.

The use of these fishing mortality vectors in a yield-per-recruit model allows drawing the yield isopleths for the two periods in consideration (Figure 6), 1980-83 and 1984-86.

It is noted that there would be less benefit to be attained from an increase in age at first capture if the current reduced level of fishing effort continues. This is different from the 1980-1983 period of high exploitation.

YFT-2.2 West Atlantic stock

As in the past, due to the lack of adequate statistical data for the surface fishery, there is no reliable abundance index, and it is not possible to draw conclusions on the state of the west Atlantic stock. The rapid increase in catches from 1983 to 1985 has already been interpreted as a favorable index of yellowfin productivity in the area. This is all that can be said at present.

YFT-2.3 Total Atlantic stock

No new analyses have been made available; thus, the conclusions in the 1983 SCRS Report are maintained. However, because the CPUE used comes

mainly from the east Atlantic fisheries, the analysis can be biased if the CPUE in the east Atlantic does not represent total Atlantic abundance. Consequently, no conclusions are available for the hypotheses of a possible single Atlantic stock to the recent variations in effort in 1984-1986.

## 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 1978, 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 fisheries, as has been stated in previous SCRS Reports, and is ineffective in reducing the mortality of juvenile yellowfin. A large number of juvenile yellowfin continue to be caught. Cohort analyses (Figure 5) show that fishing mortality of juvenile yellowfin remains high.

## YFT-4. Recommendations

### YFT-4.a Statistics

Regarding the statistical problem of the Tema-based baitboats, important progress has been made by the Working Group on Juvenile Multi-species Statistics. However, corrections have only been possible for the years 1984-1985. It is recommended, therefore, to continue these studies for a correction method as the statistics for the following years become available.

The statistics problems linked to the Venezuelan surface fishery have not yet been resolved. It is strongly recommended to remedy the situation by two actions:

--Publish, as soon as possible, a sampling manual which includes clear explanations of sampling methods.

--Apply the multi-species sampling methods already in effect in the African ports.

### YFT-4.b Research

It is necessary to improve and increase the analyses on the state of the yellowfin stocks and especially of the mechanisms that explain the recovery observed for this stock. Therefore, the following actions are recommended:

i) The estimation procedure for catch at length from purse seiners should be improved.

ii) The estimation procedure for catch at age from the catch-at-length tables should be improved.

iii) Analyses on the state of the stock, especially those for catch at age, should be carried out according to different population analysis methods recently updated for other species.

The practical application of these recommendations is proposed within the framework of the Yellowfin Year Program.

YFT-4.c Management

Effective fishing effort carried out on yellowfin in the eastern Atlantic from 1981 to 1983 had probably surpassed the optimum level of effort which corresponds to the theoretical MSY.

The great drop in yield resulting from this high effort has provoked the departure of a very large number of purse seiners of France, Côte d'Ivoire and Spain towards the Indian Ocean. This reduced nominal effort has been maintained from 1984 to 1986 and has resulted in significant improvement of the catches by most boats in 1985 and 1986. This is probably due to the rapid recovery of the stock according to the theoretical model. The available abundance index is in agreement with this interpretation.

Furthermore, the fishing mortality imposed on juvenile yellowfin by the purse seiners and baitboats remains substantial.

Finally, it should be recalled that purse seiners operating in the Indian Ocean remain in that area because of good catches, but they could easily return to the east Atlantic.

For all these reasons, the Committee reiterates its assertion that the scientific base on which the present recommendation for management measures is established was justified. With the intensive exploitation of 1982-1983, the effective application of the regulation could have brought about appreciable gains in yield-per-recruit. Nevertheless, the gains would be minor if the current situation (1984-1986) of reduced effort under the same exploitation scheme is maintained.

## BET-B I G E Y E  T U N A

### BET-1. Description of fisheries

Bigeye tuna are one of the most pelagic species inhabiting the very wide area of the Atlantic Ocean between 40° N and 40° S. The spawning grounds are located in the tropical area between about 10° N and 10° S, and occurrence of juveniles is concentrated only in the eastern equatorial Atlantic. It is considered that Atlantic bigeye tuna constitute a single stock.

In recent years, Japanese and Korean longline fisheries have been targeting bigeye tuna and operating in almost all areas where large bigeye tuna are abundant. In the local longline fisheries, bigeye tuna have also

been an important species in Uruguay and are becoming a target species in the U.S.A. There have been local baitboat fisheries targeting bigeye tuna seasonally in the areas around the Azores, Madeira, the Canary Islands and off Dakar. Tema-based baitboats take juvenile bigeye tuna mixed with yellowfin tuna and skipjack in the Gulf of Guinea. The tropical purse seine fleet, which also targets yellowfin tuna and skipjack, catches bigeye tuna as a by-product.

The annual catches of bigeye tuna for the years 1972-86 are shown in Table 3 and Figure 7. The catch was recorded as high as 63,600 MT in 1974 and then it showed a decreasing trend until 1979 (45,100 MT). In 1980, catches increased to 63,000 MT, and since then they have remained at a high level, ranging between 58,600 (1983) and 74,500 MT (1985). The preliminary 1986 catch amounted to 63,100 MT, a 15 percent decrease as compared to previous years. This is attributed to the decrease in the longline catch, which has continuously made up more than 60 percent of the total catch.

The highest longline catch was recorded in 1982 (51,800 MT), but decreased to 34,200 MT in 1986. The fairly large decrease in 1986 (30 percent) was due to the shift of some longliners to other oceans. The bigeye baitboat fisheries experienced their highest catch (17,600 MT) in 1985, which was followed by a slight decrease to 16,100 MT the next year. Among these fisheries, the revised catch of the Ghana-based fleet, which takes juvenile bigeye tuna, increased its catch to 1,500 MT in 1986. From 1981, the tropical purse seine fleet has been harvesting bigeye tuna, including a fair amount of juvenile bigeye, at a level of 14,000-16,000 MT. In 1985, the catch decreased considerably to 7,900 MT, but increased to 11,500 MT in 1986. The decrease in 1985 was due to the transfer of some purse seiners to the Indian Ocean.

## BET-2. State of the stocks

The thorough review of the stock structure carried out at the Bigeye Day Session held during the 1986 SCRS, supported the single-stock hypothesis. The present evaluation of the status of the Atlantic bigeye stock was based on this hypothesis.

The updated trend of the relative abundance of the adult stock, as reflected by longline CPUE, indicated that its level in recent years has been on a slight upward trend, and at about two-thirds of initial exploitation (Figure 8). This increasing trend may not necessarily reflect that of real abundance due to insufficient adjustment in gear efficiency between regular and deep longline operations.

The results of an updated production model analysis indicated recent exploitation of the Atlantic bigeye stock has been at a high level, but the present fishery is operating below the MSY level (Figure 9). New estimates of MSY ranged between 73,600 MT ($m = 2$) and 174,800 MT ($m = 0$), depending on the parameter ($m$) of the model used. Compared to previous results, the general form of the yield curves of the present analysis remained unchanged, although slightly higher values of MSY were obtained.

Since the bigeye fishery has been unchanged in recent years, the previous results on yield-per-recruit (Y/R) analyses might be more or less relevant. According to the results from a standard Y/R analysis, under the present conditions of the bigeye fishery, no gain in Y/R could be achieved by an increase in the size at first capture and a gain could only be obtained by an increase in fishing mortality (Figure 10). It is also noted multi-gear type Y/R analysis (Figure 11) that maximum Y/R could be attained by increasing the fishing mortality of the large-fish fishery coupled with reducing that of the small-fish fishery. It should be stressed that because the presently available evaluation on the stock status of bigeye tuna is still preliminary, further research should be undertaken, taking into account new estimates of catch data on tropical surface fleets revised at the present SCRS.

## BET-3. Effects of current regulations

The bigeye minimum size regulation of 3.2 kg has been in effect since 1980, simultaneously with the same size regulation for yellowfin tuna. It has been reported in recent years that landings of a fairly large number of juvenile bigeye tuna have been continuing by the tropical surface fleets. However, a species complex problem involved in the reported catches of the tropical surface fleets has made it difficult to accurately estimate the effects of the regulation.

## BET-4. Recommendations

### BET-4.a Statistics

i) Ongoing multi-species sampling of the surface catch in the eastern tropical Atlantic should be continued to resolve the species complex problem in the reported catch which mixes juvenile bigeye and yellowfin tunas and skipjack. The same sampling scheme is also necessary in the west Atlantic.

ii) Species and size sampling of catches transshipped to Puerto Rico should be continued. Sampling on east and west Atlantic catches at Puerto Rico is useful to complement sampling in African ports, by which the extent of bias due to size sorting of catches for different markets can be investigated.

iii) Calibration of gear efficiency between regular and deep longline operations should be continued to obtain a common measure of effective effort.

### BET-4.b Research

i) An index of abundance that incorporates information from the bigeye surface tuna fisheries should be developed.

ii) Age-structured stock analysis, such as cohort and yield-per-recruit analyses, should be updated using recently improved catch data. An

analysis on evaluation of the effect of taking small bigeye tuna must be emphasized.

BET-4.c Management

At present, the Committee has no new findings to change the management recommendation given to the Commission in 1984.

## SKJ-S K I P J A C K  T U N A

### SKJ-1. Description of fisheries

Skipjack tuna are caught almost exlcusively by surface gears (purse seine and baitboat) in the east and west Atlantic.

After a declining trend since 1983, skipjack catches in the east Atlantic in 1986 reached 88,000 MT, which is similar to the 1984 catch level. This is mostly due to an increase in purse seine catches which in 1986 were 20 percent higher than the 1985 catches (47,600 MT) (Table 4, Figure 12). Skipjack catches by the baitboat fleet also increased, but this increase was less marked.

With regard to the west Atlantic, catches have not maintained the high level reached in 1985. Catches in 1986 were 34,300 MT, which are very similar to those of 1984 (Table 4, Figure 12). However, this decrease is less significant than the increase in the east Atlantic. The skipjack catch for the total Atlantic has increased and is similar to the 1984 level.

In analyzing the relationship between skipjack catches of the purse seine fleet and the carrying capacity of this fleet (Figure 13), a sharp decrease (33 percent) can be observed in vessel carrying capacity in the last three years (1984-1986), with respect to the previous three years (1981-1983). This is only partially reflected in the catches, which decreased but in a lesser quantity (17 percent). The same analysis carried out on yellowfin catches shows, on the contrary, a percentage of decrease in the catches which corresponds to carrying capacity.

For the same period, the activities of the baitboat fleet are uncertain, although there was a nine percent reduction (Figure 13) in carrying capacity. The response of the catches to this reduction is difficult to interpret since catches from 1984 on have been adjusted based on port sampling in Abidjan, and according to the Working Group on Juvenile Multispecies Statistics (Dakar, 1987), skipjack catches from previous years could be overestimated.

Effort in the east Atlantic, measured in vessel carrying capacity, has remained stable for baitboats, while purse seine effort has continued a declining trend which started in 1983 (Table 2).

There are no data available on fishing effort exerted on the west Alantic skipjack stock.

## SKJ-2. State of the stocks

The results of the last evaluation of the skipjack stock in the east Atlantic, carried out in 1984, showed a situation of under-exploitation. Since then, it does not seem that there have been any significant changes.

The decline in carrying capacity of the purse seine and baitboat fleets, (29 percent in the last three years with respect to 1981-1983), shows a clear reduction in nominal fishing effort, and it is very probable that effective effort has followed a similar trend. If this is so, the exploitation level would have been reduced and the conclusions on the state of the skipjack stock, which have been accepted up to now by the Committee, are reinforced.

There have been no modifications in the exploitation scheme in the last three years.

Regarding parameters such as CPUE, it is not advisable to interpret the trends as an indicator of the state of the skipjack stock. The clear increasing trend (Table 5, Figure 14), which can be observed in the CPUE of the purse seine fleets, should not be interpreted as an indicator of abundance trends of the stock, but rather as a change in the activities of the fleet because of the low yellowfin abundance from 1979 to 1984 (Figure 14) and/or to variations in the catchability of skipjack. The availablity of skipjack to purse seines could have increased as competition between boats decreased as a consecuence of the reduction in the number of vessels in the fleet.

As has been the case in other years, data available on the skipjack stock in the west Atlantic are insufficient to carry out an analysis of the stock.

## SKJ-3. Effects of current regulations

There are currently no management measures in effect on skipjack. The conclusions reached by the Working Group on Juvenile Tropical Tunas (Brest, France, 1984) still hold in that the current regulations in effect on yellowfin and bigeye do not affect skipjack.

## SKJ-4. Recommendations

### SKJ-4.a Statistics

i) Continue the collection of catch and effort data on the purse seine and baitboat fleets which operate in the west Atlantic. The introduction of a logbook system for the Venezuelan surface fleets is an important achievement and it is recommended that this work continue for further improvement.

ii) Emphasize the recommendations of the Working Group on Juvenile Multi-species Statistics (Dakar, Senegal, 1987) concerning the strategy to be followed in Venezuela for biological sampling of the surface catches.

iii) Study possible biases in port sampling based on information obtained from observers.

iv) Recommend that the Secretariat revise and improve the current tables on carrying capacity of baitboats in the east Atlantic and purse seiners and baitboats in the west Atlantic.

SKJ-4.b Research

i) Conduct complementary reseach on maturity, fecundity, and spawning of the skipjack stock in the west Atlantic.

ii) Pursue studies on the spatial/temporal interactions between fleets and concentrations of skipjack.

iii) Continue studying the effects of environmental factors on skipjack abundance, availability and recruitment.

iv) The evaluations of the skipjack stock which have been carried out based on frequently used models have presented serious problems since these models are difficult to apply. Therefore, it is recommended that a study be made of alternative methods to evaluate the skipjack stock in the east Atlantic .

SKJ-4.c Management

There are no apparent reasons to modify earlier conclusions reached by the SCRS. In accordance with the results obtained by the Working Group on Juvenile Tropical Tunas (Brest, 1984), management measures on Atlantic skipjack are neither necessary nor advisable. As in the past, the Committee observed that skipjack tuna are under-exploited.

## ALB-A L B A C O R E

### ALB-1. Description of fisheries

Albacore in the Atlantic is considered to be comprised of two stocks separated, by convention, at 5°N. However, the possibility of the existence of a Mediterranean stock and that the South Atlantic stock may be related to the Indian Ocean stock should not be discarded.

Table 6 presents a historical catch series by gear and by country for 1972-1986. In 1986, albacore catches in the North Atlantic were estimated at 39,000 MT.

In the North Atlantic, the surface fisheries caught mainly young individuals (1 to 5 years) and the longline fishery caught mainly adult individuals (5+ years) which are potential spawners.

Surface catches in the South Atlantic in 1986 were estimated at 23,800 MT (12,500 MT by baitboat and 11,100 MT by troll). In the same year longline catches were 15,200 MT.

New gears, such as drift nets and pelagic trawls (in pairs) started fishing for albacore in 1987 in the French fishery.

There is also an important fishery for albacore in the Mediterranean. There are some difficulties in knowing the real catch levels, although these could be close to 5,500 MT.

The preliminary results of a study financed by the EEC in 1987 on tuna fishing in Greece indicate that albacore fishing developed in this area after 1980. This fishery catches mostly 2-3 year-old fish by longline and troll.

The total South Atlantic catch in 1986 was 27,900 MT. Of these, 23,000 MT were caught by longline and 4,900 MT were taken by surface gears.

## ALB-2. State of the stocks

### ALB-2.1 North Stock

Catch and effort by the troll fishery have continually decreased from 1957 to 1985 (Figure 15). Catch and effort of the baitboat fleet remained more stable than that of the troll fishery and showed a slight decrease for the same period (Figure 15).

Longline catches fluctuate widely throughout the historical series (Figure 15).

Catch per unit of effort (in weight) for the surface gears (troll and baitboat) can be considered as an index of abundance of young individuals. CPUE showed a relatively constant trend, with considerable fluctuation, from 1957 until the early 1970's. After that, CPUE of the surface gears has increased, although that of the baitboat fishery showed wide variations (Figure 15).

Longline CPUE is considered as an index of abundance of the adult stock. The effort used to calculate CPUE was estimated based on the standardization of all Taiwanese longline gears. Longline CPUE showed wide variations throughout the historical series, at about 0.25 MT per 1000 hooks (Figure 15).

The CPUE of age-3 cohorts, caught by trollers and baitboats, has been considered as an adequate index to estimate recruitment to the fishery. In studies carried out in previous years wide variations were observed in this CPUE from 1954 to 1981, with a decreasing trend and increased variability since 1969. The 1979 to 1981 cohorts were already showing recruitment 50

percent below the average recruitment for the 1950's and 1960's. However, this data series has not been updated, thus it is not possible to estimate the recent levels of recruitment.

New production model analyses were carried out. Effort data from all fisheries combined were standardized, using the Taiwanese longline fishery as a base. The MSY values obtained were between 48,200 and 51,500 MT, equivalent to effort values of 169.1 and 180.6 million hooks for k=1 and m = 1 or 2, respectively (Figure 16).

These ranges of MSY differ considerably from those obtained in analyses carried out in previous years (Biennial Report, 1984-85, Part II), which resulted in values of MSY between 59,800 and 70,400 MT. In these analyses, effort has been standardized to the baitboat fishery, whereas in the current analysis effort was standardized to the Taiwanese longline fishery. The differences between these evaluations are less marked when compared to results obtained with m = 2. However, the catch data base for 1969 to 1974, used to fit the production model, differs between +7 percent (1973) and -18 percent (1972) with relation to the data base updated by ICCAT.

In addition, the production model does not seem to be the most adequate model for evaluating this population.

ALB-2.2 South stock

Catch and effort for the south stock showed wide variations throughout the historical series. Catch as well as effort showed similar trends (Figure 17). CPUE of the longline fishery which operates in the South Atlantic can be used as an index of abundance for the adult stock (Figure 18). This figure shows longline CPUE from 1967 to 1986. Since the early 1970's, CPUE has remained relatively constant.

There are no abundance indices for the juvenile stock. In recent years an increase in catches of juvenile albacore was noted in the surface fisheries; however, in 1986 these catches decreased 12.5 percent.

The production model was fit to the standardized catch and effort data for 1967 to 1985. Two effort measurements were analyzed: Case 1) using fishing intensity expressed in number of effective hooks, and Case 2) using fishing intensity in number of hooks by $5^{\circ}$ x $5^{\circ}$ squares. Both cases gave similar estimates of MSY. Therefore, only Case 2 was considered to compare these results with those obtained in 1985 (Figure 19).

The MSY obtained by production model (Case 2) ranged between 23,800 to 24,800 MT, corresponding to an effort of $138.3 \times 10^4$ hooks and $169.4 \times 10^4$ hooks per $5^{\circ}$ x $5^{\circ}$ square for k = 4 and 3, and m = 1 and 2, respectively.

Catches in 1985 (28,200 MT) and 1986 (27,900 MT) were slightly higher than the MSY values obtained by production model and effort intensity applied in 1985 ($163 \times 10^4$ hooks/$5^{\circ}$ x $5^{\circ}$ square) is within the range corresponding to MSY.

Therefore, the Committee suggests that the stock is being exploited at a level close to the MSY of the longline fishery. However, the possibility of an interaction between the South Atlantic and Indian Ocean stocks should not be discarded.

## ALB-3. Effects of current regulations

There are no regulations currently in effect for albacore in the Atlantic.

## ALB-4. Recommendations

### ALB-4.a Statistics

i) Basic data should be collected from countries that fish in the Mediterranean and which presently do not submit data to ICCAT on a regular basis.

ii) Countries which fish in the North Atlantic with surface gears should continue to submit information on these fisheries in order to assure the continuity of the historical data series.

iii) Data coverage should be increased and effort data from the South Atlantic surface fisheries should be analyzed.

iv) Size data from ICCAT port sampling and Taiwanese national sampling should be compared to check for duplication of effort.

### ALB-4.b Research

i) VPA analysis, analytical production models, and estimates of recruitment should be carried out (or continued) for the North and South stocks.

ii) Catch, effort and size data should be compiled for the different fleets by adequate strata, if possible by $5^{\circ}$ x $5^{\circ}$ square and month (or less) in order to study effort standardization between gears.

iii) Research should be carried out on the relationship between albacore in the Atlantic and the Mediterranean to determine if they are two separate stocks.

iv) CPUE of the Taiwanese longline fleet in the Atlantic and Indian Oceans should be analyzed together. This study would contribute to clarifying the stock structure of the South Atlantic and Indian Oceans.

v) Tagging programs should be started (or continued) in the North Atlantic (and Mediterranean) as well as in the South Atlantic.

vi) Studies should be initiated (or continued) on the growth of albacore in the North Atlantic (and Mediterranean) and South Atlantic.

ALB-4.c Management

At present, the Committee does not make any recommendations for the management of the North stock, but increased research effort on this stock is advised.

The South Atlantic stock appears to be exploited slightly above MSY with the current exploitation scheme. Hence, the Committee recommends careful monitoring of the development of this fishery.

## BFT-B L U E F I N  T U N A

### BFT-1 Description of fisheries

There are fisheries for bluefin tuna in the east and west Atlantic Ocean and in the Mediterranean Sea. Many different gears are used and the size of fish caught varies depending on the gear. For many years, Atlantic bluefin tuna have been managed under a two-stock hypothesis, one stock occurring in the west and the other in the east Atlantic and Mediterranean Sea (Figure 20).

Table 7 and Figure 21 shows the catches in weight for the entire Atlantic separated into east Atlantic, west Atlantic and Mediterranean. The total catch estimated for 1986 (20,000 MT) is 20 percent below that of 1985. Provisional estimates of 1986 catches by areas are: 1,900 MT in the west Atlantic, 4,300 MT in the east Atlantic, and 13,800 MT in the Mediterranean.

BFT-1.a East Atlantic

In the east Atlantic, trap catches increased from 1976 (500 MT) to 1982 (2,300 MT), remained stable until 1984 (2,300 MT), and dropped to 800 MT in 1986. Longline catches were relatively stable between 1978 and 1981 (500 to 900 MT), increased in 1982 and 1983 to about 2,700 MT, then decreased to the 1978-1981 level in 1985 (540 MT) and 1986 (780 MT). Baitboat landings in recent years are almost exclusively made by Spain. During the last ten years, baitboat catches fluctuated between 1,000 and 4,000 MT, the maximum being in 1978 and the minimum in 1982. Recent data show similar catches in 1983 and 1984 (3,000 MT), and slightly lower catches of 2,300 MT for 1985 and 1986. Purse seine catches in the east Atlantic are low and exceeded 1,000 MT only in 1977. A second peak of about 700 MT was observed in 1982. The lowest annual purse seine harvest occurred in 1985 (90 MT), while 1986 catches increased to 280 MT. Spanish hand line and French trollers make up almost all the series of unclassified gears for recent years, and these gears landed just over 100 MT in 1986.

BFT-1.b Mediterranean

In the Mediterranean, the collection of statistical data is difficult due to the large number of countries that fish for bluefin with many dif-

ferent gears. The total catch in 1986 was estimated to be 13,800 MT, 75 percent of the 1985 level, which was the highest observed. Purse seine catches represent more than 55 percent of the total reported landings in 1986; this percentage has remained relatively constant for the last three years. Yield in 1986 (7,800 MT) is 30 percent lower than the 1985 harvest. Estimated catches for other gears increased continuously from 1979 to 1985 when they reached 5,800 MT. Estimates are poor for 1986, since much of the data have been estimated from the corresponding catches of 1985. Longline catches have been relatively high up to 1970 (1,200 MT to 2,400 MT), 80-90 percent lower in 1978-81, then up once again in 1982 and 1985 (940 MT to 1,500 MT). The catch level decreased to 500 MT in 1986.

Trap catches show a decrease for the last three years, going from 1,000 MT in 1984 to 570 MT in 1986. There have been no significant changes in the number of vessels targeting bluefin tuna in 1985 and 1986 except for a decrease in the number of Spanish baitboats and trollers based on the Atlantic coast but fishing in the Mediterranean. The number of boats decreased from 114 in 1985 to 2 in 1986.

BFT-1.c West Atlantic

West Atlantic catches were restricted by quotas to 1,160 MT in 1982 and 2,660 MT between 1983-1986; 2,660 MT was about 40 percent of the largest catch in 1973-1981. Longline catches increased by 50 percent from 1983 (800 MT) to 1985 (1,220 MT) and have returned to approximately the 1983 and 1984 levels in 1986 (739 MT). Catches by purse seiners remained stable, while rod and reel catches have declined by 30 percent from 1985. Catches by other gears (400 MT) decreased to about 40 percent of the 1983 level.

There was a decrease in effort expended by Japanese longliners in the west Atlantic in 1986 from 1985 effort levels. Current (1986) effort is similar to that of 1983 and 1984. The U.S. longline fishery for yellowfin in the Gulf of Mexico doubled its yellowfin catch in 1986 (over that of 1985). The by-catches of bluefin from that fishery apparently have also increased.

BFT-2. State of the stock

The Committee conducted its investigations using the two-stock hypothesis (west Atlantic and east Atlantic/Mediterranean). The growth and natural mortality rate parameters for each stock were the same as those used by the 1986 SCRS.

A new west-east transatlantic migration of a fish tagged in the west Atlantic (Mid-Atlantic Bight) and recovered southwest of Spain by a Japanese longliner was reported.

An east-west transatlantic migration of a juvenile tagged in the Bay of Biscay and recovered as an adult in the northwest Atlantic was also reported. Seven fish of 180 recoveries recorded in the ICCAT data base have made similar migrations.

Other information presented to SCRS this year, from natural tags on large fish, indicates an exchange between the Atlantic and the Mediterranean. These data reinforce the hypothesis put forth in several previous SCRS papers that part of the spawning stock remains in the Mediterranean throughout the winter.

Three SCRS papers examined the method (CAL) used by the SCRS to calibrate (tune) virtual population analyses using indices of abundance and concluded that with perfect data, CAL is reliable. Two papers examined the sensitivity of CAL using fishing mortality rates similar to bluefin fishing mortality rates (F's) estimated in recent assessments. A third paper examined the sensitivity at much lower F's. The first two concluded that even with noisy data, CAL estimated F reliably. The third paper concluded that CAL was not reliable when the fishing mortality rate was much lower than the natural mortality rate.

BFT-2.a East Atlantic

New CPUE series for small and large fish taken by French and Italian purse seiners in the Mediterranean were analyzed and compared with those previously available. The series on Spanish Atlantic trap and baitboat fisheries was reviewed and updated. Finally the series on Japanese Atlantic longline was considered (Figure 22). There is evidence of good recruitment in 1982 and perhaps in 1975. Good catch rates are noted for large fish in 1982 by Japanese longline and Spanish Atlantic traps. These rates did not appear to be from the 1975 recruitment. A decrease in the CPUE on large fish as well as on small fish in all the series in recent years is indicated.

The data on catch-at-age (Table 9) have clearly improved since 1975 but data for 1986 are still incomplete. If complete catches were to become available, the number of age 0 fish may provide a recruitment index. The catches of ages 1 to 3 increased sharply since 1982 and the catch trend from the 1982 cohort shows that the effect is reflected through 1985. These figures corroborate the conclusions of the CPUE analyses, noting the importance of the 1982 recruitment.

BFT-2.b West Atlantic

The Committee examined seven indices of abundance and analyzed the pattern of partial recruitment between 1984-1986 (the 2,660 MT quota was imposed in 1983). The method of tuning VPAs (used by the SCRS in 1986) involved using indices of abundance for different ranges of ages. This year, updated information was provided for the Gulf of Mexico larval index (1986) and the index from the Canadian handline fishery (1986). The indices derived last year for 3-5, 6-7, and 8-9 year-old bluefin tuna from records of U.S. observers on Japanese longline vessels were extended to 1986. Two CPUE series were developed by the SCRS using the general linear model (GLM) procedure. The first used Japanese longline catch and effort, 1974-1986, from the northwest Atlantic (north of 35°N). Available size frequency samples indicate that recent catches for this area are predominantly 3 to 6 year old fish. As far as possible, criteria used for developing similar

indices in earlier analyses (from Japanese longline data) were used. The second index was based on the U.S. rod and reel and handline fishery for large fish along the New England coast. It covered the years 1983 to 1986 and ages 10 to 30.

The Committee selected the partial recruitment pattern (PR) using separable VPA (SVPA). The inputs for this calculation were catch-at-age data from 1984 to 1986, reference age of 6 with an F = 0.2, M = 0.1, and the selectivity of the oldest age (15) set at 75 percent of the selectivity of the reference age. The final PR was similar in shape to that used by the 1986 SCRS (i.e., dome-shaped) except that the age of full recruitment was 6 in 1987 (7 in 1986) and younger fish (i.e., ages < 6) approached the fully recruited level more rapidly.

Three of the seven indices were used in tuning the VPA. Selection required the fully recruited F to be within the range 0.01 to 0.99, the probability of a positive correlation to be greater than 0.65, and for there to be no trend in the residuals. Indices that met these criteria were the Japanese longline index (ages 3 to 6), the Gulf of Mexico larval index (ages 10 to 30) and the U.S. rod and reel and handline index (ages 10 to 30) (Figure 23).

The Committee discussed the reliability of the estimates of PR and the indices of abundance. Two of the three indices were generated during the SCRS meeting and were considered to be preliminary in nature. The PR estimate, while similar in shape to the curve estimated by the 1986 SCRS, was more highly variable (i.e., larger C.V.) than the 1986 estimate. However, while highly variable, the Committee could not identify any biases in the PR estimates or indices and considered them to be adequate for VPA tuning.

The Committee felt that multiple indices of abundance for the same age group could bias the terminal F estimated by the VPA tuning procedure, if all indices were weighted equally. To avoid this potential problem, the sums of squares from the two large fish indices (ages 10-30) were weighted in a manner that gave the combination of the two indices the same weight as the single, age 3-6 index.

Results of the tuned VPA applied to the catch-at-age table (Table 10) updated in 1981 indicate that 1987 adult stock size (ages 10-30) is approximately 30 percent of the 1970 level; ages 6-9 approximately 20 percent; and ages 1-5 approximately 15 percent of the 1970 level (Figure 24 and Table 11).

The results of this year's VPA are similar to those generated by the Working Group on Bluefin Tuna in 1985 and the SCRS in 1986 (Figures 25 and 26). VPA results from the 1984 Bluefin Working Group, however, do differ.

Similar VPA tuning procedures were used in 1985, 1986 and the most recent assessments (1987). However, due to the absence of any stable CPUE series for the smaller fish in the 1984 assessment, the Working Group utilized information from tagging studies. At that meeting, the Group expressed reservations that "the method was likely to give estimates that were biased upward." However, the Committee believes that the recruitment trend estimated by the 1984 Bluefin Working Group was not biased. The

general trends for Age 1 (Figure 25) and adult sizes, age 10 to 30 (Figure 26), are similar to recent assessments.

Some members of the Committee were concerned that the stock size estimates of young fish may have been underestimated. This would have occurred if the PR had been overestimated for young fish. In particular the 1982 year-class, which had been a strong year-class in last year's VPA, is not especially strong in this year's analysis. The Committee felt that there were two possible explanations: (1) that the 1982 year-class had indeed been strong but due to environmental (or other) factors, its availability to the fishery in 1986 had been low; or (2) that the year class had been only average in strength and the large catches taken from it in 1982, 1983, and 1984 reduced it to a relatively low level. This year's VPA supports the latter explanation but the Committee noted that it would take at least one or two more years of data before a more definitive conclusion can be reached.

The Committee concluded that despite the uncertainty in the VPA results (particularly in the indices and the PR), they provide a useful basis for management advice.

## BFT-3. Effects of currents regulations

The ICCAT recommendation to limit fishing mortality on bluefin for the entire Atlantic Ocean and the Mediterranean Sea went into effect in August, 1975. If this is interpreted as limiting catches, the effectiveness of the recommendation can be investigated by examining catches since that time. Estimated total Atlantic and Mediterranean catches declined from 26,100 MT in 1975 to 18,400 MT in 1979, averaged about 25,500 MT in 1982-1985 and decreased to 20,000 MT in 1986. In the west Atlantic, catches averaged approximately 6,100 MT from 1976 to 1981. The effects of additional regulations applied in the west Atlantic after 1981 are discussed below.

Catches in the east Atlantic declined from 10,000 MT in 1975 to 5,200 MT in 1976, increased to 7,000 MT in 1977, declined regularly to 3,300 MT in 1981 and increased again in the following three years to approximately 7,000 MT. In the Mediterranean, catches increased from 11,000 MT in 1975 to 17,300 MT in 1976, declined to 7,300 MT in 1979, increased thereafter to 15,100 MT in 1982, decreased in 1983 to 12,900 MT and increased to 18,500 MT in 1985 and have remained stable in 1986.

A regulation prohibiting the catching and landing of bluefin tuna less than 6.4 kg for the entire Atlantic stock went into effect in August, 1975; an exemption allowed incidental catches of 15 percent (by number). After the regulation came into effect, the percentage of individuals less than 6.4 kg was low in the west Atlantic from 1976 to 1981 (1.7 to 7.6 percent), but it increased to 22.4 and 17.8 percent in 1982 and 1983 (Table 8). The percentage declined to 4.1 percent in 1984, 1.6 percent in 1985 and 3.1 percent in 1986. In contrast, the percentage of undersized fish is still high in the east Atlantic and Mediterranean Sea with a 1976-1985 average of 50 percent and 30 percent, respectively.

An additional regulation limited west Atlantic catches in 1982 to 1,160 MT and 2,660 MT each year during 1983-1986, and prohibited fishing directed at the spawning stock in the Gulf of Mexico. As a result catches declined (Table 7).

A third regulation for the west Atlantic limited catches of bluefin tuna less than 120 cm straight fork length (SFL) to no more than 15 percent (by weight) after 1983. The percentage (in weight) of bluefin less than 120 cm SFL steadily decreased from 1975-1983, and since 1979 less than 15 percent of the total west Atlantic catch has been below that size (Table 8).

## BFT-4. Recommendations

### BFT-4.a Statistics

i) That, as recommended the last three years, the ICCAT Secretariat implement a sampling program for Mediterranean fisheries to acquire catch estimates and length frequency samples (Turkey, Yugoslavia, etc.) and to obtain catch statistics and biological samples for all developing fisheries such as the one in Greece.

ii) That all countries submit catch estimates, size samples, and catch-at-length estimates two months prior to any SCRS meetings so that analyses involving updated catch-at-age data will be possible at the meetings.

### BFT-4.b Research

i) That research on the stock structure in the east Atlantic and Mediterranean Sea be continued. Emphasis should be on 1) spawning areas and 2) tagging to investigate interchange of fish between the east Atlantic and Mediterranean Sea and movement within the Mediterranean Sea.

ii) That countries estimate numbers of bluefin tuna discarded (excluding those fish released alive) and provide these estimates along with appropriate size data to incorporate in the catch at age used in cohort analysis.

iii) That validation work be carried out on age estimation from hard parts of bluefin tuna. This may require some form of workshop for hands on laboratory work as well as data analysis.

iv) As presently available indices of abundance provide limited information, it is essential to develop improved indices.

a) Statistical estimation methods, such as GLM (General Linear Model), should be used whenever possible in developing indices.

b) The age group to which indices apply should be described as precisely as possible.

c) Indices calculated at the 1987 meeting should be examined in detail for possible refinement and submitted in 1988. Use of environmental variables to refine these indices should be examined.

d) That research effort be directed towards obtaining new indices for all size groups, particularly for young fish (0-3 years of age) and mature fish (10+ years). Experimental approaches as well as further examination of available data should be considered.

v) That appropriateness of methods of tuning cohort analyses for bluefin tuna studies should be examined further, including the effects of weighting different CPUEs, different rates of exploitation and variable recruitment to age groups used in CPUEs. Alternative methods for conducting catch-at-age analysis, such as CAGEAN, should also be investigated.

vi) That as a longer-term goal, methods for estimating the variance of VPA stock size estimates be developed.

vii) That the ICCAT Secretariat review problems of availability of access to computer facilities when working groups conduct assessments at ICCAT. These problems delayed assessment of the east Atlantic stock.

viii) The section on bluefin tuna in the 1988 SCRS Report should be simplified and more concise for the Commissioners. The technical discussions, procedures adopted, indices and parameters could be attached as an appendix to the Report.

BFT-4.c Management

BFT-4.c.1 East Atlantic and Mediterranean Sea stock

The Committee advises no changes in the existing management measures.

BFT-4.c.2 West Atlantic stock

This year's analysis and those of 1984, 1985 and 1986 are compatible. They all indicate that the spawning stock size has declined sharply since 1970 (Figure 26). They indicate that recruitment and juvenile stock size are substantially lower than in 1970, though it is recognized that changes in availability could affect estimates of the size of recent year-classes. If recent recruitment is as low as estimated this year, rebuilding of the stock will require good recruitment in future years and low fishing mortality on recruits.

In 1984, it was advised that present catch levels were "likely to stop the decline of the stock as well as allow stock increases in the long-term (30 years)." This year's analysis results are compatible with that advice. The SCRS further noted in 1984 that following confirmation that the stock was responding to the present management regime, it would be possible to increase gradually the allowable catch in proportion to the recovery rather than to hold the catch constant for the recovery period (30 years).

As recommended last year, this year's analysis indicates that a 2,660 MT catch limit in the coming year will not prevent a continuing decline in the spawning stock (ages 10+). This year's analysis indicates that good recruitment may be needed to allow the juvenile stock biomass (ages 1-9) to increase (rebuild) again in 1988. The SCRS notes, however, that several years will be needed after a year-class is recruited, before its size can be reliably assessed.

## BIL-B I L L F I S H E S

### BIL-1. Description of fisheries

Billfishes are distributed throughout 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 landings from the Atlantic, if any, are negligible. Major catches of billfishes are incidental to the tuna and swordfish longline fisheries of numerous countries. Secondary fisheries are the directed recreational fisheries of the U.S.A., Côte d'Ivoire, Senegal, Cuba, Mexico, Venezuela, Costa Rica, Bahamas, Portugal (Azores, Madeira), Bermuda, Brazil and numerous other countries in the Caribbean. There are increasing artisanal fisheries for sailfish, especially in Ghana, Senegal and Côte d'Ivoire. Incidental catches of billfishes also occur in the tropical tuna purse seine fisheries. In addition, recent development and expansion of longline fisheries in the Gulf of Mexico, Caribbean Sea and adjacent waters for tuna and swordfish have been reported by various nations. Because these areas are known to have significant concentrations of billfishes, increased incidental catches of these species can be expected.

The most important species in terms of weight of landings in recent years are sailfish/spearfish, followed by blue marlin and white marlin. However, catches can vary according to area and deployment of gear. Sailfish and spearfish are often treated as a species group, since the longline statistics for these species are mixed. The catch statistics for blue marlin and white marlin, by countries are given in Tables 12 and 13, respectively. Catch statistics for sailfish/spearfish are provided in Table 14.

### BIL-2. State of the stocks

No new analyses on the status of stocks of billfishes have been presented to the SCRS since 1982. This is largely due to deficiencies in catch, effort, and size data, in addition to a lack of basic biological parameters which are needed for definitive stock assessment. Consequently, only summaries of the state of the stocks based on analyses presented in previous years are provided. However, in an effort to deal with data deficiencies, the ICCAT Program of Enhanced Research for Billfish (SCRS/87/14) was established in 1986 and initiated in 1987 (SCRS/87/18).

BIL-2.1 Blue marlin

Total Atlantic landings of blue marlin (Table 12) remained stable at about 2,800-3,000 MT from 1970-75. Landings declined steadily through 1979, then increased through 1982, mostly due to increases in the Japanese catch. The 1983 landings declined to 1,600 MT and landings increased to about 2,100 MT the following two years. Preliminary estimates for 1986 show a slight decline to around 1,800 MT. North and South Atlantic regions show trends similar to those for the total Atlantic.

Japanese CPUE indices, 1962-80, were presented at the 1982 SCRS meeting. Catch-per-unit-effort increased slightly during 1977-80, but only to a level well below the 1965-75 average. Production model results based on these indices, (SCRS, 1982) indicate that some over-exploitation may have occurred during the early to mid-1970's, but fishing effort in 1978-80 appears to have been below the level associated with maximum sustainable yield.

Standardized CPUE from 1972-86 for the U.S. recreational fishery was at or below the 15-year average from 1972-78 (except for 1974) and since 1979 has been at or above this average (SCRS/87/68). Cuban longline CPUE for blue marlin increased three-fold from 1970-84 due to improved fishing methods (SCRS, 1987). However, during this same period average weight in the catch dropped substantially from 145 kilos to less than 60 kilos.

The Committee had previously expressed concern about any increase in effort on the stock because of the relatively low longline CPUE levels (through 1978) and the production model results discussed above. While the Atlantic-wide effort may have decreased, moderate expansion and maintenance of longline fisheries in areas of known blue marlin abundance (Gulf of Mexico and Caribbean Sea) continue to reinforce the concerns expressed by past committees.

BIL-2.2 White marlin

Landings from the total Atlantic (Table 13) remained at about 2,100 MT from 1970-72 and then decreased (with fluctuation) over the period 1973-1982 (1,750 to 1,100 MT). Landings increased in 1983 (1,700 MT) and decreased in 1984-86 to about 1,300 MT (preliminary estimates). It was noted that Japanese CPUE indices have declined substantially over the period 1962-80 (SCRS, 1982). Standardized CPUE from the U.S. recreational fishery fluctuated in a narrow range between 1972-74 and then declined steadily through 1978. From 1978-80, the CPUE doubled and then declined continuously during the next six years to about its lowest level in this time series (SCRS, 1987). Although the Committee remains unsure of the exact status of white marlin, the low CPUE levels from the Japanese fishery (through 1980) presented in previous years, as well as declining recreational CPUE from the U.S. fishery, are of significant concern.

BIL-2.3 Sailfish/spearfish

Landings from the total Atlantic (Table 14) declined steadily from 1970 to 1975 (3,000 MT to 1,200 MT) and then increased to 3,300 MT by 1979.

Landings were about 2,200 MT between 1980-82 and increased again to 3,700 MT by 1986 (preliminary estimate). This increase was due largely to increased catches from Ghana and Senegal. Longline statistics are reported as sailfish/spearfish, whereas recreational and artisanal landings concern sailfish only.

BIL-2.3.a West Atlantic

There were no new analyses presented this year. Studies presented in previous years (1960-80) indicated that catch rates from the Japanese longline fishery have fluctuated without apparent trend (SCRS, 1982). Size composition of samples from the U.S. recreational fishery indicates that average size has declined since the 1950's but the size composition appears to be quite stable over the past ten years or so (SCRS, 1983). Size composition for the Japanese longline fishery, available only for 1971-76, is also stable (SCRS, 1983). Yield-per-recruit analysis indicates that recent fishing mortality levels are about 20 percent below $F_{0.1}$ (SCRS, 1983). Considering these data collectively, sailfish appear to be only moderately exploited. The Committee cautioned that further analysis (e.g., VPA and/or production model analysis), in conjunction with Y/R analysis, would be needed before a more definitive assessment of the status of stocks could be made. However, deficiencies in these data make use of the more sophisticated techniques inappropriate at the present time.

BIL-2.3.b East Atlantic

Japanese CPUE of sailfish/spearfish (SCRS, 1982) declined from the mid-1960's to the early 1970's, then fluctuated without trend until 1980. Senegalese artisanal CPUE of sailfish, 1970-80, has also fluctuated without apparent trend (SCRS, 1980). However, effort in this fishery is hard to determine. There are no other means to evaluate the east Atlantic stock at this time and the Committee remains uncertain of the status of the stock.

## BIL-3. Effects of current regulations

No ICCAT regulations are currently in force for billfishes.

## BIL-4. Recommendations

BIL-4.a Statistics

i) Catch, effort, and size statistics (both commercial and recreational) from all countries should be reported by five-degree area and by month. The catch of each billfish species should be reported separately; this is one of the most severe problems with industrial longline landing statistics of billfishes. While the Committee noted that some progress has been made in this area, continued adherence and improvement is still necessary. The well established sexually dimorphic size differences of billfishes, particularly blue marlin, makes the collection of size of landings by sex very important. The Committee especially noted the need for progress in this area.

ii) Catch statistics for sailfish and spearfish, in particular, should be reported separately in the future 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. The historical statistics should also be separated in this manner. ICCAT billfish areas should also be adjusted to accommodate the east/west stock structure hypothesis.

iii) There are several cases where data on billfish effort and size statistics are used for national analyses but the basic data are not submitted to ICCAT. The Committee recommends that the Secretariat secure these data and add them to the ICCAT data base.

iv) A description of the sailfish fishery in Ghana and other west African countries is needed, in particular, the methods of determining landing statistics need to be documented.

v) Improved reporting of catch and effort statistics for historical, as well as newly developed recreational billfish fisheries, is needed. These data should include size of landings by sex, if possible.

BIL-4.b Research

The lack of basic data on age and 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, specific plans concerning research activities, and short- and long-term action items are given in the "Report of the Working Group on the ICCAT Enhanced Research Program for Billfish" (attached as Appendix 6). In addition, the general recommendations of the Committee include:

i) Studies be continued on age and growth of marlins and sailfish and that findings be reported.

ii) Further analyses of both commercial and recreational fisheries data for billfishes should be done to determine indices of abundance which account for changes in the effectiveness of fishing effort. Data on catch and effort should be summarized and made as complete as possible (including estimation of unrecorded by-catch) for use in assessment.

iii) Stock assessment work on the artisanal sailfish fishery should continue, in particular, VPA on the eastern Atlantic stock should be conducted. Improvements in the data base and better estimates of population parameters (due to recent advancements) should enable more progress to be made in this area. In addition, the Committee recommends that the data available on the Senegalese artisanal sailfish fishery be analyzed.

iv) An accelerated tag, release and recapture program for billfishes would increase our knowledge of movement and migration patterns and, when sizes are available, estimation of growth rates. In addition,

the recapture of tagged billfish and particularly the recovery of their skeletal structures would greatly improve estimates of age and growth rates. ICCAT has made attempts to acquire these data in the past (1983) and should incorporate this approach on a continuous basis, (i.e., every year).

v) Research evaluating the survival of released billfish should be initiated.

vi) Several longlining nations reported that some of their fishing operations were deploying longline gear in non-traditional ways, e.g., deep longlining for bigeye tuna (Japan and Korea). Such differences in the type and deployment of longline gear appear to affect the catchability of some species of billfishes (as well as other species), as indicated in a recent preliminary analysis (SCRS/86/81). It is requested that nations employing more than one type of longline gear initiate rigorous analysis comparing the catchability of billfish (and other species) among these different types of longline gear. If catchabilities are found to be significantly different, it may become necessary to stratify catch and effort data by depth of fishing or gear type for the purpose of effort standardization for stock assessment. In addition, it may be possible to apply these results in certain instances to reduce the incidental longline catches of such species as marlin and sailfish.

BIL-4.c Management

No management recommendations are made at this time, except to stress the need to closely monitor the billfish fisheries, particularly the CPUE and catch and size frequency for blue marlin and white marlin, which have shown some indications of a downward trend, but with fluctuations. Considering these points, increased monitoring of landings is particularly important at this time in light of the longline activities in the Gulf of Mexico, Caribbean Sea and tropical Atlantic, and changes in traditional deployment of longline gear. Should future analyses indicate that the downward trends in catch rates have continued with the present or increased level of effort, it may be necessary to recommend some form of management in the future.

## SWO-S W O R D F I S H

### SWO-1. Description of fisheries

The three fishing gears used to target swordfish in the entire Atlantic and Mediterranean are (in order of importance): surface drift longline, gillnets and harpoon. Catches by surface drift longline comprise more than 80 percent of the total swordfish catches, whereas gillnets and harpoons are used in locally defined fisheries; the harpoon fishery has a long,

traditional history. There are also some incidental swordfish catches by other gears, such as traps, trawls, etc.

Longline gear is used over an extensive geographical area in the Atlantic and Mediterranean Sea because of the wide distribution of swordfish.

The total estimated swordfish catch for the Atlantic and Mediterranean was 35,000 MT in 1986, of which 38 percent were from the Mediterranean (Table 15).

The swordfish catch estimated for 1986 assumes the catches of some countries to be similar to those of 1985; this estimate is preliminary and may change. At any rate, it is the highest swordfish catch of the historical series and is more than three times the 1972 catch.

The historical series for the Mediterranean is slightly improved after 1984, since more precise data on Italian catches became available.

The preliminary results of a study on the Greek longline fishery, financed by the EEC, showed that a swordfish longline fishery has been in operation for about 20 years in the waters around Greece. This fishery operates throughout the year, with maximum activity in the spring and summer. The fleet is comprised of several hundred boats for which the CPUE seems to be very similar to that of the Spanish Mediterranean longliners (SCRS/87/36). Biological sampling as well as tagging is also carried out. The definitive results of this study will be available at the next SCRS meeting.

Due to the increased demand for swordfish, new fisheries, such as the Portuguese fishery (peninsula and Azores), have recently started using longlines directed at swordfish.

Figure 27 shows the spatial analysis of the CPUE data ($5^{\circ}$ x $5^{\circ}$) of the Spanish longline fleet, where it is noted that the areas of high CPUE coincide with the fishing areas of recent access by the Spanish fleet.

Figure 28 shows the historical CPUE series of the Japanese longline in four areas (Figure 29), between $20^{\circ}$ S and $45^{\circ}$ N from 1956 to 1985. Figure 30 shows the CPUE ($5^{\circ}$ x $5^{\circ}$) for the same fleet between 1983 and 1985.

Figures 31 and 32 present distribution of Japanese longline CPUE by $5^{\circ}$ x 5 areas for the historical series 1957-83. The CPUE distribution does not seem to show clear east-west distribution boundaries between important catch areas, which would help to define the populations. However, areas of concentration do occur in some areas which vary over time and which are clearer in November and December.

## SWO-2. State of the stocks

The Committee favored the single-stock hypothesis for the North Atlantic as a working hypothesis for stock management purposes. However, the Committee also felt that the two-stock hypothesis (i.e. east and west Atlantic) could not be discarded. Should the two-stock hypothesis be used

in any assessment work, the mixing of fish between east and west should be incorporated into the analysis.

For the South Atlantic, the Committee's consensus is that the stock should be considered separate from the North but as one stock in the south; primarily due to the lack of any evidence of SW and SE separation. However, the concentration off the tip of South Africa suggested some exchange of fish between the Indian Ocean and the Atlantic Ocean.

The Committee also recognized that the biological stocks could be different from fishery management units. For example, even if each and west stocks exist, the degree of mixing may make it difficult to assign the catch to the proper stock.

After reviewing landings and size frequency data, and developing catch-at-age tables for five areas (Figure 33) for 1978 to 1985, insufficient time remained to conduct analytical assessments. The significant data base improvements, which were accomplished during this year's Workshop, will allow for these quantitative assessments on an Atlantic-wide basis.

A preliminary analysis of standardized Spanish CPUE for the north-eastern and central Atlantic was conducted (Figure 34) and the catch-at-age tables were reviewed for general qualitative information on the status of stocks (Tables 16 to 20).

According to the tables, the Committee noted the following:

a) In Areas 1-2-3 (NW Atlantic), it was noted that the number of fish caught per year varied between 90,000 and 130,000, from 1978 to 1980, then decreased to around 90,000 fish/year with no trend, with an increase in the harvest at ages 0 and 1 from 1978 to 1985.

b) In Area 4-A (N central Atlantic) the number of fish caught per year decreased from 56,000 to 29,000 from 1978 to 1983. However, in 1984 and 1985 the number of fish increased, partly due to increased effort in this area by the Spanish fleet. The range of ages exploited remained constant.

c) In Area 4-B (E Atlantic) the number of fish caught increased, particularly after 1983. A majority of the catch consisted of fish 1 to 4 years old.

d) In Areas 6 and 7 (S Atlantic) there was a constant increase in the number of fish caught after 1978, whereas the range of ages exploited (2-6) was similar throughout the period.

e) For the Mediterranean the number of fish caught remained relatively stable (160,000-200,000 fish/year) up to 1982. After that, there was a big increase in catches, reaching a maximum of 621,000 in 1984. A part of the increase should be attributable to the improvement of catch statistics. However, these fluctuations were observed with caution due to the general lack of precise information on the catches and size distribution in the Mediterranean. The majority of the catches correspond to ages 0 and 1.

## SWO-3 Effects of current regulations

There are no ICCAT regulations for swordfish. The SCRS was informed that Italian laws specify a minimum size of 1.4 meters. The effectiveness of that regulation could not be evaluated by the Committee.

## SWO-4 Recommendations

### SWO.4.a Statistics

i) All countries should report swordfish catch and effort statistics by five-degree rectangles (or smaller area) by month.

ii) The statistical and sampling areas used by ICCAT were studied and the areas shown in Figure 33 to compile catch and size data were adopted. Catch-at-age tables should be created for 5 areas (1+2+3, 4-A, 4-B, 5, 6+7).

iii) All countries catching swordfish (directed or by-catch) should carry out adequate levels of size sampling and, when possible, sample for sex.

iv) All countries which have a major swordfish fishery should submit a 1986 catch-at-size table by a set date agreed upon by the SCRS. The table should be in the format agreed upon at this meeting, i.e., by sampling areas, month, gear, and size (in original units). Size measurements should be kept in the smallest increments possible.

v) Because of under-reporting problems for the Mediterranean, the Secretariat should contact the appropriate governments to acquire more accurate, current and historical data.

vi) Selected length to weight conversion equations for specific areas (Table 21) for calculating Task I landings should be used.

vii) Detailed size frequency data should be made available so that substitutions could be matched at the smallest time-area strata possible.

### SWO-4.b Research

i) Emphasis should be placed on developing additional estimates of growth rates based on validated information. Modal analysis of size composition in conjunction with hard-part studies is encouraged, especially for the Mediterranean region; and if possible, the ages associated with the modes should be established.

ii) All the techniques to identify stock(s) should be used, including age, growth, maturity, etc., particularly for South Atlantic and Mediterranean fish.

iii) Scientific tagging should be intensified in the future, particularly in view of increasing commercial value and expanding fisheries for this species. The Committee acknowledged the large number of releases made by the U.S. observers aboard Japanese longliners and hoped that this program would continue.

iv) Analysis of changes in the effectiveness of fishing effort should be continued in order to improve indices of abundance.

v) Since CPUE information submitted by the different countries comes from different time-area strata, gears, and fishing methods and is expreesed in different units, the Committee recommended as a basic objective the standardization of CPUE. In order to standardize CPUE, it will be necessary to identify the time, area, gear characteristics, or other factors that affect catchability. This can be accomplished with statistical methods, such as Generalized Linear Model (GLM). A joint comparison of Japanese, Spanish and United States CPUE data was also recommended.

vi) The reason(s) for the predominance of females in the large-size classes should be investigated.

The SCRS noted that the work commenced by this year's Workshop should be continued and completed in the future, especially with regard to analytical assessments which could not be carried out due to time limitations. Therefore, it is the Committee's opinion that even if all the countries carry out the recommendations outlined above, it will be necessary to hold another inter-sessional meeting.

SWO-4.c Management

No management recommendations were presented.

## SBF-S O U T H E R N  B L U E F I N  T U N A

### SBF-1 Description of fisheries

Southern bluefin tuna occur in the higher latitudes of the southern hemisphere. The spawning area is known only in the middle latitudes of the eastern Indian Ocean. Juveniles are found in the coastal waters around southern Australia. As they grow, they migrate highly and circumpolarly throughout the southern Pacific, Indian and Atlantic Oceans.

The stock has been exploited by Australians (poling, purse seining and, to a small extent, trolling) and Japanese (longlining) since the early 1950's. The Japanese catch increased to the maximum of 77,500 MT in 1961. Since then it has been decreasing. The Australian surface fishery, catching mainly juveniles, has gradually grown to the extent allowing catches of 10-12,000 MT in the late 1970's and the maximum catch of 21,500 MT in 1982,

but recently its catches have decreased due to new restrictions. Recently, New Zealand fishermen have also indicated interest in exploiting large fish by handlining and trolling, but their catches are still very small (below 200 MT per year). The catches by Japanese, Australian and New Zealand fishermen in 1986 were about 17,000, 12,500 and 100 MT, respectively. In the Atlantic, southern bluefin are caught by the longline fishery in the area off the southern coast of Africa, and the Japanese catch in 1986 was estimated to be 350 MT. During the past ten years, the catch fluctuated greatly between 500 and 6,200 MT (Table 22), reflecting the shifts in fishing effort among oceans.

## SBF-2 State of the stock

At the Sixth Meeting of Australian, Japanese and New Zealand scientists held in Hobart, Australia, in August, 1987, the status of the stock was re-evaluated on the basis of data on gross catches, catch length frequencies, fishing effort and tag releases and recaptures. The significant reduction in the parental biomass from the pre-exploitation level, which was identified during the past five meetings, was re-confirmed. Computer simulations as well as the continued failure of the domestic New South Wales fishery and a recent decline in abundance of 4-7 aged fish suggested that the parental biomass is likely to decline further in coming years. It was pointed out that there would be a risk of recruitment decline if the current catch limits were maintained. Governments of the three countries were recommended to take immediate steps to ensure that future major reductions in catch can be implemented quickly and effectively if a continuing decline in recruitment was indicated.

## SBF-3 Effects of current regulations

The first management regulations for the fishery were introduced independently by Australia and Japan in the early 1970's. Australia limited the number of purse seiners to six and their operation to the waters off southeastern Australia. This was done for both biological and economic reasons. Since 1971, Japan has voluntarily restricted fishing in areas where juveniles are abundant. This measure was introduced to increase the age at first capture to obtain a higher yield per recruit.

Since the 1984 fishing season, Australia has maintained a national quota of 14,500 MT and a seasonal area closure off western Australia. Japan and New Zealand introduced national quotas of 23,150 and 1,000 MT for the 1986 fishing season, respectively. Recently, Australia and Japan reduced their catch limit to 11,500 MT (from the 1986 fishing season) and 19,500 MT (from the 1987 fishing season), respectively.

## SBF-4 Recommendations

The Committee did not recommend any management measures for southern bluefin tuna in the Atlantic Ocean, since the stock has been monitored carefully by other international regimes.

# SMT-S M A L L  T U N A S

## SMT-1. Description of fisheries

About ten species make up the small tunas group from the point of view of tonnage. Four species represent more then 80 percent of the entire catch in weight, and they are: Atlantic bonito, Atlantic black skipjack (formerly called little tuna), frigate tuna and spotted Spanish mackerel.

Table 23 provides the best statistical data available on small tunas in the Atlantic and Mediterranean. However, the 1986 data are incomplete; the catch data from the large purse seiners from operating off the African coasts, probably around 7,000 to 8,000 MT/year of essentially frigate tuna and Atlantic black skipjack, are not complete: they are either not registered in the logbooks because they are discarded or are not reported.

In spite of this, the total catches of small tunas in the recent 1984-1986 period are around 90,000 MT, while they were around 120,000 MT in 1980-1983. These lower catches reflect a decrease observed in the Turkish catches of Atlantic bonito in the Mediterranean, from 30,000 MT in 1983 to 8,000 MT in 1986 and the reduction in U.S.S.R. catches of Atlantic black skipjack in the Atlantic from 6,000 MT to 1,000 MT during the same period.

The catches of other species made by the other fisheries were stable with an increase in the catches of Scomberomorus spp. by U. S. fisheries in 1986. These catches exceeded those of other tuna species in the area. This increase is due to better statistical coverage, especially in the reporting of catches by sport fisheries. Moreover, the insufficiency of the sampling explained, in part, the decrease in catches of Acanthocybium in Cape Verde during the last few years, in spite of the stability of fishing effort of the vessels responsible for these catches.

It is also interesting to note that there is an improvement in the statistical coverage due to an increase in the number of countries reporting their catches of small tunas (from 28 in 1971 to 43 in 1986) as well as to an improvement in the species composition of the reported catches.

## SMT-2. State of the stocks

The stocks of small tunas are generally coastal and can be managed locally better than the stocks of large deep-water tunas, but the current available information does not often allow us to draw any conclusions on the state of these stocks; it is probable, however, that some are underexploited.

Stock evaluations of Scomberomorus spp. have been made for the Exclusive Economic Zone of the United States but these studies have not been submitted to the SCRS.

## SMT-3. Effects of current regulations

The "U.S. Fishery Management Plan for Coastal Migratory Pelagic Resources (Mackerels) in the Gulf of Mexico and South Atlantic Region" was approved and is in effect in the Exclusive Economic Zone of the United States. It provides for a total allowable catch (TAC) for Scomberomorus spp. These TACs are divided by area and between the commercial and sport fisheries. The TACs and the allocations are adjusted each year. These regulations permit restricting the overall fishing mortality.

## SMT-4. Recommendations

### SMT-4.a Statistics

The statistical catch and effort data of small tunas are very incomplete for most of the coastal countries. Therefore, the Committee recommends that:

i) Member countries make special efforts to report their catches of small tunas by the different fisheries (artisanal, industrial, sport), as well as the corresponding effort, as far as possible.

ii) Estimates be made of the discards along the African coasts and the unreported selling from purse seiners, as well as estimates of the size of individuals of the respective species.

iii) The Secretariat take the necessary steps to secure appropriate data from non-member countries, especially those from the Mediterranean and the Atlantic coast of Africa.

iv) Catch statistics of the most important species (Atlantic black skipjack, frigate tuna, Atlantic bonito, and spotted Spanish mackerel) be presented by gear and country, in order to follow the developments of the different fisheries.

v) The countries with major small tunas fisheries prepare as soon as possible documents describing their methods of collecting and processing statistical data so that the Secretariat may prepare a sampling manual for the secondary species.

### SMT-4.b Research

The Committee recommends that:

i) Studies be made to provide or complete biological data of the main small tunas species (area and time of reproduction, growth, etc.), especially in areas where the important fisheries operate.

ii) Studies aimed at defining the size and structure of the stocks, as well as the migratory schemes of the species, be carried out. Tagging cruises would be interesting for this type of study.

iii) Studies on the ecology of small tunas in general and their association with juvenile tunas in the concentrations be continued.

iv) A method for estimating fishing effort be studied, in order to measure the effective fishing pressure applied to these species, often caught at the same time as the target species.

v) Studies dealing with stock evaluation of small tunas be available to the SCRS.

SMT-4.c Management

The Committee has no recommendation for management of the small tunas stocks.

## MLT-M U L T I - S P E C I E S  I N T E R A C T I O N S

No document presented to the Committee dealt explicitly with this problem which is still of vital importance for longline as well as surface fisheries.

Some serious problems remain in interpreting the longline CPUEs. The longline is, by definition, a gear that simultaneously catches various species (tunas, swordfish, billfish, and others) and one that can change target species in a way that is difficult for scientists to monitor. A similar problem occurs with changing fishing seasons and areas and with changing depths at which the lines are set. The latter problem appears, for example, in the interpretation of the catch rates of deep longline as the CPUEs of different species are changed by the depth of the hooks. These changes are difficult to interpret and to correct in the calculation of specific abundance indices.

Problems in species identification are raised for the purse seine fisheries which easily change their target species, for example, between yellowfin and skipjack. The problem is clearly posed during the recent period (1980-1986) when yellowfin was sought less by some fleets, because of low abundance, and it seems yellowfin is once again becoming the target species during the current recovery phase of the stock.

The problem which has not been studied in detail should be carefully analyzed while carrying out analyses during the final phase of the Yellowfin Year Program.

## Item 10. REVIEW OF THE PROGRESS MADE BY THE YELLOWFIN YEAR PROGRAM

Dr. A. Fonteneau (France), General Coordinator of the Yellowfin Year Program, reported on the results of the meeting of the Program Activity Team Leaders, held in Dakar, Senegal, at the same time as the meeting of the

Working Group on Juvenile Multi-Statistics. The Report (SCRS/87/7) summarizes the activities of late 1986 and early 1987 and proposes some future work, particularly concerning data management and termination of the Program.

The Committee reviewed and adopted the Team Leaders' report (Dakar, July 1987). It is attached as Appendix 4 to this Report.

Dr. Fonteneau further suggested that a review of progress made in the last few months since the Dakar meeting be made during this session and that future plans of the Program be agreed upon at this time. The SCRS Chairman decided to hold a small working group meeting, during this session, of scientists involved in the Program.

At a later session, the report of this Group was presented by its rapporteur, Mr. J. Pereira. It was recognized that the Program terminates at the end of 1987 and follow-up studies are expected for growth, data processing and over all analyses. A meeting for data preparation is expected in July in Dakar, at which participation of a Secretariat data base expert was requested. After some discussion on the timing of this meeting, it was decided that the final meeting of the Program to finalize the overall analyses would be held in Madrid towards the end of the first quarter of 1989.

Some discussions were held as to whether some scientists could be invited to this meeting by applying funds left over from the Program. It was agreed that participants should utilize their national funds to attend the meeting, considering that funding for this Program had come from the Working Capital Fund, rather than from member country contributions.

The Group estimated that US$25,000 would be required to terminate the Program and requested that this amount be reserved from the unused balance. Itemized foreseen expenses are also included in the Group's Report.

The Committee also adopted the Report of the Small Working Group (Madrid, October 1987) and reiterated all the recommendations contained therein. This Report is attached herewith as Appendix 5.

## Item 11. REVIEW OF THE PROGRESS MADE BY THE PROGRAM OF ENHANCED RESEARCH FOR BILLFISH

In the absence of the Program's Genberal Coordinator, Dr. B. Brown (U.S.A.), Dr. E. Prince (U.S.A.) reported on the progress made during 1987 on the Program of Enhanced Research for Billfish. He presented the Program Plan (SCRS/87/14) agreed upon by the pertinent scientists. He commented that the Plan is final but that modifications can still be introduced during the session.

Dr. Prince then presented document SCRS/87/18, which describes the progress made. Since adoption of the Program Plan was delayed, activities in the first year were somewhat limited but good progress was made in the observer program, port sampling, and tagging. He also informed the Committee that full funding is now available for the Program.

The SCRS Chairman proposed holding a meeting of the scientists involved the Program during this SCRS session to review the Plan as well as to schedule future activities. With the understanding that the Plan may be modified according to the situation, the Plan was adopted, and it was decided that it should be issued as an independent publication such as the Yellowfin Year Program Plan.

At later session of the SCRS, the results of the meeting of scientists involved in the Program were reported by the Program Coordinator. Although the Group proposed some minor modifications to the Plan, the Plan is quite flexible and there is no problem to accommodate such changes.

The Report was adopted (Appendix 6) and the Committee reiterated all the recommendations included in it. Recognizing the recommendation made by the Group to have two coordinators, one for the east and one for the west under the General Coordinator, the SCRS Chairman nominated Mr. T. Diouf (Senegal) as east Atlantic Coordinator, and Dr. E. Prince (U.S.) as west Atlantic Coordinator.

## Item 12. 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 its Convener, Dr. R. Conser (U.S.A.). He summarized the discussions which took place at the meeting and pointed out all the recommendations which the Sub-Committee forwarded to the SCRS.

The Committee was informed that there has been considerable progress made by the scientists and the Secretariat on the statistical assignments, but there is still much to be done. In addition, the SCRS was informed that the present computer system available at the Secretariat is insufficient to provide support for scientists when they try complicated data analysis and/or to assess stocks of more than one species. In order to facilitate the scientific work, the Sub-Committee proposed the addition of some computer hardware and software to the Secretariat's computer. Details and priorities are given in the Addendum 2 to the Sub-Committee Report. The SCRS endorsed all the recommendations in the Report.

The Committee reviewed and endorsed various other recommendations made by the Sub-Committee. The Report of the Sub-Committee on Statistics was adopted by the SCRS and is attached herewith as Appendix 7.

## Item 13. REVIEW OF EDITORIAL AND PUBLICATION POLICY

The Committee reviewed SCRS/86/13, dealing with the Commission's publications on research and statistics. It confirmed that the Statistical Series has been discontinued and that the data are now presented in a much more summarized form in the Data Record.

The draft of the Historical Series of Statistical Bulletin for 1970 through 1979 was made available in 1985 and the data have been fairly well reviewed ever since. Therefore, the Committee recommended that the Secre-

tariat publish the final version of Historical Bulletin No. 3 covering the period of 1970-79, as soon as possible.

## Item 14. REVIEW OF FUTURE SCRS RESEARCH PROGRAMS AND CONSIDERATION OF SCRS MEETING PROCEDURES

### 14.1. Meeting Organization

The Committee evaluated, from the point of view of the SCRS, the new meeting organization which the Commission tried this year. The SCRS felt that there are many advantages to the new scheme as well as some disadvantages as had been foreseen. Recognizing that the Commission has to decide on next year's schedule after evaluating the Commission's experience, the Committee summarized its own view as follows:

a) Place of the SCRS meeting

Although there were some reservations expressed as to whether the SCRS has to do all the analyses such as was done for bluefin during the SCRS, it was agreed that the most logical place for the scientific committee to meet is in Madrid because of access to the computer and since it is the most economical since all the Secretariat facilities could be used.

b) Timing of the SCRS session

There was a consensus that this year's meeting was scheduled too early to permit the scientists to make analyses based on the most recent data base, since most of the data did not become available until immediately prior to the SCRS Meeting. The Committee recommended that the 1988 meeting be held in early November.

c) Meeting period

This year, the meeting started on a Wednesday and after the formal opening of the SCRS the species groups met towards the weekend. This system was considered much more convenient for the Committee, since drafting of the species sections could be done over the week-end. On the other hand, the sessions which required interpreters were split by several days and this could cause some financial problems in the future in terms of securing interpretation services and equipment.

The Committee recognized that the bluefin draft did not become available until the second to the last day of the Committee. In order to have the bluefin draft in time for presentation at the Committee, the SCRS decided that bluefin scientists would start their work one day earlier than the rest of the SCRS.

With this exception, the SCRS recommended that the next SCRS session be scheduled to include eight working days, five days of which should be with interpreting services. Should the Commission decide that the SCRS will meet in the week preceding the Commission meeting, some consideration should be given to starting the SCRS Meeting in mid-week, so that the Committee can take advantage of the weekend at the end of the species groups meetings.

d. Separation of SCRS from the Commission meeting

The opinions expressed by the scientists on this point differed considerably. The main advantages of holding separate meetings is it gives Commissioners more time to read and digest the scientific findings before the Commission meeting begins, and scientists can inform Commissioners in their own countries rather than at the meeting in the very short period between the SCRS and Commission sessions.

The disadvantages are that some scientists may have to make two trips within a short period, which could impose economic hardship on some countries, or that Commissioners may have to attend the meeting without their national scientific advisers. In addition, it could result that the opinions of the SCRS may not be well reflected in the Commission's discussions.

14.2 Intersessional meetings

The SCRS Chairman noted that there were two inter-sessional meetings recommended by various groups: a Swordfish Workshop to finish the stock assessments, and a data preparation meeting for the Yellowfin Year Program.

a. Swordfish Workshop

Scientists at the 1987 Workshop requested that another workshop be held in 1987 to complete stock assessment work. All the participants agreed that the 1988 session should not be held at the same time as, nor immediately prior to, the SCRS meeting, even though this may mean extra travel costs for the national scientists.

The Committee recommended holding another Workshop in June or July, 1988, for five or six working days. The 1986 data should be included in the data base before the Workshop. Details of the schedule should be decided upon later through the correspondence.

b. Data Preparatory Meeting for Yellowfin Year Program

The Committee approved the recommendations made by the Yellowfin Year Program to hold a meeting in Dakar, in July, 1988. The SCRS Chairman asked Dr. A. Fonteneau, Program Coordinator, to make all the necessary arrangements for the meeting.

Item 15. COOPERATION WITH OTHER ORGANIZATIONS

The Committee noted with satisfaction that ICCAT maintained close cooperation with various organizations regarding tuna statistics, as reviewed and presented in the Report of the Sub-Committee on Statistics (Appendix 7). The Committee recommended that such activities be continued.

It was commented that scientific meetings which the Secretariat might attend should be carefully selected in view of the Commission's austere budget. The Committee was informed that in 1987, the only trips made were to attend the CWP in Rome and the Consultation on Global Tuna Statistics in La

Jolla. In addition, some scientists have been asked to represent the Commission at some meetings they were attending as national representatives. This practice should be encouraged to save Commission funds.

Item 16. RECOMMENDATIONS

The SCRS's recommendations concerning statistics, research and management of tuna species are found in Section 4 of each of the respective species sections of Agenda Item 9 of this Report and in the Report of the Sub-Committee on Statistics (Appendix 7).

In response to an assignment given to it by the Commission in 1985 regarding the development of a program for comprehensive billfish research, the SCRS began the "Program of Enhanced Research on Billfish". Details are reviewed under Agenda Item 11 and in Appendix 6 to this Report.

The results of the 1987 Swordfish Workshop are reviewed under Agenda Item 7 and another Workshop was proposed under Agenda Items 7 and 14.

The Yellowfin Year Program is approaching its end and plans for finalizing the Program are discussed under Agenda Item 10 and in Appendix 5 to this Report. An inter-sessional meeting for data preparation is scheduled for 1988 (Item 14) and a data analysis meeting is scheduled for early 1989.

The Committee's evaluation of the new organization of the meeting adopted for this year can be found under Agenda Item 14.

The Commission's attention of the Commission is drawn, in particular, to the discussions held during the Meeting of the Sub-Committee on Statistics (Appendix 7) under Agenda Item 6.7, concerning the additional equipment required for the computer as identified by the scientists.

Item 17. OTHER MATTERS

Since the ICCAT standard tag reward of $4 is no longer attractive for many fishermen, the possibility of developing an alternative incentive to encourage tag recoveries was discussed. Although it is the responsibility of each member country to pay tag rewards, the Commission may help the national scientists by providing informative material for fishermen about tuna.

After some discussion, it was agreed that the number of copies of the Newsletter should be increased in the future, so that the national scientists could make a bulk order for enough copies to distribute to their fishermen collaborators. The Newsletter should then include more summaries of scientific findings, such as a summary of the Swordfish Workshop. As a first trial, the Spanish scientists were asked to draft a short summary with illustrations and tables to address the non-scientific community.

Item 18. ADOPTION OF REPORT

The Report was reviewed and, after some modifications were made the Report was adopted. While adopting the Report, it was agreed that scientists

participating in the session would deliver the Report, with errata, to their respective Commissioners and that the Secretariat would also air mail copies to the Commissioners as soon as possible. These copies may not be well edited nor checked for accuracy of translation at this time, but they should at least include all the corrections made just prior to adoption.

Item 19. ADJOURNMENT

The meeting was adjourned.

Table 1. Atlantic yellowfin catch (1,000 MT)

| | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL | 93.4 | 94.6 | 106.7 | 124.6 | 123.0 | 128.7 | 130.5 | 124.8 | 125.4 | 151.2 | 159.8 | 160.5 | 111.6 | 149.8 | 154.0 |
| EAST ATLANTIC . . . . . | 78.1 | 79.7 | 92.2 | 108.1 | 109.2 | 115.3 | 115.7 | 111.7 | 112.4 | 134.8 | 134.3 | 123.4 | 75.3 | 111.9 | 108.6 |
| -SURFACE . . . . . | 60.0 | 59.2 | 72.8 | 92.6 | 96.5 | 99.7 | 104.5 | 105.0 | 99.9 | 126.9 | 124.4 | 117.3 | 66.6 | 104.3 | 102.0 |
| BAITBOAT . . . . . | 13.1 | 14.7 | 19.7 | 9.6 | 12.8 | 10.9 | 9.0 | 13.7 | 7.6 | 9.8 | 13.2 | 11.5 | 13.7 | 16.1 | 15.1 |
| ANGOLA . . . . . | 0.6 | 0.6 | 0.8 | 0.1 | 1.0 | 1.9 | 2.0 | 0.8 | 0.5 | 0.7 | 1.4 | 0.7 | 0.2 | 0.3 | 0.1 |
| FIS . . . . . | 7.4 | 5.5 | 6.3 | 2.9 | 3.7 | 3.4 | 2.8 | 2.2 | 2.1 | 2.9 | 3.0 | 2.7 | 3.4 | 2.9 | 3.8 |
| GHANA . . . . . | 0.0 | 0.1 | 0.3 | 0.7 | 0.8 | 0.6 | 0.3 | 1.2 | 1.7 | 2.5 | 5.6 | 5.0 | 5.5* | 8.9* | 8.2** |
| JAPAN . . . . . | 3.5 | 6.5 | 7.1 | 1.1 | 4.9 | 2.6 | 1.4 | 1.0 | 0.5 | 1.7 | 1.2 | 1.0 | 0.1 | 0.0 | 0.0 |
| KOREA + PANAMA . . . | 0.4 | 0.8 | 2.8 | 3.5 | 2.0 | 2.1 | 1.7 | 4.1 | 1.4 | 1.0 | 0.7 | 0.2 | 0.2 | 0.1 | 0.0 |
| ESPANA . . . . . | 0.7 | 0.8 | 2.0 | 1.0 | 0.2 | 0.3 | 0.2 | 0.1 | 0.1 | 0.1 | 0.4 | 0.7 | 2.5 | 2.8 | 1.7 |
| OTHERS . . . . . | 0.5 | 0.4 | 0.4 | 0.4 | 0.1 | 0.1 | 0.5 | 4.4 | 1.2 | 0.7 | 0.9 | 1.3 | 1.8 | 1.1 | 1.4 |
| PURSE SEINE . . . . . | 46.9 | 44.5 | 53.1 | 83.0 | 83.6 | 88.3 | 94.6 | 89.9 | 91.8 | 111.7 | 107.9 | 101.9 | 50.5 | 86.7 | 84.6 |
| FISMP . . . . . | 23.8 | 26.2 | 32.2 | 44.8 | 47.9 | 46.5 | 52.5 | 46.4 | 50.3 | 54.0 | 45.0 | 39.8 | 5.3 | 11.8 | 15.8 |
| JAPAN . . . . . | 2.5 | 1.2 | 0.8 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 | 1.2 | 1.3 | 2.6 | 2.8 |
| ESPANA . . . . . | 8.6 | 13.3 | 14.0 | 23.7 | 33.2 | 35.3 | 33.4 | 39.9 | 38.7 | 51.3 | 53.8 | 51.2 | 37.5 | 64.0 | 60.4 |
| USA . . . . . | 12.0 | 3.0 | 5.6 | 14.0 | 1.7 | 6.4 | 8.1 | 2.9 | 1.6 | 1.5 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| OTHERS . . . . . | 0.1 | 0.8 | 0.4 | 0.4 | 0.8 | 0.2 | 0.6 | 0.7 | 1.2 | 5.0 | 7.7 | 9.7 | 6.4 | 8.3 | 5.7 |
| OTHER GEARS . . . . . | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.9 | 1.4 | 0.6 | 5.3 | 3.2 | 3.9 | 2.4 | 1.5 | 2.3 |
| CAP VERT . . . . . | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.6 | 2.7 | 3.4 | 2.0 | 1.2 | 2.0 |
| OTHERS . . . . . | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.9 | 1.4 | 0.6 | 0.7 | 0.5 | 0.5 | 0.4 | 0.4 | 0.3 |
| -LONGLINE . . . . . | 18.1 | 20.4 | 19.4 | 15.4 | 12.8 | 15.6 | 11.3 | 6.8 | 12.5 | 7.9 | 9.9 | 6.1 | 8.7 | 7.6 | 6.2 |
| CHINA (TAIWAN) . . . | 3.5 | 1.5 | 1.0 | 1.3 | 0.6 | 0.2 | 0.2 | 0.2 | 0.1 | 0.4 | 0.2 | 0.4 | 0.1 | 0.1 | 0.2 |
| CUBA . . . . . | 3.2 | 4.5 | 3.0 | 1.7 | 1.8 | 2.9 | 1.9 | 2.6 | 4.9 | 2.5 | 2.1 | 1.6 | 1.2 | 1.1 | 2.3 |
| JAPAN . . . . . | 2.3 | 1.3 | 0.7 | 1.7 | 0.3 | 0.1 | 0.3 | 0.3 | 1.7 | 1.2 | 2.8 | 0.9 | 2.9 | 3.1 | 1.9 |
| KOREA + PANAMA . . . | 7.9 | 11.9 | 12.2 | 8.8 | 8.5 | 10.7 | 8.4 | 3.1 | 5.6 | 3.6 | 4.7 | 3.1 | 3.9 | 2.9 | 1.3 |
| OTHERS . . . . . | 1.1 | 1.2 | 2.5 | 1.9 | 1.6 | 1.8 | 0.5 | 0.6 | 0.2 | 0.3 | 0.1 | 0.2 | 0.6 | 0.3 | 0.5 |
| -UNCL. GEARS . . . . . | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Table 1 (Cont.)

| | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WEST ATLANTIC . . . . . | 15.3 | 14.9 | 14.5 | 16.5 | 13.8 | 13.4 | 14.8 | 13.1 | 13.0 | 16.4 | 25.5 | 37.1 | 36.3 | 37.9 | 45.9 |
| -SURFACE . . . . . | 3.4 | 2.3 | 1.6 | 2.0 | 0.7 | 1.4 | 4.7 | 3.6 | 5.6 | 4.8 | 15.1 | 29.4 | 27.0 | 26.4 | 3.6 |
| VENEZUELA . . . . . | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 1.8 | 4.4 | 3.5 | 13.9 | 25.3 | 20.2 | 17.7 | 0.0 |
| OTHERS . . . . . | 3.4 | 2.3 | 1.5 | 1.9 | 0.7 | 1.4 | 4.7 | 1.8 | 1.2 | 1.3 | 1.1 | 4.1 | 6.8 | 8.7 | 3.6 |
| -LONGLINE . . . . . | 11.6 | 12.4 | 12.6 | 14.2 | 12.6 | 11.4 | 9.5 | 9.0 | 6.6 | 11.4 | 9.8 | 7.3 | 8.8 | 11.0 | 8.1 |
| CHINA (TAIWAN) . . . | 1.2 | 1.2 | 1.3 | 1.1 | 1.1 | 0.1 | 0.2 | 0.8 | 0.5 | 0.4 | 0.4 | 0.1 | 0.5 | 0.6 | 1.0 |
| CUBA . . . . . | 0.4 | 0.0 | 0.4 | 0.6 | 1.2 | 0.9 | 0.7 | 0.2 | 0.7 | 2.0 | 1.5 | 0.8 | 2.5 | 1.9 | 0.5 |
| JAPAN . . . . . | 4.2 | 2.5 | 2.8 | 2.4 | 3.1 | 1.4 | 1.6 | 1.7 | 1.1 | 3.0 | 3.3 | 1.2 | 1.0 | 2.2 | 1.3 |
| KOREA + PANAMA . . . | 3.3 | 6.5 | 6.5 | 8.9 | 5.9 | 7.1 | 5.0 | 4.4 | 2.7 | 3.6 | 2.9 | 2.0 | 1.2 | 1.7 | 1.2 |
| OTHERS . . . . . | 2.6 | 2.2 | 1.5 | 1.2 | 1.4 | 1.8 | 2.1 | 1.9 | 1.5 | 2.4 | 1.8 | 3.2 | 3.5 | 4.6 | 4.1 |
| -UNCL. GEARS . . . . . | 0.3 | 0.3 | 0.3 | 0.4 | 0.5 | 0.6 | 0.5 | 0.4 | 0.7 | 0.3 | 0.6 | 0.4 | 0.5 | 0.5 | 34.2 |

*Estimated by Dakar group.
**Estimates from Abidjan sampling.

Table 2. Carrying capacity ($10^3$ MT) of yellowfin and skipjack surface fisheries in the east Atlantic (up to Oct. 17, 1987)

| | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| --BB | | | | | | | | | | | | | | | |
| FISM | 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 | 1.1 | 1.0 |
| Tema-based | 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 | 6.6 | 6.6 |
| Spain (Can.) | .6 | 1.0 | 1.9 | 1.6 | .6 | .6 | .6 | .6 | .6 | .6 | .6 | .6 | .6 | .6 | .6 |
| Angola | .3 | | | | | .5 | .5 | .5 | .4 | .5 | .4 | .4 | .4 | .4 | .4 |
| Cape Verde | | | | | | | | | .2 | .2 | 1.0 | 1.0 | 1.0 | 1.2 | 1.2 |
| Portugal | .5 | .5 | .4 | .6 | .3 | .3 | .3 | .6 | .6 | .5 | .3 | .3 | .3 | .4 | 1.0 |
| Total BB | 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 | 10.3 | 10.8 |
| --PS | | | | | | | | | | | | | | | |
| FISM | 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 | 3.0 | 3.0 |
| Spain | 5.2 | 7.1 | 8.4 | 12.6 | 16.8 | 20.7 | 24.4 | 25.9 | 29.5 | 30.6 | 31.7 | 38.0 | 33.5 | 30.3 | 27.3 |
| U.S.A. | 11.9 | 2.9 | 5.5 | 10.4 | 1.7 | 4.2 | 10.5 | 3.2 | 2.2 | 1.6 | 1.3 | 0. | 0. | 0. | 0. |
| Japan | 1.9 | 1.9 | .6 | .2 | | | | | | | .4 | .4 | .4 | .8 | .8 |
| U.S.S.R. | .1 | .1 | .1 | .1 | .1 | .1 | .2 | 1.0 | 3.0 | 3.9 | 4.9 | 4.9 | 4.9 | 5.4 | 5.4 |
| Others** | .9 | .2 | .2 | .4 | .2 | .2 | .2 | .7 | 2.9 | 4.9 | 10.8 | 10.2 | 6.4 | 2.0 | 2.0 |
| Total PS | 29.2 | 24.6 | 29.3 | 40.9 | 36.3 | 39.8 | 52.9 | 47.3 | 54.8 | 57.8 | 65.4 | 70.3 | 50.0 | 41.5 | 38.5 |
| Total PS+BB | 36.5 | 32.2 | 42.3 | 54.1 | 46.0 | 53.5 | 68.4 | 62.0 | 67.6 | 69.6 | 77.1 | 81.8 | 60.7 | 51.8 | 49.3 |
| Effort (fish. days)*** | 16.0 | 24.3 | 24.1 | 32.2 | 33.8 | 26.8 | 37.4 | 43.3 | 54.6 | 57.4 | 66.9 | 69.6 | 40.2 | 37.8 | 28.9 |

*Preliminary
**Ghana (1982-85), Mexico (1983), Congo (1980-81), Gran Cayman (1982-83), Portugal (1979-81), Venezuela (1983).
***SCRS/87/75.

Table 3. Atlantic bigeye catch (1,000 MT)

| | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL | 46.4 | 56.4 | 63.6 | 60.7 | 44.6 | 54.1 | 51.7 | 45.1 | 62.7 | 67.1 | 73.0 | 58.6 | 69.0 | 74.2 | 61.1 |
| -SURFACE | 13.9 | 18.5 | 24.5 | 19.9 | 17.2 | 25.0 | 23.4 | 17.9 | 21.4 | 25.7 | 21.2 | 25.1 | 27.3 | 25.6 | 30.0 |
| BAITBOAT | 9.3 | 13.6 | 17.9 | 14.6 | 9.9 | 12.8 | 14.6 | 9.5 | 12.1 | 9.7 | 6.9 | 9.8 | 11.1 | 17.6 | 15.0 |
| FIS | 1.1 | 1.2 | 1.0 | 1.3 | 1.4 | 2.6 | 3.6 | 2.0 | 2.4 | 2.2 | 1.8 | 2.1 | 2.1 | 4.0 | 3.2 |
| GHANA | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.2 | 0.1 | 0.2 | 0.3 | 0.5 | 0.4 | 0.3 | 1.1* | 1.4* | 1.2** |
| JAPAN | 0.9 | 1.7 | 1.9 | 0.1 | 0.9 | 1.0 | 0.6 | 0.2 | 0.4 | 1.0 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| KOREA + PANAMA | 0.1 | 0.2 | 0.7 | 0.4 | 0.4 | 0.8 | 0.7 | 0.8 | 1.3 | 0.6 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| PORTUGAL | 4.0 | 5.9 | 10.9 | 6.8 | 2.9 | 4.5 | 5.3 | 3.3 | 3.5 | 2.6 | 1.8 | 3.8 | 3.9 | 6.4 | 7.0 |
| ESPANA | 3.1 | 4.4 | 3.2 | 5.7 | 4.2 | 3.6 | 3.8 | 3.0 | 4.0 | 2.4 | 1.5 | 2.5 | 2.8 | 5.0 | 3.5 |
| OTHERS | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.0 | 0.5 | 0.1 | 0.2 | 0.3 | 0.3 | 1.2 | 1.1 | 0.9 | 0.1 |
| -PURSE SEINE | 4.7 | 4.9 | 6.6 | 5.3 | 6.9 | 11.5 | 8.6 | 8.0 | 8.7 | 15.2 | 14.0 | 15.2 | 16.0 | 7.9 | 10.7 |
| FISMP | 2.8 | 3.2 | 4.2 | 3.5 | 5.1 | 6.4 | 5.3 | 5.3 | 3.7 | 6.0 | 5.4 | 6.4 | 2.6 | 1.1 | 1.3 |
| JAPAN | 0.7 | 0.3 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5* | 0.9* | 0.5** |
| ESPANA | 0.9 | 1.3 | 1.3 | 1.6 | 1.7 | 4.8 | 3.0 | 2.4 | 4.4 | 7.6 | 7.5 | 6.2 | 10.8 | 5.4 | 8.6 |
| USA | 0.2 | 0.1 | 0.9 | 0.1 | 0.0 | 0.3 | 0.2 | 0.2 | 0.2 | 0.1 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| OTHERS | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.4 | 1.5 | 0.7 | 2.5 | 2.1 | 1.0 | 0.3 |
| OTHER GEARS | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.7 | 0.2 | 0.5 | 0.6 | 0.8 | 0.3 | 0.1 | 0.2 | 0.1 | 0.3 |
| -LONGLINE | 32.5 | 37.9 | 39.1 | 40.8 | 27.4 | 29.1 | 28.3 | 27.2 | 41.4 | 41.4 | 51.8 | 33.5 | 41.7 | 48.5 | 32.6 |
| CHINA (TAIWAN) | 5.0 | 3.8 | 3.1 | 4.0 | 3.3 | 3.0 | 2.6 | 2.2 | 2.3 | 1.7 | 1.9 | 1.4 | 0.8 | 1.1 | 1.0 |
| CUBA | 2.0 | 2.6 | 2.4 | 1.9 | 1.3 | 1.8 | 2.3 | 2.3 | 1.4 | 0.7 | 0.5 | 0.4 | 0.4 | 0.2 | 0.2 |
| JAPAN | 18.1 | 20.0 | 20.9 | 17.4 | 7.3 | 9.1 | 9.3 | 12.0 | 20.5 | 21.0 | 32.9 | 15.1 | 24.3 | 31.6 | 22.9 |
| KOREA + PANAMA | 5.8 | 8.5 | 9.2 | 12.1 | 8.7 | 8.8 | 11.2 | 7.8 | 13.5 | 14.1 | 13.5 | 12.1 | 10.9 | 11.8 | 6.7 |
| USSR | 1.6 | 3.0 | 3.4 | 3.7 | 4.9 | 4.1 | 2.1 | 2.0 | 2.6 | 1.7 | 0.6 | 0.4 | 1.2 | 0.9 | 1.1 |
| OTHERS | 0.0 | 0.1 | 0.2 | 1.7 | 1.9 | 2.4 | 0.8 | 0.9 | 1.1 | 2.2 | 2.3 | 4.0 | 4.0 | 2.9 | 0.8 |
| -UNCL. GEARS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 2.6 |

*Juvenile Tropical Tunas Working Group estimates.
**SCRS estimates.

Table 4. Atlantic skipjack catch (1,000 MT)

| | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL | 78.2 | 78.9 | 117.8 | 61.7 | 74.7 | 110.0 | 106.2 | 88.3 | 108.8 | 129.0 | 153.0 | 133.0 | 126.4 | 118.0 | 119.7 |
| SURFACE - EAST ATLANTIC | 74.3 | 75.1 | 113.2 | 56.4 | 70.9 | 106.6 | 98.9 | 81.7 | 96.0 | 106.0 | 119.9 | 100.7 | 90.9 | 77.7 | 88.9 |
| -PURSE SEINE . . . . . | 48.7 | 49.8 | 74.2 | 35.4 | 32.5 | 55.9 | 56.7 | 35.6 | 54.0 | 64.6 | 72.3 | 63.6 | 61.7 | 47.6 | 57.3 |
| FISM . . . . . | 13.6 | 7.9 | 22.6 | 10.5 | 14.9 | 28.4 | 22.5 | 15.6 | 22.0 | 25.3 | 27.6 | 27.5 | 9.8 | 10.4 | 12.2 |
| GHANA . . . . . | 0.0 | 0.2 | 0.0 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | 0.3 | 2.7 | 3.9 | 2.8 | 3.7* | 2.9* | 1.7** |
| JAPAN . . . . . | 3.4 | 1.5 | 0.9 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.4 | 1.4 | 1.1* | 2.1* | 2.7** |
| PORTUGAL . . . . . | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.1 | 0.2 | 0.1 | 0.8 | 0.1 | 0.1 | 0.0 | 0.0 |
| ESPANA . . . . . | 19.5 | 17.8 | 30.6 | 16.9 | 15.6 | 21.5 | 24.5 | 17.4 | 24.2 | 31.3 | 34.7 | 27.6 | 44.6 | 29.4 | 38.1 |
| USA . . . . . | 12.2 | 21.2 | 20.0 | 7.4 | 1.8 | 5.9 | 6.8 | 2.1 | 2.6 | 2.8 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| OTHERS . . . . . | 0.1 | 1.2 | 0.1 | 0.3 | 0.2 | 0.1 | 2.7 | 0.4 | 4.7 | 2.4 | 3.9 | 4.1 | 2.4 | 2.9 | 2.7 |
| -BAITBOAT . . . . . | 25.3 | 25.1 | 38.9 | 16.4 | 28.7 | 42.5 | 41.4 | 44.6 | 38.1 | 38.9 | 44.5 | 34.9 | 27.8 | 29.8 | 30.0 |
| ANGOLA . . . . . | 1.5 | 1.3 | 3.4 | 0.6 | 1.5 | 3.8 | 3.2 | 3.6 | 3.5 | 2.3 | 2.2 | 0.3 | 0.0 | 0.1 | 0.1 |
| CAP VERT . . . . . | 1.5 | 1.4 | 1.3 | 1.2 | 0.8 | 0.7 | 1.3 | 1.0 | 2.1 | 1.6 | 1.6 | 1.3 | 1.0 | 2.0 | 0.9 |
| FIS . . . . . | 3.7 | 3.2 | 4.4 | 1.8 | 2.1 | 2.7 | 3.3 | 3.3 | 3.1 | 2.6 | 4.4 | 2.6 | 3.8 | 3.3 | 1.9 |
| GHANA . . . . . | 0.0 | 0.1 | 0.7 | 1.3 | 2.1 | 3.5 | 2.9 | 4.0 | 4.7 | 4.9 | 14.3 | 20.5 | 16.2* | 16.2* | 19.2** |
| JAPAN . . . . . | 10.1 | 13.0 | 18.7 | 3.7 | 15.0 | 16.8 | 14.6 | 14.7 | 12.3 | 12.9 | 8.5 | 4.6 | 0.4 | 0.0 | 0.0 |
| KOREA + PANAMA . . . | 0.7 | 1.1 | 3.1 | 6.3 | 4.4 | 7.6 | 11.1 | 13.8 | 8.5 | 7.7 | 5.4 | 3.2 | 0.7 | 0.2 | 0.0 |
| PORTUGAL . . . . . | 3.7 | 2.2 | 1.9 | 0.6 | 2.1 | 4.4 | 4.4 | 3.0 | 1.7 | 2.7 | 4.8 | 1.0 | 3.8 | 2.4 | 5.4 |
| ESPANA . . . . . | 4.1 | 2.6 | 5.4 | 0.8 | 0.6 | 0.7 | 0.6 | 1.3 | 2.2 | 4.2 | 3.4 | 1.3 | 1.9 | 5.7 | 2.5 |
| OTHERS . . . . . | 0.0 | 0.1 | 0.1 | 0.3 | 0.0 | 2.2 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| -OTHER GEARS . . . . . | 0.3 | 0.2 | 0.1 | 4.6 | 9.7 | 8.2 | 0.8 | 1.5 | 3.9 | 2.5 | 3.1 | 2.2 | 1.3 | 0.2 | 1.6 |
| SURFACE - WEST ATLANTIC | 3.7 | 3.4 | 3.9 | 4.5 | 3.7 | 3.2 | 6.6 | 6.2 | 12.7 | 22.7 | 32.2 | 31.3 | 34.8 | 40.0 | 17.9 |
| -PURSE SEINE . . . . . | 1.2 | 0.4 | 0.1 | 0.4 | 0.7 | 0.6 | 3.5 | 1.5 | 3.1 | 4.7 | 9.7 | 11.1 | 18.0 | 11.3 | 1.5 |
| BRASIL . . . . . | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.3 | 0.4 | 0.0 | 0.0 |
| ESPANA . . . . . | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.3 | 1.0 | 0.8 | 0.0 | 0.0 | 0.0 | 0.2 | 2.6 | 0.5 | 0.0 |
| USA . . . . . | 0.1 | 0.0 | 0.0 | 0.2 | 0.5 | 0.3 | 1.6 | 0.7 | 1.0 | 2.6 | 0.0 | 0.6 | 0.8 | 1.8 | 1.0 |
| VENEZUELA . . . . . | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.9 | 1.9 | 9.5 | 10.0 | 14.1 | 8.9 | 0.0 |
| OTHERS . . . . . | 0.9 | 0.4 | 0.1 | 0.1 | 0.2 | 0.0 | 0.8 | 0.0 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 | 0.1 | 0.5 |
| -BAITBOAT . . . . . | 1.4 | 1.9 | 3.0 | 2.8 | 2.8 | 2.4 | 2.8 | 4.4 | 9.4 | 18.0 | 22.4 | 20.1 | 16.8 | 28.5 | 15.7 |
| BRASIL . . . . . | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.8 | 6.1 | 13.9 | 18.2 | 15.6 | 13.1 | 25.1 | 14.4 |
| CUBA . . . . . | 1.4 | 1.5 | 1.8 | 2.3 | 2.8 | 2.4 | 1.8 | 2.0 | 2.3 | 1.1 | 1.1 | 1.7 | 1.2 | 1.6 | 1.3 |
| VENEZUELA . . . . . | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.1 | 2.7 | 2.4 | 1.8 | 0.0 |
| OTHERS . . . . . | 0.0 | 0.4 | 1.1 | 0.4 | 0.0 | 0.0 | 1.0 | 0.5 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| -OTHER GEARS . . . . . | 1.1 | 1.1 | 0.8 | 1.3 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.7 |
| SURFACE - UNCL. REGION . | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| LL+TRAWL - ALL ATLANTIC | 0.2 | 0.1 | 0.2 | 0.2 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.6 | 0.1 | 0.1 | 0.0 |
| UNCL. GEARS - ALL ATL. . | 0.1 | 0.4 | 0.5 | 0.5 | 0.2 | 0.1 | 0.6 | 0.4 | 0.1 | 0.2 | 0.9 | 0.4 | 0.7 | 0.2 | 12.9 |

*Juvenile Tropical Tunas Working Group estimates.
**Based on Abidjan sampling.

Table. 5. Skipjack CPUE (annual catch/annual fishing days) of the purse seine fleet in the east Atlantic

| YEAR | FIS MEDIUM PURSE SEINERS | FIS LARGE PURSE SEINERS | SPAIN PURSE SEINERS | FIS + SPAIN |
|---|---|---|---|---|
| 1969 | 0.76 | 0.28 | | |
| 1970 | 1.16 | 1.73 | | |
| 1971 | 1.59 | 2.27 | | |
| 1972 | 1.58 | 2.65 | | |
| 1973 | 0.87 | 1.22 | | |
| 1974 | 1.81 | 3.03 | | |
| 1975 | 1.00 | 0.91 | | |
| 1976 | 0.77 | 1.48 | | |
| 1977 | 2.20 | 3.09 | | |
| 1978 | 1.92 | 2.08 | | |
| 1979 | 1.71 | 1.37 | 2.38 | 1.75 |
| 1980 | 2.60 | 1.63 | 2.90 | 2.08 |
| 1981 | 1.92 | 1.60 | 3.99 | 2.36 |
| 1982 | 2.29 | 1.82 | 4.07 | 2.52 |
| 1983 | 2.57 | 2.00 | 2.98 | 2.22 |
| 1984 | 2.23 | 3.04 | 5.46 | 4.25 |
| 1985 | 4.10 | 3.62 | 3.05 | 3.18 |
| 1986 | 2.15 | 4.26 | 4.81 | 4.64 |

Table 6. Atlantic albacore catch (1,000 MT)

| | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL | 83.4 | 75.7 | 72.5 | 59.4 | 77.2 | 75.1 | 72.2 | 73.6 | 61.2 | 59.2 | 74.0 | 67.9 | 58.0 | 74.0 | 73.6 |
| NORTH ATLANTIC . . . . . | 49.4 | 47.0 | 52.3 | 41.4 | 57.3 | 52.9 | 48.5 | 50.3 | 38.2 | 34.1 | 42.1 | 50.9 | 39.5 | 40.4 | 40.4 |
| -SURFACE . . . . . | 34.7 | 28.8 | 37.6 | 28.7 | 34.3 | 32.0 | 34.3 | 38.1 | 28.7 | 24.3 | 28.9 | 34.3 | 19.9 | 23.3 | 23.8 |
| BAITBOAT . . . . . | 8.2 | 10.1 | 16.7 | 19.2 | 20.4 | 15.6 | 11.7 | 15.9 | 16.2 | 13.4 | 15.9 | 21.1 | 8.3 | 12.6 | 12.5 |
| FRANCE . . . . . | 0.5 | 1.1 | 0.6 | 0.7 | 1.1 | 0.6 | 0.4 | 0.2 | 0.4 | 0.4 | 0.2 | 0.2 | 0.0 | 0.1 | 0.1 |
| ESPANA . . . . . | 7.3 | 8.2 | 14.9 | 17.6 | 18.7 | 14.9 | 11.3 | 15.6 | 15.7 | 12.6 | 15.3 | 19.0 | 7.4 | 11.8 | 11.9 |
| OTHERS . . . . . | 0.4 | 0.9 | 1.2 | 0.9 | 0.6 | 0.1 | 0.1 | 0.1 | 0.1 | 0.4 | 0.4 | 2.0 | 0.9 | 0.7 | 0.4 |
| TROLLING . . . . . | 26.5 | 18.7 | 21.0 | 9.5 | 13.9 | 16.5 | 22.6 | 22.1 | 12.6 | 10.8 | 12.8 | 12.8 | 11.0 | 10.7 | 11.1 |
| FRANCE . . . . . | 8.7 | 5.8 | 7.9 | 5.0 | 5.7 | 6.2 | 8.4 | 7.8 | 3.1 | 2.5 | 2.7 | 2.2 | 2.8 | 1.8 | 1.1 |
| ESPANA . . . . . | 17.8 | 12.9 | 13.1 | 4.5 | 8.2 | 10.3 | 14.1 | 14.2 | 9.5 | 8.3 | 10.1 | 10.6 | 8.2 | 8.9 | 10.0 |
| OTHERS . . . . . | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| OTHER GEARS . . . . . | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.2 | 0.4 | 0.6 | 0.1 | 0.2 |
| -LONGLINE . . . . . | 14.7 | 18.1 | 14.6 | 12.7 | 23.0 | 20.9 | 14.2 | 12.2 | 9.4 | 9.8 | 13.2 | 16.6 | 19.5 | 17.1 | 16.7 |
| CHINA (TAIWAN) . . . | 4.4 | 9.5 | 9.5 | 8.1 | 14.8 | 13.7 | 9.3 | 7.0 | 7.1 | 6.6 | 10.5 | 14.3 | 14.9 | 14.9 | 14.8 |
| JAPAN . . . . . | 1.3 | 1.5 | 2.1 | 1.3 | 1.3 | 0.8 | 0.5 | 1.2 | 1.0 | 1.7 | 0.8 | 1.2 | 0.6 | 0.8 | 0.9 |
| KOREA + PANAMA . . . | 8.2 | 7.2 | 3.0 | 3.1 | 6.6 | 6.1 | 3.8 | 3.4 | 1.0 | 1.1 | 1.8 | 0.8 | 3.5 | 1.0 | 0.9 |
| OTHERS . . . . . | 0.8 | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.5 | 0.6 | 0.3 | 0.4 | 0.1 | 0.3 | 0.5 | 0.4 | 0.1 |
| SOUTH ATLANTIC . . . . . | 33.3 | 28.2 | 19.7 | 17.5 | 19.2 | 21.4 | 23.0 | 22.5 | 22.5 | 23.6 | 29.0 | 14.3 | 13.1 | 28.2 | 27.6 |
| -SURFACE . . . . . | 0.1 | 0.1 | 0.1 | 0.2 | 0.1 | 0.4 | 0.3 | 0.7 | 1.9 | 3.3 | 3.7 | 2.5 | 3.2 | 5.6 | 4.9 |
| FIS . . . . . | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.2 | 0.5 | 0.9 | 0.9 | 0.4 | 0.0 | 0.0 | 0.0 |
| SOUTH AFRICA . . . . | 0.1 | 0.1 | 0.1 | 0.2 | 0.0 | 0.1 | 0.1 | 0.4 | 1.2 | 1.4 | 2.5 | 1.7 | 2.6 | 5.3 | 4.7 |
| ESPANA . . . . . | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 | 0.1 | 0.3 | 0.3 | 0.2 | 0.2 |
| OTHERS . . . . . | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.1 | 0.1 | 0.3 | 0.0 | 0.2 | 0.1 | 0.3 | 0.1 | 0.0 |
| -LONGLINE . . . . . | 33.2 | 28.1 | 19.6 | 17.4 | 19.2 | 21.0 | 22.8 | 21.8 | 20.6 | 20.3 | 25.3 | 11.8 | 9.9 | 22.7 | 22.7 |
| CHINA (TAIWAN) . . . | 25.0 | 22.2 | 16.7 | 13.4 | 14.6 | 16.1 | 20.5 | 20.3 | 18.7 | 18.2 | 22.8 | 9.5 | 7.9 | 19.6 | 21.1 |
| JAPAN . . . . . | 2.1 | 0.3 | 0.1 | 0.3 | 0.1 | 0.1 | 0.1 | 0.1 | 0.3 | 0.6 | 0.6 | 0.2 | 0.2 | 0.6 | 0.7 |
| KOREA + PANAMA . . . | 5.8 | 5.6 | 2.6 | 3.5 | 4.1 | 4.1 | 1.7 | 1.0 | 0.9 | 0.8 | 0.8 | 0.6 | 0.3 | 0.5 | 0.6 |
| OTHERS . . . . . | 0.3 | 0.1 | 0.2 | 0.2 | 0.3 | 0.6 | 0.5 | 0.4 | 0.7 | 0.8 | 1.1 | 1.6 | 1.5 | 1.9 | 0.4 |

Table 6 (Cont.)

| | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MEDITERRANEAN . . . . . | 0.7 | 0.5 | 0.5 | 0.5 | 0.6 | 0.6 | 0.6 | 0.8 | 0.5 | 1.5 | 3.0 | 2.6 | 5.2 | 5.2 | 4.4 |
| FRANCE - PS . . . . | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 010 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.3 | 0.0 |
| ITALY - LL+GILL+UNCL | 0.5 | 0.5 | 0.5 | 0.5 | 0.6 | 0.6 | 0.6 | 0.8 | 0.5 | 0.6 | 0.7 | 0.7 | 2.1 | 3.3 | 3.3 |
| ESPANA - BB + TROL . | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 | 0.6 | 0.5 | 1.3 | 0.5 | 0.0 |
| OTHERS - SURF + LL . | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.7 | 1.4 | 1.6 | 1.1 | 1.1 |
| UNCL. REGION . . . . . | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| -SURFACE . . . . . | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| -LONGLINE . . . . . | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| UNCL+TRAW GEARS-ALL ATL. (EXCEPT ITALY UNCL-MEDI) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | 0.2 | 1.1 |

Table 7. Atlantic bluefin catch (MT)

| | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL | 28197 | 25473 | 20449 | 18456 | 18907 | 19142 | 23212 | 23672 | 26949 | 26003 | 19118 |
| WEST ATLANTIC | 5913 | 6710 | 5824 | 6364 | 5922 | 5912 | 1546 | 2709 | 2499 | 2759 | 1910 |
| -PURSE SEINE | 1582 | 1502 | 1230 | 1381 | 758 | 910 | 232 | 384 | 401 | 377 | 360 |
| CANADA | 332 | 298 | 241 | 0 | 0 | 105 | 0 | 0 | 0 | 0 | 0 |
| USA | 1250 | 1204 | 989 | 1381 | 758 | 805 | 232 | 384 | 401 | 377 | 360 |
| -ROD & REEL + SPORT | 590 | 630 | 475 | 499 | 535 | 523 | 308 | 476 | 401 | 466 | 328 |
| CANADA | 342 | 302 | 208 | 214 | 259 | 279 | 0 | 71 | 1 | 1 | 2 |
| USA | 248 | 328 | 267 | 285 | 276 | 244 | 308 | 405 | 400 | 465 | 326 |
| -LONGLINE | 3066 | 3752 | 3217 | 3691 | 3972 | 3879 | 349 | 828 | 835 | 1238 | 757 |
| BRAS.JPN | 0 | ++ | 14 | 10 | 2 | 3 | 1 | 1 | ++ | 1 | 0 |
| CAN.JPN. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 32 |
| CHI.TAIW | 0 | 1 | 1 | 49 | 15 | 7 | 11 | 2 | 3 | 3 | 5 |
| JAPAN | 2902 | 3658 | 3144 | 3621 | 3936 | 3771 | 292 | 711 | 696 | 1092 | 575 |
| KOREA | 7 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PANAMA | 157 | 92 | 58 | 10 | 9 | 14 | 12 | 0 | 0 | 0 | 0 |
| URUGUAY | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 9 | 10 | 6 |
| USA | 0 | 0 | 0 | 0 | 10 | 83 | 30 | 114 | 127 | 132 | 139 |
| -OTHER & UNCL. GEARS | 675 | 826 | 902 | 793 | 657 | 600 | 657 | 1021 | 862 | 678 | 465 |
| ARGENTIN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 |
| CANADA | 172 | 372 | 221 | 31 | 65 | 41 | 291 | 362 | 263 | 141 | 39 |
| DOMIN.R. | 30 | 16 | 61 | 109 | 121 | 141 | 115 | 168 | 207 | 81 | 109 |
| MEXICO | 37 | 14 | 28 | 22 | 10 | 20 | 14 | 0 | 0 | 0 | 0 |
| POLAND | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ST.LUCIA | ** | ** | ** | ** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| USA | 433 | 424 | 592 | 631 | 461 | 398 | 237 | 491 | 392 | 450 | 317 |

Table 7 (Cont.)

| | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EAST ATLANTIC . . . . . | 5212 | 6977 | 5800 | 4767 | 4064 | 3331 | 6669 | 8010 | 7386 | 4754 | 4210 |
| -BAITBOAT . . . . . | 1803 | 2881 | 3904 | 2128 | 1874 | 1553 | 957 | 3032 | 2948 | 2366 | 2253 |
| CAP VERT . . . . . | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 1 | 0 | 0 |
| FRANCE . . . . . | 267 | 592 | 723 | 275 | 260 | 153 | 150 | 400 | 566 | 380 | 272 |
| PORTUGAL . . . . . | 24 | 14 | 56 | 10 | 17 | 16 | 30 | 53 | 15 | 3 | 28 |
| ESPANA . . . . . | 1512 | 2275 | 3125 | 1843 | 1597 | 1384 | 777 | 2569 | 2366 | 1983 | 1953 |
| -PURSE SEINE . . . . . | 860 | 1426 | 257 | 266 | 437 | 266 | 655 | 262 | 414 | 86 | 281 |
| MAROC . . . . . | 331 | 662 | 36 | 206 | 155 | 105 | 600 | 187 | 127 | 86 | 122 |
| NORWAY . . . . . | 529 | 764 | 221 | 60 | 282 | 161 | 50 | 1 | 243 | 0 | 24 |
| PORTUGAL . . . . . | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 74 | 3 | 0 | 123 |
| ESPANA . . . . . | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 41 | 0 | 12 |
| USA . . . . . | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 |
| -TRAP . . . . . | 490 | 561 | 450 | 600 | 706 | 859 | 2309 | 1956 | 2271 | 1630 | 799 |
| MAROC . . . . . | 0 | 222 | 0 | 0 | 6 | 72 | 393 | 94 | 0 | 0 | 0 |
| ESPANA . . . . . | 490 | 339 | 450 | 600 | 700 | 787 | 1916 | 1862 | 2271 | 1630 | 799 |
| -LONGLINE . . . . . | 2048 | 1806 | 733 | 748 | 1002 | 575 | 2705 | 2626 | 1538 | 535 | 765 |
| CHI.TAIW . . . . . | 3 | 2 | 0 | 3 | 5 | 6 | 16 | 2 | 0 | 0 | 22 |
| JAPAN . . . . . | 1973 | 1594 | 577 | 630 | 880 | 515 | 2573 | 2609 | 1514 | 420 | 712 |
| KOREA . . . . . | 3 | 2 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 77 | 0 |
| PANAMA . . . . . | 69 | 208 | 156 | 14 | 117 | 48 | 12 | 0 | 17 | 22 | 11 |
| ESPANA . . . . . | 0 | 0 | 0 | 100 | 0 | 6 | 104 | 12 | 7 | 16 | 20 |
| -OTHER & UNCL. GEARS . . . | 11 | 303 | 456 | 1025 | 45 | 78 | 43 | 134 | 215 | 137 | 112 |
| DENMARK . . . . . | 3 | 1 | 3 | 1 | 0 | 4 | ++ | ++ | 0 | 0 | 1 |
| FRANCE . . . . . | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 110 | 76 |
| GER.F.R. . . . . | 0 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| GREECE . . . . . | 0 | 0 | 0 | 0 | 0 | ++ | 5 | 0 | 0 | 0 | 0 |
| MAROC . . . . . | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 84 | 44 | 0 | 0 |
| NETHERLA . . . . . | 0 | 0 | 0 | 0 | 0 | 0 | ++ | ++ | ++ | ++ | ++ |
| NORWAY . . . . . | 0 | 0 | 0 | 0 | 0 | ++ | 0 | 0 | 0 | 0 | 0 |
| PORTUGAL . . . . . | 0 | 0 | 0 | 25 | 7 | 1 | 11 | 47 | 16 | 26 | 35 |
| ESPANA . . . . . | 0 | 300 | 450 | 998 | 38 | 70 | 27 | 2 | 119 | 1 | 0 |
| SWEDEN . . . . . | 8 | 2 | 2 | ++ | ++ | 1 | ++ | 1 | ++ | 0 | 0 |

Table 7 (Cont.)

| | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MEDITERRANEAN . . . . . | 17072 | 11786 | 8825 | 7325 | 8921 | 9899 | 14997 | 12953 | 17064 | 18490 | 12998 |
| -PURSE SEINE . . . . . | 13970 | 9552 | 7278 | 5990 | 7394 | 7430 | 11023 | 9370 | 9856 | 10988 | 7528 |
| FRANCE . . . . . | 3800 | 3182 | 1566 | 1527 | 1701 | 2300 | 4818 | 3600 | 3570 | 5400 | 3460 |
| ITALY . . . . . | 9607 | 5431 | 4663 | 3705 | 5120 | 4704 | 5442 | 4552 | 5382 | 4522 | 3289 |
| MAROC . . . . . | 1 | 7 | 0 | 2 | ++ | 2 | ++ | 0 | 0 | 0 | 0 |
| ESPANA . . . . . | 0 | 0 | 0 | 0 | 0 | 50 | 277 | 0 | 79 | 56 | 22 |
| YUGOSLAV . . . . . | 562 | 932 | 1049 | 756 | 573 | 374 | 486 | 1218 | 825 | 1010 | 757 |
| -TRAP . . . . . | 718 | 820 | 331 | 326 | 611 | 565 | 451 | 401 | 1028 | 677 | 547 |
| ITALY . . . . . | 650 | 698 | 210 | 195 | 152 | 209 | 155 | 284 | 327 | 295 | 295 |
| LIBYA . . . . . | 0 | 0 | 0 | 0 | 339 | 255 | 130 | 0 | 0 | 0 | 0 |
| ESPANA . . . . . | 3 | 2 | 1 | 0 | 0 | 3 | 66 | 37 | 621 | 302 | 168 |
| TUNISIE . . . . . | 65 | 120 | 120 | 131 | 120 | 98 | 100 | 80 | 80 | 80 | 84 |
| -LONGLINE . . . . . | 1218 | 592 | 153 | 199 | 219 | 300 | 1499 | 939 | 1146 | 1064 | 507 |
| ITALY . . . . . | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 41 | 62 | 62 |
| JAPAN . . . . . | 968 | 520 | 61 | 99 | 119 | 100 | 961 | 677 | 1036 | 873 | 328 |
| PANAMA . . . . . | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ESPANA . . . . . | 250 | 68 | 92 | 100 | 100 | 200 | 538 | 233 | 69 | 129 | 117 |
| -OTHER & UNCL. GEARS . . . | 1166 | 822 | 1063 | 810 | 697 | 1604 | 2024 | 2243 | 5034 | 5761 | 4416 |
| ALGERIE . . . . . | 49 | 40 | 20 | 150 | 190 | 220 | 250 | 252 | 254 | 260 | 280 |
| FRANCE . . . . . | 0 | 0 | 31 | 51 | 0 | 50 | 60 | 60 | 30 | 30 | 30 |
| GREECE . . . . . | 0 | 0 | 0 | 0 | 0 | 516 | 500 | 500 | 500 | 500 | 500 |
| ITALY . . . . . | 112 | 134 | 110 | 120 | 0 | 104 | 61 | 0 | 1082 | 1424 | 1474 |
| LIBYA . . . . . | 799 | 336 | 677 | 424 | 59 | 16 | 180 | 300 | 300 | 300 | 300 |
| MALTA . . . . . | 25 | 47 | 26 | 23 | 24 | 32 | 40 | 31 | 21 | 21 | 41 |
| MAROC . . . . . | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 12 | 18 |
| ESPANA . . . . . | 0 | 88 | 72 | 15 | 33 | 101 | 108 | 542 | 1974 | 984 | 249 |
| TURKEY . . . . . | 181 | 177 | 127 | 27 | 391 | 565 | 825 | 557 | 869 | 2230 | 1524 |

++ - Catch less than 0.5 MT.
** - Unknown catch.

Table 8. The percent composition of small fish less than 6.4 kg for the east Atlantic and Mediterranean and small fish less than 120 cm for the west Atlantic

| Year | East Atlantic | Mediterranean | East Atlantic & Mediterranean | West Atlantic | |
|---|---|---|---|---|---|
| | < 6.4 kg as % by numbers | | | <6.4 kg % nos. | <120 cm % weight |
| 1974 | -- | -- | -- | 45.7 | 15.5 |
| 1975 | -- | -- | -- | 19.6 | 35.1 |
| 1976 | 45.9 | 17.7 | 23.9 | 4.5 | 26.3 |
| 1977 | 51.3 | 51.6 | 51.5 | 1.7 | 12.5 |
| 1978 | 50.6 | 38.9 | 42.8 | 7.6 | 11.4 |
| 1979 | 48.7 | 25.6 | 35.0 | 4.0 | 9.1 |
| 1980 | 57.0 | 20.7 | 33.2 | 4.6 | 8.8 |
| 1981 | 63.1 | 11.8 | 26.1 | 7.0 | 9.5 |
| 1982 | 67.4 | 28.9 | 37.1 | 22.4 | 6.3 |
| 1983 | 75.2 | 59.0 | 64.9 | 17.7 | 4.1 |
| 1984 | 16.7 | 17.5 | 17.3 | 4.1 | 5.9 |
| 1985 | 20.8 | 59.8 | 54.6 | 1.6 | 10.4 |
| 1986 | -- | -- | -- | 3.1 | 11.4 |

Table 9. Nominal catch at age for the east Atlantic and Mediterranean Sea estimated from the Farrugio growth equation ($L_{oo}$ = 351 cm, k = 0.080, $t_o$ = -1.087)

| | Catch in Number | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 |
| 0 | 52911 | 190066 | 40228 | 99011 | 144821 | 183316 | 101280 | 260321 | 194243 | 57425 | 589636 | 29723 | 80809 | 351081 | 1688 | 369192 |
| 1 | 130772 | 10423 | 115725 | 138102 | 181757 | 685791 | 93610 | 214061 | 147854 | 74075 | 110511 | 148702 | 686475 | 682509 | 228294 | 572333 |
| 2 | 76626 | 88641 | 148570 | 66881 | 130102 | 289266 | 188083 | 287032 | 195233 | 40217 | 152516 | 319670 | 195261 | 155903 | 590218 | 305695 |
| 3 | 26359 | 52434 | 73295 | 83398 | 56415 | 34088 | 279697 | 43050 | 149970 | 101630 | 99926 | 94453 | 188618 | 114743 | 41959 | 296477 |
| 4 | 16746 | 15130 | 15235 | 6434 | 63235 | 19638 | 40803 | 66156 | 28978 | 48658 | 27918 | 12747 | 23223 | 28737 | 32486 | 32613 |
| 5 | 9570 | 12223 | 7466 | 3184 | 7470 | 6728 | 20323 | 2254 | 4905 | 6944 | 8620 | 12428 | 5229 | 10506 | 21553 | 13663 |
| 6 | 8929 | 4146 | 8017 | 3600 | 5119 | 4732 | 5376 | 5396 | 1775 | 2647 | 5399 | 7120 | 3693 | 3618 | 10375 | 7590 |
| 7 | 4625 | 4563 | 4308 | 6822 | 3042 | 3323 | 3371 | 4214 | 2652 | 2592 | 3186 | 4235 | 6286 | 9358 | 6729 | 3835 |
| 8 | 3723 | 12279 | 2455 | 10255 | 5379 | 3449 | 1999 | 2476 | 1768 | 3764 | 2217 | 4896 | 8605 | 5877 | 7500 | 3028 |
| 9 | 6428 | 3174 | 3249 | 6560 | 10663 | 5766 | 3965 | 2705 | 1320 | 3954 | 2541 | 3852 | 5714 | 5718 | 11439 | 3284 |
| 10 | 8615 | 1905 | 1162 | 1598 | 4600 | 5763 | 3059 | 3580 | 3485 | 3501 | 3885 | 3731 | 6197 | 13916 | 11541 | 5783 |
| 11 | 5098 | 1428 | 1305 | 1828 | 4700 | 7269 | 4079 | 3827 | 2018 | 2321 | 3997 | 4628 | 7257 | 5872 | 8736 | 5766 |
| 12 | 2555 | 1529 | 1928 | 1862 | 6115 | 10373 | 5326 | 4500 | 3012 | 2129 | 3984 | 3777 | 8250 | 6247 | 9735 | 5866 |
| 13 | 809 | 1101 | 2959 | 2677 | 7133 | 10269 | 7951 | 5131 | 3598 | 3637 | 3911 | 2202 | 10315 | 6157 | 4637 | 4142 |
| 14 | 2758 | 1832 | 1492 | 3231 | 6859 | 8214 | 6740 | 6240 | 5935 | 3246 | 3347 | 1502 | 3003 | 4247 | 2760 | 2249 |
| 15 | 2258 | 3837 | 1688 | 1044 | 4242 | 5122 | 4870 | 4992 | 3563 | 2206 | 2699 | 1081 | 1410 | 1048 | 1404 | 1284 |
| 16 | 1411 | 3442 | 2824 | 1167 | 1329 | 3525 | 3154 | 3299 | 1577 | 2406 | 1537 | 693 | 1086 | 441 | 919 | 663 |
| 17 | 537 | 1700 | 1262 | 1712 | 977 | 985 | 1757 | 1948 | 836 | 1454 | 566 | 429 | 881 | 239 | 545 | 323 |
| 18 | 119 | 746 | 528 | 767 | 1475 | 829 | 640 | 1242 | 823 | 836 | 192 | 330 | 424 | 115 | 202 | 137 |
| 19 | 20 | 240 | 129 | 184 | 604 | 797 | 426 | 163 | 502 | 164 | 48 | 116 | 160 | 81 | 114 | 65 |
| 20 | 3 | 40 | 25 | 58 | 107 | 240 | 364 | 245 | 24 | 56 | 5 | 67 | 73 | 4 | 67 | 40 |
| 21 | 0 | 0 | 0 | 5 | 25 | 118 | 122 | 194 | 38 | 16 | 1 | 15 | 15 | 2 | 12 | 27 |
| 22 | 0 | 0 | 0 | 0 | 12 | 67 | 97 | 127 | 290 | 11 | 0 | 0 | 6 | 0 | 0 | 5 |
| 23 | 0 | 0 | 6 | 6 | 13 | 57 | 115 | 138 | 14 | 25 | 0 | 2 | 3 | 0 | 1 | 5 |
| 24 | 0 | 0 | 0 | 0 | 4 | 8 | 19 | 19 | 1 | 15 | 2 | 0 | 0 | 0 | 0 | 0 |
| 25 | 0 | 0 | 0 | 0 | 4 | 11 | 41 | 55 | 146 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26 | 0 | 0 | 0 | 0 | 0 | 2 | 33 | 37 | 112 | 2 | 0 | 0 | 0 | 0 | 0 | 2 |
| 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 |
| 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 |
| 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 30 | 0 | 0 | 0 | 0 | 3 | 0 | 4 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 |
| TOTAL | 360872 | 410877 | 433867 | 440385 | 646205 | 1289745 | 777303 | 923400 | 754681 | 363937 | 496641 | 656402 | 1242993 | 1406420 | 992915 | 1634072 |

Table 10. Nominal catch at age for the west Atlantic estimated from the Parrack and Phares growth equation

| | Catch in Number | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
| 0 | 117 | 0 | 0 | 3 | 28 | 61 | 54 | 46 | 65 | 20 | 249 | 26 | 24 | 0 | 30 | 10 | 40 |
| 1 | 71408 | 64907 | 45772 | 5460 | 55914 | 44489 | 5427 | 1342 | 5725 | 3007 | 3539 | 6269 | 3702 | 4114 | 917 | 563 | 583 |
| 2 | 124014 | 151538 | 97975 | 73811 | 19080 | 146899 | 19629 | 22493 | 10197 | 10539 | 18464 | 10209 | 3651 | 2583 | 7164 | 5689 | 5548 |
| 3 | 101254 | 38025 | 33329 | 28705 | 22228 | 4164 | 70609 | 7394 | 17839 | 14245 | 7850 | 15481 | 1536 | 3040 | 2001 | 11854 | 7021 |
| 4 | 15635 | 45142 | 2711 | 5486 | 4224 | 14311 | 3368 | 21695 | 5557 | 7844 | 6895 | 4858 | 477 | 889 | 1684 | 2460 | 2841 |
| 5 | 8772 | 1476 | 3407 | 4481 | 4489 | 2167 | 2886 | 15250 | 7758 | 11596 | 4778 | 5188 | 235 | 670 | 2021 | 3883 | 1877 |
| 6 | 1802 | 850 | 2163 | 2395 | 1983 | 814 | 1653 | 3008 | 7527 | 1541 | 1534 | 3634 | 404 | 739 | 1600 | 3853 | 1325 |
| 7 | 607 | 1463 | 91 | 622 | 592 | 370 | 252 | 3014 | 2522 | 2832 | 1993 | 2570 | 511 | 620 | 746 | 1768 | 1323 |
| 8 | 109 | 1515 | 432 | 562 | 899 | 235 | 142 | 884 | 445 | 2322 | 4098 | 2044 | 417 | 995 | 455 | 670 | 966 |
| 9 | 88 | 1430 | 416 | 1317 | 476 | 390 | 644 | 269 | 459 | 766 | 4267 | 2095 | 302 | 967 | 506 | 419 | 506 |
| 10 | 256 | 1029 | 344 | 1085 | 787 | 698 | 691 | 397 | 320 | 425 | 1291 | 2603 | 487 | 853 | 629 | 434 | 567 |
| 11 | 429 | 964 | 175 | 349 | 901 | 1327 | 473 | 532 | 194 | 389 | 839 | 1728 | 754 | 708 | 768 | 455 | 456 |
| 12 | 428 | 831 | 388 | 487 | 521 | 950 | 753 | 620 | 362 | 448 | 635 | 1296 | 702 | 651 | 689 | 498 | 385 |
| 13 | 566 | 1056 | 727 | 682 | 681 | 841 | 1318 | 625 | 417 | 665 | 567 | 935 | 671 | 809 | 867 | 704 | 564 |
| 14 | 700 | 1089 | 961 | 744 | 1890 | 1392 | 2074 | 977 | 647 | 1125 | 688 | 749 | 320 | 930 | 703 | 847 | 585 |
| 15 | 558 | 918 | 963 | 545 | 1614 | 1487 | 2623 | 1604 | 1140 | 1563 | 1099 | 671 | 178 | 670 | 917 | 953 | 819 |
| 16 | 391 | 1016 | 758 | 618 | 1548 | 1582 | 2277 | 1946 | 1224 | 1698 | 1712 | 985 | 119 | 398 | 531 | 891 | 663 |
| 17 | 297 | 516 | 574 | 500 | 1528 | 910 | 1436 | 1859 | 1628 | 1499 | 1515 | 799 | 176 | 415 | 281 | 580 | 414 |
| 18 | 160 | 337 | 468 | 486 | 2530 | 978 | 1169 | 1860 | 1966 | 1595 | 1661 | 686 | 149 | 577 | 266 | 348 | 345 |
| 19 | 145 | 225 | 333 | 311 | 774 | 530 | 786 | 1014 | 1305 | 934 | 1505 | 715 | 175 | 399 | 219 | 211 | 193 |
| 20 | 104 | 81 | 142 | 159 | 700 | 394 | 709 | 855 | 1031 | 926 | 941 | 778 | 226 | 404 | 182 | 137 | 136 |
| 21 | 22 | 48 | 144 | 68 | 616 | 237 | 439 | 614 | 725 | 646 | 798 | 777 | 162 | 209 | 98 | 91 | 26 |
| 22 | 24 | 36 | 60 | 51 | 338 | 116 | 211 | 352 | 526 | 461 | 421 | 649 | 176 | 231 | 116 | 77 | 103 |
| 23 | 25 | 7 | 20 | 20 | 42 | 112 | 163 | 273 | 360 | 381 | 318 | 557 | 133 | 222 | 166 | 98 | 31 |
| 24 | 15 | 4 | 12 | 10 | 15 | 36 | 73 | 96 | 262 | 192 | 220 | 282 | 73 | 116 | 56 | 57 | 39 |
| 25 | 15 | 2 | 4 | 6 | 7 | 31 | 32 | 74 | 167 | 152 | 164 | 314 | 45 | 83 | 82 | 44 | 41 |
| 26 | 15 | 0 | 1 | 0 | 8 | 22 | 19 | 41 | 104 | 111 | 109 | 227 | 28 | 78 | 45 | 41 | 30 |
| 27 | 10 | 1 | 3 | 0 | 6 | 17 | 15 | 40 | 86 | 97 | 118 | 192 | 41 | 40 | 26 | 30 | 19 |
| 28 | 0 | 3 | 1 | 0 | 2 | 5 | 16 | 24 | 68 | 30 | 41 | 96 | 24 | 23 | 33 | 18 | 19 |
| 29 | 0 | 3 | 0 | 0 | 0 | 1 | 3 | 7 | 33 | 16 | 25 | 79 | 42 | 16 | 27 | 15 | 16 |
| 30 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 4 | 33 | 18 | 13 | 88 | 7 | 5 | 9 | 5 | 1 |
| TOTAL | 327967 | 314512 | 192371 | 128962 | 124424 | 225566 | 119943 | 89213 | 70691 | 68081 | 68347 | 67583 | 15946 | 22450 | 23833 | 37704 | 27479 |

Table 11. Estimated stock size (in number of fish) for west Atlantic bluefin tuna

| AGE | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 311414 | 281220 | 130791 | 436878 | 142089 | 105500 | 71680 | 54405 | 75019 | 48941 | 39228 | 31868 | 54490 | 69716 | 58082 | 17367 | 0 | 0 |
| 1 | 349128 | 281663 | 254458 | 118345 | 395301 | 128540 | 95403 | 64808 | 49184 | 67818 | 44265 | 35258 | 28811 | 49282 | 63082 | 52526 | 16157 | 0 |
| 2 | 216103 | 248141 | 193287 | 186797 | 101893 | 304589 | 74164 | 81166 | 57365 | 39066 | 58506 | 36690 | 25952 | 22554 | 40683 | 56207 | 46992 | 14066 |
| 3 | 136315 | 78501 | 81626 | 82312 | 99148 | 74088 | 136732 | 48493 | 52116 | 42226 | 25355 | 35441 | 23519 | 20015 | 17954 | 30012 | 45454 | 37251 |
| 4 | 42261 | 73419 | 35085 | 42314 | 47288 | 68624 | 63080 | 57010 | 36858 | 30257 | 24712 | 15502 | 17422 | 19821 | 15224 | 14345 | 15934 | 34463 |
| 5 | 30765 | 23433 | 23867 | 29170 | 33077 | 38775 | 48514 | 53876 | 31043 | 28074 | 19939 | 15823 | 9423 | 15311 | 17090 | 12176 | 10644 | 11721 |
| 6 | 32450 | 19522 | 19800 | 18360 | 22140 | 25667 | 33026 | 41155 | 34291 | 20731 | 14428 | 13509 | 9402 | 8303 | 13217 | 13544 | 7338 | 7850 |
| 7 | 29746 | 27650 | 16856 | 15861 | 14339 | 18149 | 22450 | 28312 | 34380 | 23886 | 17294 | 11598 | 8777 | 8123 | 6811 | 10440 | 8603 | 5382 |
| 8 | 30075 | 26338 | 23628 | 15165 | 13761 | 12412 | 16070 | 20074 | 22755 | 28712 | 18924 | 13755 | 8056 | 7457 | 6761 | 5454 | 7768 | 6528 |
| 9 | 33444 | 27110 | 22392 | 20969 | 13188 | 11597 | 11007 | 14406 | 17324 | 20166 | 23773 | 13234 | 10505 | 6893 | 5802 | 5685 | 4299 | 6111 |
| 10 | 31842 | 30178 | 23171 | 19866 | 17722 | 11481 | 10123 | 9348 | 12779 | 15239 | 17519 | 17461 | 9986 | 9218 | 5319 | 4769 | 4746 | 3409 |
| 11 | 27262 | 28569 | 26323 | 20639 | 16944 | 15287 | 9725 | 8503 | 8081 | 11259 | 13385 | 14625 | 13328 | 8573 | 7531 | 4215 | 3903 | 3756 |
| 12 | 20709 | 24260 | 24934 | 23656 | 18343 | 14475 | 12572 | 8350 | 7188 | 7127 | 9818 | 11314 | 11592 | 11343 | 7084 | 6085 | 3382 | 3098 |
| 13 | 17299 | 18332 | 21162 | 22192 | 20942 | 16102 | 12195 | 10660 | 6966 | 6160 | 6023 | 8280 | 9006 | 9822 | 9645 | 5756 | 5032 | 2694 |
| 14 | 15320 | 15115 | 15584 | 18457 | 19432 | 18302 | 13771 | 9783 | 9052 | 5907 | 4942 | 4911 | 6604 | 7511 | 8119 | 7903 | 4539 | 4018 |
| 15 | 9624 | 13197 | 12641 | 13188 | 15993 | 15787 | 15237 | 10491 | 7923 | 7575 | 4277 | 3819 | 3733 | 5671 | 5913 | 6678 | 6347 | 3552 |
| 16 | 6745 | 8178 | 11069 | 10523 | 11415 | 12938 | 12872 | 11297 | 7970 | 6087 | 5371 | 2828 | 2818 | 3209 | 4495 | 4480 | 5138 | 4965 |
| 17 | 4559 | 5732 | 6435 | 9295 | 8935 | 8858 | 10204 | 9486 | 8375 | 6049 | 3898 | 3238 | 1626 | 2437 | 2525 | 3563 | 3208 | 4019 |
| 18 | 2695 | 3843 | 4696 | 5277 | 7936 | 6634 | 7151 | 7870 | 6819 | 6033 | 4052 | 2093 | 2172 | 1304 | 1811 | 2018 | 2673 | 2510 |
| 19 | 1697 | 2286 | 3157 | 3804 | 4313 | 4783 | 5074 | 5361 | 5356 | 4306 | 3946 | 2094 | 1243 | 1824 | 634 | 1386 | 1496 | 2091 |
| 20 | 785 | 1398 | 1855 | 2540 | 3147 | 3168 | 3824 | 3845 | 3888 | 3609 | 3010 | 2146 | 1217 | 959 | 1271 | 366 | 1054 | 1170 |
| 21 | 490 | 611 | 1188 | 1544 | 2148 | 2183 | 2492 | 2787 | 2668 | 2540 | 2387 | 1832 | 1205 | 887 | 485 | 978 | 201 | 824 |
| 22 | 423 | 422 | 508 | 938 | 1332 | 1359 | 1750 | 1839 | 1940 | 1727 | 1686 | 1404 | 922 | 936 | 604 | 346 | 798 | 158 |
| 23 | 107 | 365 | 348 | 402 | 800 | 885 | 1120 | 1383 | 1329 | 1256 | 1125 | 1126 | 657 | 668 | 628 | 437 | 240 | 624 |
| 24 | 38 | 74 | 323 | 296 | 345 | 684 | 694 | 858 | 993 | 862 | 776 | 717 | 493 | 468 | 394 | 411 | 302 | 188 |
| 25 | 35 | 20 | 63 | 281 | 258 | 298 | 585 | 559 | 685 | 650 | 597 | 493 | 381 | 376 | 313 | 303 | 318 | 236 |
| 26 | 30 | 17 | 16 | 53 | 249 | 227 | 240 | 499 | 435 | 462 | 444 | 385 | 150 | 302 | 262 | 206 | 232 | 249 |
| 27 | 56 | 13 | 16 | 14 | 48 | 217 | 184 | 199 | 412 | 295 | 313 | 298 | 134 | 109 | 200 | 194 | 147 | 182 |
| 28 | 45 | 41 | 11 | 11 | 12 | 38 | 180 | 153 | 142 | 291 | 175 | 171 | 89 | 83 | 61 | 156 | 147 | 115 |
| 29 | 15 | 41 | 34 | 9 | 10 | 9 | 29 | 148 | 115 | 64 | 235 | 120 | 64 | 58 | 53 | 24 | 124 | 115 |
| 30 | 0 | 14 | 34 | 31 | 8 | 9 | 8 | 24 | 127 | 73 | 43 | 189 | 34 | 19 | 37 | 22 | 8 | 97 |
| TOTAL | 1401984 | 1239705 | 955362 | 1119188 | 1032554 | 921666 | 692157 | 567145 | 503578 | 437450 | 370446 | 302222 | 263813 | 293252 | 302092 | 268552 | 207225 | 161442 |

Table 12. Atlantic blue marlin catch (MT)

| COUNTRY | GEAR | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 |
|---|---|---|---|---|---|---|---|
| TOTAL | | 2858 | 3197 | 2373 | 3180 | 2832 | 3030 |
| NORTH ATL | | 1839 | 2111 | 1313 | 1615 | 1731 | 1924 |
| CHI.TAIW | LLFB | 369 | 158 | 300 | 155 | 183 | 105 |
| CUBA | LL | 108 | 149 | 67 | 223 | 516 | 594 |
| JAPAN | LL | 758 | 1223 | 335 | 229 | 0 | 0 |
| JAPAN | LLHB | 0 | 0 | 0 | 0 | 267 | 551 |
| KOREA | LLFB | 368 | 221 | 215 | 457 | 385 | 304 |
| PANAMA | LLFB | ** | ** | 10 | 208 | 62 | 44 |
| USA | SPOR | 204 | 179 | 191 | 209 | 234 | 241 |
| USSR | LLMB | 2 | 3 | 7 | 10 | 1 | 3 |
| VENEZUEL | LL | 30 | 178 | 188 | 124 | 83 | 82 |
| SOUTH ATL | | 1019 | 1086 | 1060 | 1565 | 1101 | 1106 |
| BRASIL | LLHB | 38 | 21 | 26 | 8 | 16 | 12 |
| BRASIL | SPOR | 1 | 0 | 0 | 0 | 0 | 0 |
| CHI.TAIW | LLFB | 560 | 604 | 628 | 537 | 369 | 422 |
| CUBA | LL | 41 | 17 | 22 | 75 | 170 | 195 |
| JAPAN | LL | 247 | 172 | 85 | 117 | 0 | 0 |
| JAPAN | LLHB | 0 | 0 | 0 | 0 | 17 | 57 |
| KOREA | LLFB | 120 | 258 | 251 | 532 | 449 | 354 |
| PANAMA | LLFB | ** | ** | 12 | 244 | 72 | 51 |
| USSR | LLMB | 12 | 14 | 36 | 52 | 8 | 15 |

| COUNTRY | GEAR | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL | | 2191 | 2086 | 1372 | 1278 | 1486 | 1725 | 2583 | 1599 | 2086 | 2572 | 1518 |
| NORTH ATL | | 1243 | 1171 | 848 | 775 | 935 | 1082 | 1470 | 958 | 1091 | 1297 | 903 |
| BENIN | GILL | 0 | 0 | 0 | 0 | 0 | 5 | 7 | 0 | 8 | 10 | 7 |
| BENIN | HS | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 |
| CHI.TAIW | LLFB | 169 | 64 | 81 | 51 | 160 | 98 | 100 | 106 | 74 | 81 | 87 |
| CUBA | LL | 250 | 220 | 97 | 156 | 162 | 178 | 318 | 273 | 214 | 246 | 79 |
| GRENADA | UNCL | 0 | ** | ** | ** | 1 | 1 | 12 | 6 | 8 | 11 | 36 |
| JAPAN | LLHB | 260 | 118 | 54 | 68 | 193 | 332 | 637 | 192 | 351 | 409 | 186 |
| KOREA | LLFB | 174 | 307 | 185 | 67 | 45 | 70 | 18 | 25 | 137 | 147 | 25 |
| PANAMA | LLFB | 47 | 87 | 42 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PORTUGAL | SPOR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 11 |
| PORTUGAL | BB | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 0 |
| PORTUGAL | HAND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| ESPANA | LLHB | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 4 | 1 |
| USA | LL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 61 |
| USA | SPOR | 265 | 295 | 295 | 295 | 295 | 295 | 295 | 187 | 187 | 147 | 187 |
| USA | HAND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ++ | 1 |
| USSR | LLMB | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| VENEZUEL | LL | 78 | 79 | 93 | 132 | 79 | 102 | 81 | 167 | 107 | 214 | 214 |
| SOUTH ATL | | 948 | 915 | 524 | 503 | 551 | 430 | 832 | 496 | 945 | 1275 | 609 |
| BRASIL | LLHB | 22 | 0 | 12 | 14 | 12 | 0 | 1 | 1 | 11 | 0 | 0 |
| BRASIL | SURF | 11 | 52 | 2 | 15 | 7 | 20 | 20 | 3 | 1 | 0 | 0 |
| BRASIL | SPOR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| BRAS.JPN | LLFB | 0 | 136 | 29 | 4 | 8 | 5 | 15 | 15 | 20 | 25 | 25 |
| BRAS.KOR | LLFB | 12 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| CHI.TAIW | LLFB | 240 | 107 | 177 | 139 | 129 | 104 | 150 | 39 | 50 | 98 | 71 |
| C.IVOIRE | SURF | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ** | ** | ** |
| CUBA | LL | 159 | 100 | 113 | 180 | 187 | 108 | 118 | 123 | 159 | 205 | 135 |
| JAPAN | LLHB | 4 | 17 | 15 | 66 | 115 | 136 | 495 | 248 | 482 | 691 | 319 |
| KOREA | LLFB | 392 | 356 | 140 | 78 | 92 | 56 | 33 | 67 | 221 | 248 | 42 |
| PANAMA | LLFB | 107 | 103 | 32 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S.AFRICA | LLHB | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| USSR | LLMB | 1 | 9 | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 7 | 16 |
| UNCL. REGION | | 0 | 0 | 0 | 0 | 0 | 213 | 281 | 145 | 50 | 0 | 6 |
| CHI.TAIW | LLFB | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| FRANCE | PS | 0 | 0 | 0 | 0 | 0 | 150 | 180 | 100 | 50 | 0 | 0 |
| ESPANA | PS | 0 | 0 | 0 | 0 | 0 | 63 | 101 | 45 | 0 | 0 | 0 |

++ - Catch less than 0.5 MT
** - Unknown catch
Note: Slight change in figures for recent years since SCRS adapted table to updated data.

Table 13. Atlantic white marlin catch (MT)

| COUNTRY | GEAR | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 |
|---|---|---|---|---|---|---|---|
| TOTAL | | 2085 | 2246 | 2331 | 1779 | 1747 | 1572 |
| NORTH ATL | | 1036 | 1535 | 1198 | 990 | 1211 | 1084 |
| CHI.TAIW | LLFB | 97 | 178 | 244 | 120 | 248 | 84 |
| CUBA | LL | 61 | 45 | 34 | 112 | 256 | 294 |
| JAPAN | LL | 419 | 915 | 339 | 328 | 0 | 0 |
| JAPAN | LLHB | 0 | 0 | 0 | 0 | 381 | 404 |
| KOREA | LLFB | 340 | 219 | 213 | 106 | 90 | 71 |
| PANAMA | LLFB | ** | ** | 10 | 48 | 14 | 10 |
| USA | SPOR | 104 | 95 | 99 | 104 | 108 | 107 |
| USSR | LLMB | 0 | 1 | 1 | 2 | 0 | 1 |
| VENEZUEL | LL | 15 | 82 | 258 | 170 | 114 | 113 |
| SOUTH ATL | | 1049 | 711 | 1133 | 789 | 536 | 488 |
| ARGENTIN | LL | 0 | 20 | 100 | 57 | ++ | 2 |
| BRASIL | LLHB | 54 | 15 | 94 | 10 | 36 | 31 |
| BRASIL | SPOR | ++ | 0 | 0 | 0 | 0 | 0 |
| CHI.TAIW | LLFB | 469 | 260 | 469 | 412 | 279 | 255 |
| CUBA | LL | 8 | 4 | 6 | 21 | 48 | 55 |
| JAPAN | LL | 284 | 65 | 101 | 27 | 0 | 0 |
| JAPAN | LLHB | 0 | 0 | 0 | 0 | 9 | 14 |
| KOREA | LLFB | 230 | 341 | 332 | 165 | 139 | 109 |
| PANAMA | LLFB | ** | ** | 16 | 75 | 22 | 16 |
| USSR | LLMB | 4 | 6 | 15 | 22 | 3 | 6 |

| COUNTRY | GEAR | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL | | 1812 | 977 | 937 | 1012 | 955 | 1130 | 1091 | 1672 | 1100 | 1550 | 1383 |
| NORTH ATL | | 1047 | 499 | 426 | 479 | 505 | 778 | 652 | 1377 | 704 | 891 | 810 |
| CHI.TAIW | LLFB | 142 | 44 | 79 | 62 | 105 | 174 | 130 | 203 | 52 | 115 | 275 |
| CUBA | LL | 68 | 67 | 43 | 68 | 70 | 189 | 205 | 728 | 241 | 296 | 183 |
| JAPAN | LLHB | 540 | 80 | 27 | 42 | 99 | 118 | 84 | 27 | 52 | 45 | 51 |
| KOREA | LLFB | 64 | 71 | 33 | 16 | 12 | 48 | 12 | 28 | 18 | 120 | 19 |
| PANAMA | LLFB | 17 | 20 | 8 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ESPANA | LLHB | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 14 | 0 |
| USA | LL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 39 | 11 | 103 |
| USA | SPOR | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 141 | 143 | 141 | 31 |
| USA | HARP | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ** | ** |
| USA | HAND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | ++ |
| VENEZUEL | LL | 107 | 108 | 127 | 181 | 110 | 140 | 112 | 230 | 148 | 148 | 148 |
| SOUTH ATL | | 765 | 478 | 511 | 533 | 450 | 352 | 439 | 295 | 396 | 659 | 530 |
| ARGENTIN | LL | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ARGENTIN | UNCL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 |
| BRASIL | LLHB | 31 | 12 | 20 | 17 | 32 | 31 | 23 | 41 | 52 | 4 | 0 |
| BRASIL | SURF | 25 | 3 | 2 | 4 | 3 | ++ | ++ | ++ | ++ | 0 | 0 |
| BRASIL | SPOR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ++ | ++ | ++ |
| BRAS.JPN | LLFB | 0 | 91 | 143 | 111 | 26 | 5 | 59 | 25 | 8 | 36 | 36 |
| BRAS.KOR | LLFB | 10 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| CHI.TAIW | LLFB | 377 | 119 | 197 | 155 | 145 | 136 | 220 | 87 | 66 | 134 | 138 |
| CUBA | LL | 38 | 57 | 127 | 205 | 212 | 116 | 45 | 112 | 153 | 216 | 234 |
| JAPAN | LLHB | 3 | 26 | 14 | 15 | 7 | 25 | 27 | 17 | 24 | 81 | 93 |
| KOREA | LLFB | 220 | 111 | 5 | 24 | 25 | 37 | 60 | 13 | 39 | 184 | 25 |
| PANAMA | LLFB | 59 | 31 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| URUGUAY | LLHB | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 0 | 54 | 0 | 0 |
| USSR | LLMB | 0 | 3 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| UNCL. REGION | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 43 |
| CHI.TAIW | LLFB | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 43 |

++ - Catch less than 0.5 MT.
** - Unknown catch.
Note: Slight changes in the figures for recent years since SCRS adapted the table to updated data.

Table 14. Atlantic sailfish catch (MT)

| COUNTRY | GEAR | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 |
|---|---|---|---|---|---|---|---|
| TOTAL | | 2766 | 2820 | 2451 | 1633 | 1344 | 1204 |
| EAST ATL | | 98 | 126 | 161 | 160 | 124 | 165 |
| GHANA | BBF | 0 | 0 | 0 | 2 | 8 | 22 |
| SENEGAL | TROL | 0 | 0 | 0 | 0 | 0 | 75 |
| SENEGAL | SURF | 74 | 74 | 74 | 74 | 74 | 0 |
| SENEGAL | SPOR | 13 | 38 | 48 | 70 | 33 | 61 |
| USSR | LLMB | 11 | 14 | 39 | 14 | 9 | 7 |
| WEST ATL | | 697 | 651 | 457 | 391 | 445 | 436 |
| ARUBA | UNCL | ++ | ++ | ++ | ++ | 10 | 10 |
| BRASIL | LLHB | 21 | 70 | 105 | 37 | 82 | 88 |
| NLD.ANT. | UNCL | 28 | 28 | 28 | 28 | 28 | 28 |
| USA | SPOR | 220 | 227 | 233 | 240 | 248 | 254 |
| VENEZUEL | LL | 428 | 326 | 91 | 86 | 77 | 56 |
| UNCL. REGION | | 1971 | 2043 | 1833 | 1082 | 775 | 603 |
| CHI.TAIW | LLFB | 498 | 779 | 802 | 598 | 248 | 66 |
| CUBA | LL | 100 | 51 | 30 | 100 | 229 | 262 |
| JAPAN | LLMB | 313 | 211 | 92 | 0 | 0 | 0 |
| JAPAN | LLFB | 136 | 31 | 3 | 1 | 0 | 0 |
| JAPAN | LLHB | 145 | 204 | 126 | 143 | 137 | 150 |
| KOREA | LLFB | 779 | 767 | 745 | 165 | 139 | 109 |
| PANAMA | LLFB | ** | ** | 35 | 75 | 22 | 16 |

| COUNTRY | GEAR | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL | | 1526 | 1922 | 2649 | 3286 | 2467 | 2076 | 2003 | 3654 | 3463 | 3526 | 3642 |
| EAST ATL | | 193 | 816 | 1729 | 2351 | 1517 | 1052 | 876 | 2824 | 2402 | 2519 | 2810 |
| BENIN | GILL | 0 | 0 | 0 | 0 | 0 | 34 | 45 | 0 | 50 | 50 | 25 |
| BENIN | HS | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 0 | 3 | 0 | 0 |
| CAP VERT | LL | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 |
| CHI.TAIW | LLFB | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 9 | 0 |
| C.IVOIRE | SURF | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ** | ** | ** |
| CUBA | LL | 0 | 0 | 0 | 0 | 0 | 0 | 158 | 200 | 115 | 19 | 23 |
| GHANA | SURF | 0 | 0 | 0 | 0 | 1191 | 449 | 16 | 2161 | 2067 | 2100 | 2136 |
| GHANA | BBF | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| GHANA | GILL | 0 | 638 | 1574 | 2246 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| KOREA | LLFB | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 54 | 3 |
| KOREA | BBF | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SENEGAL | PS | 0 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 |
| SENEGAL | TROL | 91 | 72 | 71 | 28 | 264 | 442 | 540 | 412 | 93 | 244 | 569 |
| SENEGAL | SURF | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 1 | 0 |
| SENEGAL | SPOR | 76 | 93 | 79 | 77 | 62 | 88 | 69 | 49 | 41 | 35 | 43 |
| SENEGAL | TRAW | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| ESPANA | LLHB | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 4 | 7 | 9 |
| USSR | LLMB | 1 | 13 | 5 | 0 | 0 | 37 | 0 | 0 | 0 | 0 | 2 |
| WEST ATL | | 549 | 697 | 689 | 642 | 625 | 566 | 766 | 646 | 887 | 885 | 729 |
| ARUBA | UNCL | 20 | 20 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| BRASIL | LLHB | 114 | 96 | 98 | 42 | 81 | 46 | 61 | 42 | 86 | 34 | 0 |
| BRASIL | SURF | 62 | 119 | 90 | 84 | 87 | 55 | 53 | 8 | 4 | 0 | 0 |
| BRASIL | SPOR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 37 | 26 | 35 |
| BRAS.JPN | LLFB | 0 | 0 | 41 | 26 | 12 | ++ | 7 | 7 | 1 | 2 | 2 |
| BRAS.KOR | LLFB | 10 | 41 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| CHI.TAIW | LLFB | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 42 | 39 | 0 |
| CUBA | LL | 0 | 0 | 0 | 0 | 0 | 0 | 181 | 28 | 169 | 130 | 82 |
| DOMIN.R. | SURF | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 50 | 49 | 46 | 18 |
| GRENADA | UNCL | 0 | 31 | 37 | 40 | 31 | 36 | 27 | 37 | 66 | 164 | 211 |
| KOREA | LLFB | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 135 | 69 |
| NLD.ANT. | UNCL | 28 | 28 | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 10 | 10 |
| USA | LL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| USA | SPOR | 261 | 308 | 308 | 308 | 308 | 308 | 308 | 308 | 308 | 195 | 195 |
| VENEZUEL | LL | 54 | 54 | 64 | 91 | 55 | 70 | 56 | 115 | 74 | 74 | 74 |
| UNCL. REGION | | 784 | 409 | 231 | 293 | 325 | 458 | 361 | 184 | 174 | 122 | 103 |
| CHI.TAIW | LLFB | 270 | 64 | 52 | 37 | 49 | 86 | 140 | 108 | 0 | 0 | 0 |
| CUBA | LL | 185 | 156 | 120 | 191 | 198 | 213 | 0 | 0 | 0 | 0 | 0 |
| JAPAN | LLHB | 137 | 47 | 20 | 39 | 55 | 94 | 173 | 69 | 97 | 122 | 103 |
| KOREA | LLFB | 151 | 111 | 32 | 24 | 23 | 65 | 48 | 7 | 77 | 0 | 0 |
| PANAMA | LLFB | 41 | 31 | 7 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

++ - Catch less than 0.5 MT.
** - Unknown catch.
Note: Slight changes in recent years' catch since SCRS adapted table to updated data.

Table 15. Atlantic swordfish catch (1,000 MT)

| | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL | 12.6 | 13.2 | 13.4 | 13.6 | 13.0 | 13.4 | 19.2 | 19.5 | 22.9 | 19.4 | 23.2 | 25.4 | 31.5 | 35.1 | 34.0 |
| ATLANTIC | 7.1 | 8.8 | 8.8 | 9.7 | 8.8 | 8.5 | 13.7 | 14.4 | 17.5 | 13.7 | 17.9 | 19.6 | 20.6 | 22.2 | 20.8 |
| BRASIL | 0.1 | 0.1 | 0.3 | 0.3 | 0.4 | 0.4 | 0.3 | 0.4 | 1.5 | 0.6 | 1.0 | 0.8 | 0.5 | 0.4 | 0.6 |
| CANADA | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 2.3 | 3.0 | 1.9 | 0.6 | 0.6 | 1.1 | 0.5 | 0.6 | 1.0 |
| CHINA (TAIWAN) | 0.8 | 1.1 | 0.8 | 0.9 | 0.9 | 0.7 | 0.6 | 1.3 | 0.6 | 0.5 | 0.6 | 0.4 | 0.3 | 0.3 | 0.3 |
| CUBA | 0.1 | 0.5 | 1.1 | 0.5 | 0.6 | 0.7 | 0.6 | 0.4 | 0.6 | 0.4 | 0.7 | 1.2 | 1.4 | 1.5 | 0.7 |
| JAPAN | 1.8 | 1.0 | 1.4 | 1.5 | 0.8 | 0.8 | 0.9 | 1.0 | 2.1 | 2.2 | 3.7 | 1.9 | 3.8 | 4.3 | 2.4 |
| KOREA | 0.4 | 1.0 | 0.7 | 0.5 | 1.1 | 1.2 | 1.3 | 0.6 | 0.7 | 0.4 | 0.7 | 0.5 | 0.4 | 0.3 | 0.1 |
| PANAMA | 0.0 | 0.4 | 0.1 | 0.1 | 0.3 | 0.1 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| ESPANA | 3.2 | 3.8 | 2.9 | 3.7 | 2.8 | 3.3 | 3.6 | 2.6 | 3.8 | 4.0 | 4.6 | 7.1 | 6.3 | 7.4 | 8.0 |
| USA | 0.2 | 0.4 | 1.1 | 1.7 | 1.4 | 0.9 | 3.7 | 4.6 | 5.6 | 4.5 | 5.1 | 4.8 | 4.5 | 4.6 | 4.9 |
| URUGUAY | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.7 | 1.5 | 2.5 | 1.7 | 0.7 |
| USSR | 0.2 | 0.2 | 0.1 | 0.3 | 0.2 | 0.1 | 0.2 | 0.1 | 0.2 | 0.0 | 0.1 | 0.0 | 0.2 | 0.1 | 0.0 |
| OTHERS | 0.2 | 0.2 | 0.1 | 0.1 | 0.2 | 0.2 | 0.1 | 0.4 | 0.5 | 0.2 | 0.3 | 0.3 | 0.4 | 1.0 | 2.0 |
| MEDITERRANEAN | 5.5 | 4.4 | 4.6 | 3.9 | 4.2 | 4.9 | 5.5 | 5.1 | 5.4 | 5.7 | 5.3 | 5.8 | 10.9 | 12.9 | 13.3 |
| ALGERIE | 0.0 | 0.1 | 0.2 | 0.5 | 0.4 | 0.4 | 0.3 | 0.5 | 0.6 | 0.8 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| ITALY | 3.7 | 2.8 | 3.3 | 3.0 | 3.3 | 3.3 | 4.0 | 3.5 | 3.7 | 3.4 | 2.6 | 2.7 | 7.6 | 9.6 | 9.6 |
| MALTA | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 |
| MAROC | 0.2 | 0.2 | 0.2 | 0.1 | 0.2 | 0.1 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| ESPANA | 1.3 | 1.1 | 0.7 | 0.1 | 0.1 | 0.7 | 0.7 | 0.8 | 0.8 | 1.1 | 0.9 | 1.3 | 1.2 | 1.2 | 1.3 |
| OTHERS | 0.1 | 0.1 | 0.0 | 0.0 | 0.1 | 0.2 | 0.1 | 0.2 | 0.1 | 0.2 | 0.7 | 0.8 | 1.0 | 1.1 | 1.2 |

Table 16. Swordfish catch-at-age in the western North Atlantic (Areas 1 to 3 in SCRS/87/17, Fig. 1) in 1978–1985. Age 15+ refers to fish that were 15 or more years old

| | NUMBER OF CATCH | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Age | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 |
| 0 | 529 | 1669 | 5263 | 3149 | 7516 | 6482 | 7159 | 8028 |
| 1 | 6511 | 13345 | 29667 | 13616 | 20410 | 27132 | 29153 | 25139 |
| 2 | 21209 | 22972 | 36824 | 24548 | 24836 | 23012 | 26828 | 25720 |
| 3 | 24570 | 20030 | 23785 | 15368 | 17213 | 16308 | 14293 | 14958 |
| 4 | 15057 | 12734 | 13660 | 9045 | 9503 | 10620 | 7664 | 7347 |
| 5 | 9349 | 7590 | 7575 | 5700 | 5099 | 6179 | 4031 | 3638 |
| 6 | 4349 | 4046 | 3804 | 3347 | 2580 | 3208 | 2036 | 1792 |
| 7 | 2131 | 2175 | 2082 | 1912 | 1766 | 1755 | 1064 | 992 |
| 8 | 884 | 1560 | 1271 | 1263 | 932 | 1251 | 648 | 610 |
| 9 | 744 | 808 | 586 | 671 | 650 | 699 | 353 | 347 |
| 10 | 442 | 484 | 415 | 439 | 343 | 372 | 233 | 196 |
| 11 | 281 | 291 | 287 | 222 | 191 | 199 | 154 | 114 |
| 12 | 150 | 313 | 223 | 206 | 163 | 211 | 118 | 116 |
| 13 | 0 | 15 | 20 | 16 | 37 | 38 | 14 | 16 |
| 14 | 216 | 267 | 177 | 130 | 98 | 149 | 51 | 50 |
| 15+ | 3576 | 5376 | 4016 | 4232 | 3914 | 3427 | 2153 | 1875 |
| TOTAL | 89999 | 93675 | 129656 | 83861 | 95250 | 101042 | 95953 | 90938 |

Table 17. Swordfish catch-at-age in the central North Atlantic (Area 4-A in SCRS/87/17, Fig. 1) in 1978-1985. Age 15+ refers to fish that were 15 or more years old

| | NUMBER OF CATCH | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Age | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 |
| 0 | 105 | 71 | 292 | 4 | 229 | 316 | 1064 | 851 |
| 1 | 2542 | 3199 | 4157 | 1254 | 1498 | 2259 | 5584 | 6838 |
| 2 | 10063 | 8937 | 9400 | 7673 | 8189 | 5976 | 13914 | 22443 |
| 3 | 16340 | 12460 | 10406 | 8284 | 9320 | 9991 | 12770 | 22477 |
| 4 | 13229 | 9107 | 5939 | 6276 | 6209 | 4860 | 6554 | 12353 |
| 5 | 5604 | 5323 | 4178 | 2317 | 2073 | 2634 | 2817 | 5168 |
| 6 | 2492 | 2909 | 1698 | 1344 | 1135 | 1049 | 1141 | 2343 |
| 7 | 1505 | 1702 | 1008 | 539 | 1159 | 466 | 573 | 1153 |
| 8 | 368 | 737 | 465 | 263 | 562 | 243 | 285 | 604 |
| 9 | 1149 | 567 | 351 | 169 | 401 | 153 | 164 | 379 |
| 10 | 646 | 409 | 221 | 128 | 166 | 83 | 111 | 206 |
| 11 | 426 | 188 | 161 | 68 | 164 | 42 | 63 | 124 |
| 12 | 14 | 167 | 66 | 59 | 82 | 42 | 69 | 91 |
| 13 | 0 | 18 | 5 | 13 | 11 | 10 | 12 | 12 |
| 14 | 21 | 149 | 44 | 28 | 16 | 15 | 30 | 56 |
| 15+ | 1946 | 3896 | 1608 | 1341 | 2427 | 782 | 767 | 1405 |
| TOTAL | 56451 | 49840 | 39998 | 29760 | 33639 | 28921 | 45918 | 76506 |

Table 18. Swordfish catch-at-age in the eastern North Atlantic (Area 4-B in SCRS/87/17, Fig. 1) in 1978-1985. Age 15+ refers to fish that were 15 or more years old

| | NUMBER OF CATCH | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| AGE | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 |
| 0 | 890 | 1296 | 3122 | 3718 | 1495 | 4386 | 4429 | 4722 |
| 1 | 6133 | 7971 | 11094 | 12262 | 8250 | 24163 | 14808 | 24725 |
| 2 | 13842 | 12458 | 17188 | 19763 | 16239 | 36697 | 27404 | 36176 |
| 3 | 19453 | 11807 | 19109 | 22089 | 25559 | 36886 | 29161 | 32696 |
| 4 | 17261 | 8481 | 11761 | 12413 | 18987 | 21021 | 16971 | 16727 |
| 5 | 10391 | 4866 | 6017 | 5048 | 7780 | 8359 | 6981 | 7066 |
| 6 | 5746 | 2462 | 4349 | 2954 | 4083 | 4002 | 2942 | 3409 |
| 7 | 4006 | 1095 | 2321 | 1689 | 2560 | 1530 | 1479 | 1650 |
| 8 | 1324 | 552 | 917 | 787 | 1109 | 752 | 777 | 838 |
| 9 | 2135 | 567 | 964 | 458 | 790 | 485 | 462 | 530 |
| 10 | 1604 | 332 | 670 | 280 | 399 | 236 | 241 | 278 |
| 11 | 938 | 148 | 341 | 147 | 308 | 134 | 122 | 129 |
| 12 | 299 | 65 | 158 | 126 | 191 | 76 | 114 | 82 |
| 13 | 230 | 0 | 71 | 50 | 47 | 28 | 60 | 29 |
| 14 | 150 | 65 | 88 | 82 | 85 | 52 | 61 | 57 |
| 15+ | 8644 | 1770 | 3264 | 2024 | 3653 | 1578 | 1661 | 1352 |
| TOTAL | 93046 | 53933 | 81432 | 83889 | 91533 | 140383 | 107673 | 130466 |

Table 19. Swordfish catch-at-age in the Mediterranean Sea in 1978-1985. Age 15+ refers to fish that were 15 or more years old

| | NUMBER OF CATCH | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| AGE | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985* |
| 0 | 15171 | 26883 | 12168 | 42262 | 10209 | 172433 | 321755 | 113598 |
| 1 | 82150 | 70083 | 68378 | 74939 | 100216 | 106070 | 197924 | 165143 |
| 2 | 51024 | 34691 | 60859 | 52921 | 67330 | 35390 | 66054 | 34496 |
| 3 | 23825 | 18487 | 16468 | 14801 | 12935 | 12285 | 22943 | 9887 |
| 4 | 8114 | 4383 | 7315 | 12510 | 4914 | 6060 | 11323 | 3153 |
| 5 | 0 | 1278 | 1384 | 718 | 388 | 521 | 977 | 576 |
| 6 | 0 | 142 | 505 | 1852 | 27 | 134 | 255 | 168 |
| 7 | 0 | 710 | 857 | 350 | 108 | 89 | 171 | 107 |
| 8 | 0 | 568 | 0 | 0 | 0 | 11 | 25 | 70 |
| 9 | 606 | 426 | 216 | 0 | 81 | 5 | 11 | 41 |
| 10 | 404 | 284 | 144 | 0 | 54 | 1 | 2 | 39 |
| 11 | 0 | 0 | 0 | 0 | 0 | 14 | 22 | 3 |
| 12 | 0 | 0 | 0 | 0 | 0 | 12 | 29 | 0 |
| 13 | 0 | 0 | 0 | 0 | 0 | 3 | 8 | 0 |
| 14 | 0 | 0 | 0 | 0 | 0 | 11 | 21 | 0 |
| 15+ | 0 | 0 | 373 | 589 | 135 | 37 | 77 | 16 |
| TOTAL | 181295 | 157935 | 168666 | 201242 | 196398 | 333075 | 621596 | 327296 |

*After the analysis, the catch data were modified slightly upwards.

Table 20. Swordfish catch-at-age in the South Atlantic (Areas 6 & 7 in SCRS/87/17, Fig. 1) in 1978-1985. Age 15+ refers to fish that were more than 15 years old

| AGE | NUMBER OF CATCH | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 |
| 0 | 260 | 279 | 229 | 565 | 1399 | 1026 | 6506 | 300 |
| 1 | 1109 | 1132 | 1037 | 1912 | 6731 | 8548 | 17533 | 4859 |
| 2 | 1225 | 4879 | 3496 | 2739 | 14591 | 10795 | 22116 | 13265 |
| 3 | 1579 | 9317 | 9534 | 5112 | 21918 | 14357 | 22943 | 27847 |
| 4 | 3390 | 6507 | 9080 | 7414 | 15336 | 14072 | 20675 | 28807 |
| 5 | 7130 | 4817 | 12049 | 6388 | 12293 | 13296 | 13677 | 15139 |
| 6 | 5039 | 3137 | 8112 | 4275 | 4979 | 4140 | 7712 | 5707 |
| 7 | 2653 | 2114 | 3002 | 2075 | 2385 | 1865 | 3419 | 3373 |
| 8 | 599 | 1032 | 796 | 1741 | 824 | 175 | 1395 | 1427 |
| 9 | 1447 | 1400 | 711 | 1096 | 728 | 420 | 1148 | 973 |
| 10 | 756 | 695 | 470 | 610 | 501 | 305 | 687 | 604 |
| 11 | 779 | 867 | 265 | 610 | 259 | 188 | 596 | 363 |
| 12 | 210 | 332 | 51 | 269 | 131 | 14 | 218 | 100 |
| 13 | 105 | 90 | 80 | 110 | 132 | 3 | 225 | 143 |
| 14 | 2 | 4 | 2 | 2 | 6 | 4 | 11 | 17 |
| 15+ | 6173 | 2473 | 1423 | 5376 | 1546 | 747 | 3350 | 3567 |
| TOTAL | 32454 | 39075 | 50335 | 40296 | 83760 | 69954 | 122212 | 106490 |

Table 21. Conversion equations reported on various measurements of swordfish

| A= | B= | AREA | TIME | N | MIN | MAX | SOURCES | EQ # | SELECTED |
|---|---|---|---|---|---|---|---|---|---|
| **LOWER JAW-FORK LENGTH TO ROUND WEIGHT** | | | | | | | | | |
| RWT(kg) = A * LJ-F(cm)$^B$ | | | | | | | | | |
| .30399E-05 | 3.2854 | IBERICA | Q-1 | 1638 | 94 - | 248 | J.MEJUTO, SCRS/87/37 | 1 | |
| .64328E-05 | 3.1291 | IBERICA | Q-2 | 921 | 93 - | 251 | J.MEJUTO, SCRS/87/37 | 2 | |
| .33816E-05 | 3.2532 | IBERICA | Q-3 | 102 | 98 - | 232 | J.MEJUTO, SCRS/87/37 | 3 | |
| .21258E-05 | 3.3666 | IBERICA | Q-4 | 1368 | 95 - | 247 | J.MEJUTO, SCRS/87/37 | 4 | |
| .34333E-05 | 3.2623 | IBERICA | YR | 4049 | 93 - | 251 | J.MEJUTO, SCRS/87/37 | 5 | |
| .55224E-05 | 3.1576 | N.C.W.ATL. | Q-2 | 1174 | 99 - | 251 | J.MEJUTO, SCRS/87/37 | 6 | |
| .36186E-05 | 3.2458 | N.C.W.ATL. | Q-3 | 1218 | 80 - | 258 | J.MEJUTO, SCRS/87/37 | 7 | |
| .12032E-05 | 3.4585 | N.C.W.ATL. | Q-4 | 177 | 110 - | 253 | J.MEJUTO, SCRS/87/37 | 8 | |
| .42030E-05 | 3.2134 | N.C.W.ATL. | YR | 2569 | 80 - | 253 | J.MEJUTO, SCRS/87/37 | 9 | AREA 4A |
| .1824 E-04 | 2.9950 | SW ATL. | YR | | | | CALC'D BASED SCRS/78/51 | 10 | |
| .961669E-06 | 3.533 | MEDIT. | YR | 48 | 71 - | 177 | J.C.REY, SCRS/87/37 | 36 | |
| .28833E-05 | 3.2623 | AREA 4-B | YR | 11410 | | | CALC'D FROM J.MEJUTO-SCRS/87/37 | | AREA 4B |
| **LOWER JAW-FORK TO DRESSED WEIGHT** | | | | | | | | | |
| DWT(Lbs.) = A * LJ-F(cm)$^B$ | | | | | | | | | |
| .1133E-04 | 3.1110 | NW ATL. | FEB | 178 | 122 | 206 | S.TURNER, MIAMI WS 86/11 | 11 | |
| .6152E-05 | 3.2380 | NW ATL. | APR | 22 | 125 | 209 | S.TURNER, MIAMI WS 86/11 | 12 | |
| .1791E-04 | 3.0220 | NW ATL. | MAY | 24 | 125 | 205 | S.TURNER, MIAMI WS 86/11 | 13 | |
| .2914W-05 | 3.3760 | NW ATL. | JUN | 35 | 121 | 207 | S.TURNER, MIAMI WS 86/11 | 14 | |
| .1311E-04 | 3.0770 | NW ATL. | JUL | 78 | 121 | 207 | S.TURNER, MIAMI WS 86/11 | 15 | |
| .2174E-05 | 3.4420 | NW ATL. | AUG | 39 | 121 | 203 | S.TURNER, MIAMI WS 86/11 | 16 | |
| .2715E-05 | 3.4110 | NW ATL. | SEP | 28 | 120 | 209 | S.TURNER, MIAMI WS 86/11 | 17 | |
| .8779E-05 | 3.1670 | NW ATL. | OCT | 21 | 124 | 209 | S.TURNER, MIAMI WS 86/11 | 18 | |
| .10123E-04 | 3.1370 | NW ATL. | YR | 551 | 82 | 287 | S.TURNER, MIAMI WS 86/11 | 19 | AREAS 1-3 |
| GG(kg) = A * LJ-F(cm)$^B$ | | | | | | | | | |
| .64338E-05 | 3.109 | GUINEA | Q-1 | 1333 | 93 - | 251 | J.MEJUTO, SCRS/87/37 | 20 | |
| .30415E-05 | 3.253 | GUINEA | Q-2 | 742 | 92 - | 266 | J.MEJUTO, SCRS/87/37 | 21 | |
| .29082E-05 | 3.271 | GUINEA | Q-3 | 763 | 89 - | 252 | J.MEJUTO, SCRS/87/37 | 22 | |
| .65265E-05 | 3.113 | GUINEA | Q-4 | 762 | 95 - | 242 | J.MEJUTO, SCRS/87/37 | 23 | |
| .43491E-05 | 3.188 | GUINEA | YR | 3600 | 89 - | 266 | J.MEJUTO, SCRS/87/37 | 24 | AREA 7 |
| .68566E-05 | 3.101 | SENEGAL | Q-1 | 572 | 98 - | 253 | J.MEJUTO, SCRS/87/37 | 25 | |
| .51250E-05 | 3.152 | SENEGAL | Q-2 | 947 | 99 - | 266 | J.MEJUTO, SCRS/87/37 | 26 | |
| .12197E-05 | 3.444 | SENEGAL | Q-3 | 1016 | 88 - | 249 | J.MEJUTO, SCRS/87/37 | 27 | |
| .16409E-05 | 3.381 | SENEGAL | Q-4 | 1848 | 89 - | 237 | J.MEJUTO, SCRS/87/37 | 28 | |
| .25608E-05 | 3.293 | SENEGAL | YR | 4383 | 88 - | 266 | J.MEJUTO, SCRS/87/37 | 29 | |
| .29495E-05 | 3.271 | CANARIAS | Q-1 | 839 | 86 - | 239 | J.MEJUTO, SCRS/87/37 | 30 | |
| .24002E-05 | 3.315 | CANARIAS | Q-2 | 554 | 90 - | 238 | J.MEJUTO, SCRS/87/37 | 31 | |
| .20424E-05 | 3.346 | CANARIAS | Q-3 | 657 | 84 - | 226 | J.MEJUTO, SCRS/87/37 | 32 | |
| .10952E-05 | 3.467 | CANARIAS | Q-4 | 928 | 87 - | 246 | J.MEJUTO, SCRS/87/37 | 33 | |
| .185844E-3 | 3.363 | CANARIAS | YR | 2978 | 84 - | 246 | J.MEJUTO, SCRS/87'37 | 34 | |
| DWT(kg) = A * LJ-F(cm)$^B$ | | | | | | | | | |
| .517 E-05 | 3.16 | NE ATL. | YR | 486 | 90 - | 234 | REY & GARCES, SCRS/78/87 | 35 | |
| .97 E-06 | 3.49 | MEDIT. | YR | 105 | 94 - | 166 | REY & GARCES, SCRS/78/87 | 37 | |
| .51392E-05 | 3.1110 | NW ATL. | FEB | 178 | 122 | 206 | MIAMI WS 86/11 CONVT'D | 11 | |
| .27905E-05 | 3.2380 | NW ATL. | APR | 22 | 125 | 209 | MIAMI WS 86/11 CONVT'D | 12 | |
| .81238E-05 | 3.0220 | NW ATL. | MAY | 24 | 125 | 205 | MIAMI WS 86/11 CONVT'D | 13 | |
| .13218E-05 | 3.3760 | NW ATL. | JUN | 35 | 121 | 207 | MIAMI WS 86/11 CONVT'D | 14 | |
| .59466E-05 | 3.0770 | NW ATL. | JUL | 78 | 121 | 207 | MIAMI WS 86/11 CONVT'D | 15 | |
| .98611E-06 | 3.4420 | NW ATL. | AUG | 39 | 121 | 203 | MIAMI WS 86/11 CONVT'D | 16 | |
| .12315E-05 | 3.4110 | NW ATL. | SEP | 28 | 120 | 209 | MIAMI WS 86/11 CONVT'D | 17 | |
| .39821E-05 | 3.1670 | NW ATL. | OCT | 21 | 124 | 209 | MIAMI WS 86/11 CONVT'D | 18 | |

Table 21 (Cont.)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| .45917E-05 | 3.1370 | NW ATL. | YR | 551 | 82 | | T'D | 19 | |
| .124 E-04 | 3.04 | SW ATL. | YR | | | | AMORIM et al SCRS/78/51 | 38 | AREA 6 |
| .5701E-05 | 3.16 | MEDIT. | YR | 462 | 64 - | 205 | G.DE METRIO, P.MEGALOFONO- IN PRESS | 39 | AREA 5 |

EYE-FORK LENGTH TO DRESSED WEIGHT

DWT(Lbs.) = A * E-F(cm)$^B$

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| .2849E-04 | 3.0185 | NW ATL. | YR | 119 | 91 | 221 | S.TURNER, MIAMI WS 86/11 |

DWT(kg.) = A * E-F(cm)$^B$

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| .12923E-04 | 3.0185 | NW ATL. | YR | 119 | 91 | 221 | MIAMI WS 86/11 CONVT'D |

TOTAL LENGTH TO DRESSED WEIGHT

DWT(Lbs.) = A * TL(cm)$^B$

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| .3771E-05 | 3.0742 | NW ATL. | YR | 117 | 155 | 380 | S.TURNER, MIAMI WS 86/11 |

DWT(kg.) = A * TL(cm)$^B$

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| .17105E-05 | 3.0742 | NW ATL. | YR | 117 | 155 | 380 | MIAMI WS 86/11 CONVT'D |

DRESSED WEIGHT TO LOWER JAW-FORK LENGTH

LJ-F(cm) = A * DWT(Lbs)$^B$

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 44.2237 | .29257 | NW ATL. | YR | 551 | 4 | 473 | S.TURNER, MIAMI WS 86/11 |

DRESSED WEIGHT TO EYE-FORK LENGTH

EFL(cm) = A * DWT(Lbs)$^B$

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 36.10826 | .30622 | NW ATL. | YR | 117 | 14 | 345 | S.TURNER, MIAMI WS 86/11 |

DRESSED WEIGHT TO TOTAL LENGTH

TL(cm) = A * DWT(Lbs)$^B$

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 68.18065 | .29126 | NW ATL. | YR | 117 | 14 | 345 | S.TURNER, MIAMI WS 86/11 |

EYE-FORK LENGTH TO LOWER JAW-FORK LENGTH

LJ-F(cm) = A + B * E-F(cm)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 7.821534 | 1.0897 | E.ATL+MED. | YR | 251 | | | REY & GARCES, SCRS/78/87 |

ROUND WEIGHT TO DRESSED WEIGHT

DWT(kg) = A * RWT(kg)$^B$

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| .8009 | 1.015 | SW ATL. | YR | 127 | | | AMORIM et al SCRS/78/51 |
| .75 | 1.04 | NE ATL. | YR | 40 | | | AMORIM et al SCRS/78/51 |
| .75 | 1.00 | NW ATL. | YR | | | | U.S.A. |
| .760 | 1.00 | NE ATL. | YR | | | | SPAIN |

GG = A * RWT$^B$

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 0.8772 | 1.00 | | | | | | SPAIN |

---

AREAS

| | |
|---|---|
| GUINEA | 5°N-10°N, 5°W-30°W |
| SENEGAL | 10°N-25°N, east of 30°W |
| CANARIAS | 25°N-35°N, east of 30°W |
| IBERICA | 35°N-45°N, east of 30°W |
| N.C.W. ATL. | 30°N-50°N, 30°W-50°W |

Table 22. Atlantic and world southern bluefin catches (MT) by gear, area and country

| | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ATLANTIC TOTAL | 745 | 3168 | 4680 | 6203 | 2823 | 2569 | 1138 | 514 | 1636 | 1476 | 279 |
| CATCH BY GEAR | | | | | | | | | | | |
| Longline | 745 | 3168 | 4680 | 6203 | 2810 | 2563 | 1138 | 514 | 1636 | 1476 | 279 |
| Baitboat | 0 | 0 | 0 | 0 | 13 | 6 | 0 | 0 | 0 | 0 | 0 |
| Sport | 0 | 0 | 0 | 0 | 0 | 0 | ++ | 0 | 0 | 0 | 0 |
| CATCH BY COUNTRY | | | | | | | | | | | |
| China Taiwan | 53 | 0 | 29 | 11 | 22 | 57 | 3 | 9 | 0 | 8 | 0 |
| Japan | 692 | 3168 | 4651 | 6192 | 2788 | 2506 | 1135 | 505 | 1636 | 1468 | 279 |
| South Africa | 0 | 0 | 0 | 0 | 13 | 6 | ++ | 0 | 0 | 0 | 0 |
| WORLD CATCHES (all oceans) | | | | | | | | | | | |
| Longline | 33714 | 29595 | 22974 | 27715 | 33364 | 28056 | 20809 | 24735 | 23323 | 20393 | 17000* |
| Surface | 8383 | 12569 | 12190 | 10783 | 11325 | 17016 | 21709 | 17807 | 13497 | 12688 | 12614* |
| Total | 42097 | 42164 | 35164 | 38498 | 44689 | 45072 | 42518 | 42542 | 36820 | 33081 | 29614* |

*Preliminary.

Source for "world" section: Report of the Sixth Meeting of Australian, Japanese and New Zealand Scientists on Southern Bluefin Tuna (SBT), Hobart, Australia, August, 1987.

Table 23. Atlantic small tuna catch (1,000 MT)

| | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL | | | | | | | | | | | | | | | |
| ATLANTIC + MEDITERR. | 87.4 | 66.8 | 90.7 | 74.3 | 68.7 | 89.6 | 83.3 | 83.6 | 113.1 | 108.3 | 125.4 | 123.8 | 96.6 | 91.6 | 89.1 |
| MEDITERRANEAN | 20.7 | 11.1 | 13.4 | 10.3 | 12.7 | 14.5 | 15.4 | 19.8 | 25.4 | 33.6 | 37.2 | 40.8 | 20.6 | 24.4 | 22.5 |
| ATLANTIC | 66.7 | 55.7 | 77.4 | 63.9 | 56.0 | 75.2 | 67.9 | 63.8 | 87.7 | 74.7 | 88.2 | 83.0 | 76.0 | 67.2 | 66.6 |
| ATLANTIC BONITO (S. SARDA) | | | | | | | | | | | | | | | |
| ATLANTIC + MEDITERR. | 25.0 | 12.3 | 21.4 | 15.6 | 16.0 | 20.7 | 17.3 | 20.0 | 31.5 | 39.1 | 44.1 | 42.5 | 21.1 | 25.1 | 22.0 |
| MEDITERRANEAN | 16.2 | 6.3 | 7.7 | 6.0 | 6.5 | 8.7 | 9.4 | 13.5 | 18.9 | 29.0 | 31.2 | 35.5 | 14.9 | 18.4 | 16.8 |
| GREECE | 0.6 | 0.5 | 0.5 | 0.7 | 0.5 | 0.6 | 0.6 | 0.7 | 0.8 | 1.3 | 1.4 | 1.4 | 1.7 | 1.6 | 1.6 |
| ITALY | 1.0 | 0.7 | 0.8 | 1.0 | 1.0 | 1.5 | 1.4 | 1.4 | 1.2 | 1.1 | 1.1 | 1.8 | 2.8 | 1.4 | 1.4 |
| ESPANA | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.6 | 0.7 | 0.7 | 0.5 | 0.7 | 1.0 | 1.2 | 1.0 | 1.0 | 0.7 |
| TURKEY | 13.9 | 3.9 | 5.3 | 3.4 | 3.2 | 4.5 | 5.5 | 9.1 | 14.9 | 24.3 | 26.0 | 29.5 | 7.8 | 12.8 | 11.4 |
| OTHERS | 0.5 | 0.9 | 0.8 | 0.7 | 1.5 | 1.5 | 1.2 | 1.6 | 1.5 | 1.7 | 1.7 | 1.7 | 1.6 | 1.5 | 1.5 |
| ATLANTIC | 8.8 | 6.1 | 13.7 | 9.6 | 9.5 | 12.0 | 7.9 | 6.5 | 12.6 | 10.0 | 12.8 | 7.0 | 6.2 | 6.7 | 5.2 |
| ARGENTINA | 2.9 | 1.2 | 2.3 | 0.2 | 0.3 | 2.0 | 1.7 | 1.3 | 2.6 | 0.8 | 1.8 | 0.3 | 2.1 | 1.4 | 0.7 |
| USSR | 0.2 | 0.0 | 1.4 | 1.5 | 1.3 | 4.2 | 1.6 | 2.1 | 6.4 | 4.6 | 6.3 | 2.4 | 1.3 | 2.1 | 1.1 |
| OTHERS | 5.7 | 4.9 | 10.0 | 7.8 | 7.9 | 5.8 | 4.5 | 3.1 | 3.5 | 4.6 | 4.7 | 4.3 | 2.9 | 3.2 | 3.4 |
| ATLANTIC BLACK SKIPJACK (E. ALLETTERATUS) | | | | | | | | | | | | | | | |
| ATLANTIC + MEDITERR. | 2.9 | 2.4 | 5.1 | 4.2 | 3.9 | 6.2 | 16.6 | 13.1 | 17.7 | 13.4 | 12.8 | 23.0 | 16.2 | 10.5 | 8.9 |
| MEDITERRANEAN | 0.7 | 0.8 | 0.9 | 1.0 | 1.5 | 1.5 | 1.5 | 1.3 | 1.0 | 0.2 | 1.0 | 0.1 | 0.2 | 0.4 | 0.3 |
| ATLANTIC | 2.2 | 1.5 | 4.2 | 3.1 | 2.4 | 4.7 | 15.1 | 11.8 | 16.7 | 13.2 | 11.9 | 22.8 | 15.9 | 10.1 | 8.6 |
| ANGOLA | 1.2 | 1.0 | 1.3 | 0.4 | 0.0 | 1.3 | 0.8 | 0.6 | 1.3 | 1.2 | 1.7 | 1.6 | 1.6 | 1.4 | 1.2 |
| GHANA | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 6.0 | 5.5 | 4.1 | 3.3 | 2.1 | 5.0 | 6.0 | 0.9 | 0.6 |
| SENEGAL | 0.0 | 0.0 | 0.4 | 1.1 | 0.7 | 1.5 | 1.4 | 1.7 | 2.7 | 2.3 | 3.4 | 5.9 | 5.2 | 4.2 | 4.4 |
| USSR | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.7 | 6.1 | 2.2 | 6.3 | 3.6 | 1.1 | 6.5 | 0.6 | 1.0 | 0.3 |
| OTHERS | 1.0 | 0.5 | 2.4 | 1.5 | 1.1 | 1.1 | 0.7 | 1.7 | 2.2 | 2.9 | 3.5 | 3.8 | 2.5 | 2.5 | 2.1 |
| FRIGATE TUNA (A. THAZARD) * | | | | | | | | | | | | | | | |
| ATLANTIC + MEDITERR. | 13.4 | 10.2 | 13.9 | 10.4 | 10.6 | 20.3 | 8.7 | 13.6 | 20.5 | 14.1 | 21.2 | 18.1 | 23.0 | 20.7 | 15.8 |
| MEDITERRANEAN | 3.3 | 3.5 | 4.3 | 2.5 | 4.1 | 3.7 | 3.9 | 4.7 | 3.5 | 2.9 | 3.3 | 3.7 | 4.0 | 3.5 | 3.2 |
| ITALY | 1.7 | 1.2 | 1.3 | 0.9 | 0.9 | 1.1 | 1.2 | 1.3 | 1.4 | 1.2 | 1.3 | 1.5 | 1.6 | 1.3 | 1.3 |
| ESPANA | 1.3 | 1.7 | 2.3 | 1.4 | 1.6 | 1.2 | 1.7 | 1.8 | 2.1 | 1.7 | 1.9 | 2.1 | 2.3 | 2.0 | 1.6 |
| OTHERS | 0.2 | 0.6 | 0.7 | 0.2 | 1.6 | 1.4 | 1.0 | 1.6 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.3 |
| ATLANTIC | 10.2 | 6.6 | 9.6 | 7.9 | 6.5 | 16.6 | 4.8 | 8.9 | 17.0 | 11.1 | 17.9 | 14.4 | 19.0 | 17.2 | 12.6 |
| GHANA | 5.3 | 1.6 | 6.3 | 6.0 | 4.3 | 13.9 | 1.0 | 4.3 | 7.6 | 2.0 | 6.1 | 5.6 | 4.5 | 4.5 | 3.3 |
| ESPANA *** | 0.5 | 0.6 | 0.2 | 0.3 | 0.4 | 0.6 | 1.2 | 1.2 | 6.3 | 5.3 | 3.1 | 2.7 | 5.7 | 3.7 | 3.2 |
| USSR | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.2 | 0.8 | 0.5 | 0.7 | 0.4 | 5.6 | 1.7 | 5.9 | 6.1 | 3.5 |
| VENEZUELA | 0.6 | 0.7 | 0.9 | 1.0 | 1.3 | 0.9 | 0.6 | 1.8 | 1.2 | 0.9 | 0.5 | 1.2 | 1.5 | 1.7 | 1.6 |
| OTHERS | 3.8 | 3.7 | 2.1 | 0.6 | 0.3 | 1.0 | 1.1 | 1.1 | 1.3 | 2.5 | 2.6 | 3.3 | 1.3 | 1.2 | 1.1 |
| SPOTTED SPANISH MACK. (S. MACULATUS) ** | | | | | | | | | | | | | | | |
| ATLANTIC | 16.8 | 20.0 | 21.0 | 18.1 | 14.6 | 15.4 | 15.0 | 14.6 | 18.1 | 15.0 | 16.4 | 14.0 | 13.8 | 14.8 | 16.2 |
| BRASIL | 2.8 | 4.4 | 6.3 | 2.7 | 0.3 | 1.0 | 1.5 | 1.2 | 1.4 | 1.5 | 1.1 | 1.2 | 1.8 | 1.5 | 0.0 |
| MEXICO | 5.3 | 6.7 | 5.2 | 4.8 | 3.4 | 4.4 | 5.1 | 5.8 | 5.9 | 5.9 | 7.8 | 5.9 | 5.8 | 5.8 | 5.9 |
| USA | 4.9 | 4.4 | 5.0 | 5.3 | 6.4 | 5.5 | 3.3 | 2.9 | 5.4 | 2.7 | 3.7 | 2.8 | 1.9 | 2.8 | 5.8 |
| VENEZUELA | 2.0 | 2.5 | 2.5 | 2.4 | 2.0 | 2.2 | 2.0 | 2.5 | 2.8 | 2.4 | 1.7 | 2.1 | 1.9 | 2.0 | 1.5 |
| OTHERS | 1.8 | 2.0 | 2.0 | 3.0 | 2.5 | 2.4 | 3.1 | 2.2 | 2.6 | 2.5 | 2.1 | 2.0 | 2.5 | 2.8 | 3.0 |

Table 23 (Cont.)

| | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KING MACKEREL (S. CAVALLA) | | | | | | | | | | | | | | | |
| ATLANTIC | 7.4 | 9.7 | 13.6 | 9.0 | 8.3 | 8.7 | 6.8 | 7.4 | 7.4 | 8.5 | 10.7 | 8.5 | 6.4 | 6.4 | 8.9 |
| MEXICO | 1.5 | 2.2 | 1.5 | 1.4 | 1.5 | 1.3 | 1.5 | 2.2 | 1.9 | 2.7 | 4.4 | 2.9 | 2.2 | 2.3 | 3.3 |
| USA | 2.2 | 2.7 | 4.7 | 3.1 | 4.1 | 3.8 | 2.5 | 2.2 | 3.2 | 3.4 | 3.7 | 3.0 | 2.4 | 2.4 | 5.6 |
| VENEZUELA | 1.1 | 1.5 | 2.2 | 2.4 | 1.7 | 1.6 | 1.3 | 2.0 | 1.4 | 1.6 | 1.9 | 1.9 | 0.9 | 0.8 | 0.0 |
| OTHERS | 2.5 | 3.3 | 5.2 | 2.2 | 1.0 | 1.9 | 1.4 | 0.9 | 0.9 | 0.9 | 0.7 | 0.7 | 0.9 | 0.8 | 0.0 |
| WEST AFRICAN SPAN. MACK. (S. TRITOR) | | | | | | | | | | | | | | | |
| ATLANTIC + MEDITERR. | 2.1 | 1.6 | 4.7 | 1.1 | 1.9 | 2.6 | 6.7 | 4.2 | 4.9 | 2.6 | 5.0 | 5.1 | 4.2 | 4.4 | 3.2 |
| MEDITERRANEAN | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| ATLANTIC | 2.1 | 1.6 | 4.7 | 1.1 | 1.9 | 2.6 | 6.7 | 4.2 | 4.9 | 2.6 | 5.0 | 5.1 | 4.2 | 4.4 | 3.2 |
| GHANA | 1.5 | 1.0 | 3.5 | 0.6 | 0.6 | 0.7 | 0.8 | 1.6 | 4.4 | 2.0 | 3.0 | 2.2 | 3.0 | 3.0 | 1.5 |
| SENEGAL | 0.0 | 0.0 | 0.1 | 0.3 | 1.3 | 1.2 | 1.1 | 1.1 | 0.4 | 0.5 | 0.3 | 1.1 | 0.9 | 1.1 | 1.4 |
| USSR | 0.6 | 0.6 | 0.8 | 0.2 | 0.1 | 0.6 | 4.8 | 1.4 | 0.0 | 0.0 | 0.6 | 1.2 | 0.2 | 0.2 | 0.2 |
| OTHERS | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.1 | 1.1 | 0.6 | 0.1 | 0.1 | 0.1 |
| BLACKFIN TUNA (T. ATLANTICUS) | | | | | | | | | | | | | | | |
| ATLANTIC | 1.9 | 0.9 | 1.1 | 0.8 | 1.0 | 1.2 | 1.3 | 1.2 | 1.2 | 2.0 | 1.9 | 1.7 | 1.9 | 1.4 | 1.9 |
| WAHOO (A. SOLANDRI) | | | | | | | | | | | | | | | |
| ATLANTIC + MEDITERR. | 0.4 | 0.3 | 0.4 | 0.3 | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 | 2.8 | 2.1 | 2.1 | 2.0 | 0.8 | 0.7 |
| MEDITERRANEAN | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| ATLANTIC | 0.4 | 0.3 | 0.4 | 0.3 | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 | 2.8 | 2.1 | 2.1 | 2.0 | 0.8 | 0.7 |
| CAP VERT | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.3 | 1.5 | 1.6 | 1.4 | 0.1 | 0.2 |
| OTHERS | 0.4 | 0.3 | 0.4 | 0.3 | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.6 | 0.6 | 0.6 | 0.6 | 0.5 |
| CERO (S. REGALIS) | | | | | | | | | | | | | | | |
| ATLANTIC | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| SCOMBEROMORUS UNCLASSIFIED (S. SPP.) | | | | | | | | | | | | | | | |
| ATLANTIC + MEDITERR. | 1.0 | 1.2 | 1.0 | 1.3 | 1.0 | 1.0 | 1.0 | 0.9 | 0.8 | 1.0 | 1.1 | 1.0 | 1.5 | 0.8 | 1.9 |
| MEDITERRANEAN | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| ATLANTIC | 1.0 | 1.2 | 1.0 | 1.3 | 1.0 | 1.0 | 1.0 | 0.9 | 0.8 | 1.0 | 1.1 | 1.0 | 1.5 | 0.8 | 1.9 |
| PLAIN BONITO (O. UNICOLOR) | | | | | | | | | | | | | | | |
| ATLANTIC + MEDITERR. | 0.3 | 0.1 | 0.2 | 0.1 | 0.2 | 0.5 | 1.0 | 0.5 | 0.7 | 1.4 | 0.6 | 0.0 | 0.0 | 0.1 | 0.1 |
| MEDITERRANEAN | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| ATLANTIC | 0.3 | 0.1 | 0.1 | 0.1 | 0.2 | 0.3 | 0.8 | 0.5 | 0.7 | 1.4 | 0.6 | 0.0 | 0.0 | 0.1 | 0.1 |
| MAURITANIE | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.5 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 |
| MAROC | 0.2 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | 0.7 | 0.4 | 0.6 | 1.0 | 0.5 | 0.0 | 0.0 | 0.1 | 0.0 |
| OTHERS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| OTHERS | | | | | | | | | | | | | | | |
| ATLANTIC + MEDITERR. | 16.2 | 8.0 | 8.3 | 13.2 | 10.8 | 12.5 | 8.3 | 7.6 | 9.8 | 8.3 | 9.4 | 7.6 | 6.3 | 6.5 | 9.4 |
| MEDITERRANEAN | 0.5 | 0.4 | 0.4 | 0.8 | 0.5 | 0.5 | 0.4 | 0.3 | 2.0 | 1.5 | 1.8 | 1.4 | 1.4 | 2.1 | 2.1 |
| ATLANTIC | 15.6 | 7.5 | 7.9 | 12.4 | 10.3 | 12.1 | 7.9 | 7.4 | 7.8 | 6.8 | 7.6 | 6.2 | 4.8 | 4.4 | 7.3 |

*Includes bullet tuna (A. rochei).
**Includes serra Spanish mackerel (S. brasiliensis).
***Includes Atlantic black skipjack 1978-84.
Note: Table adopted at the SCRS included some errors which have been removed.

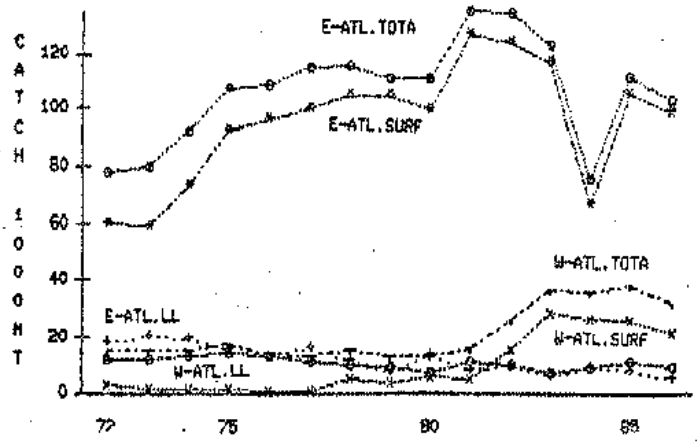


Fig. 1. Yellowfin tuna catch in the east and west Atlantic by longline and surface (baitboat and purse seine).

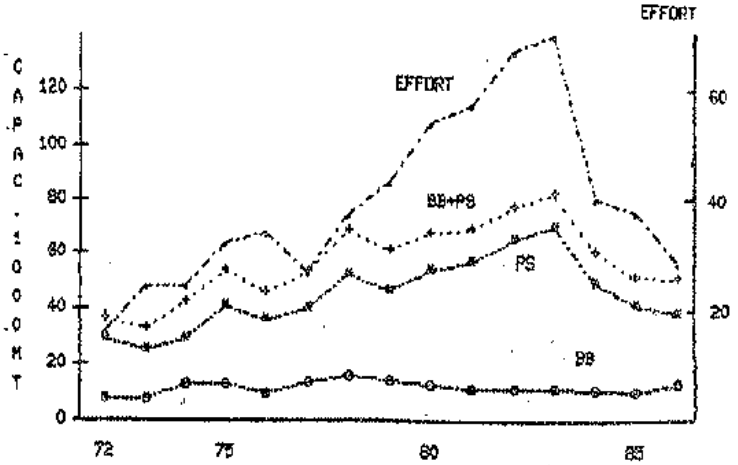


Fig. 2. Trends in carrying capacity and effective effort of eastern Atlantic surface fleets.

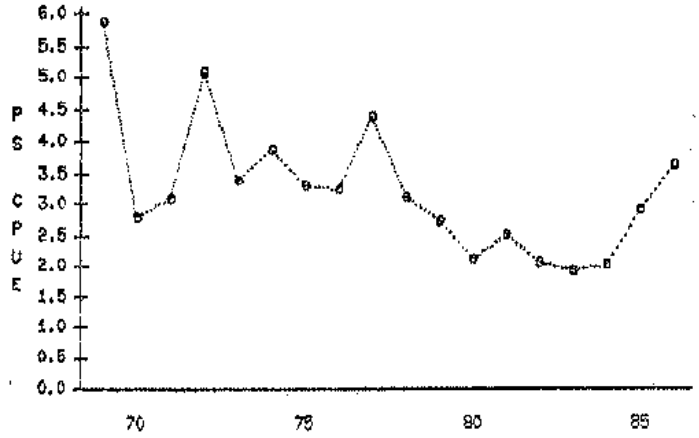


Fig. 3. Yellowfin abundance index by purse seine.

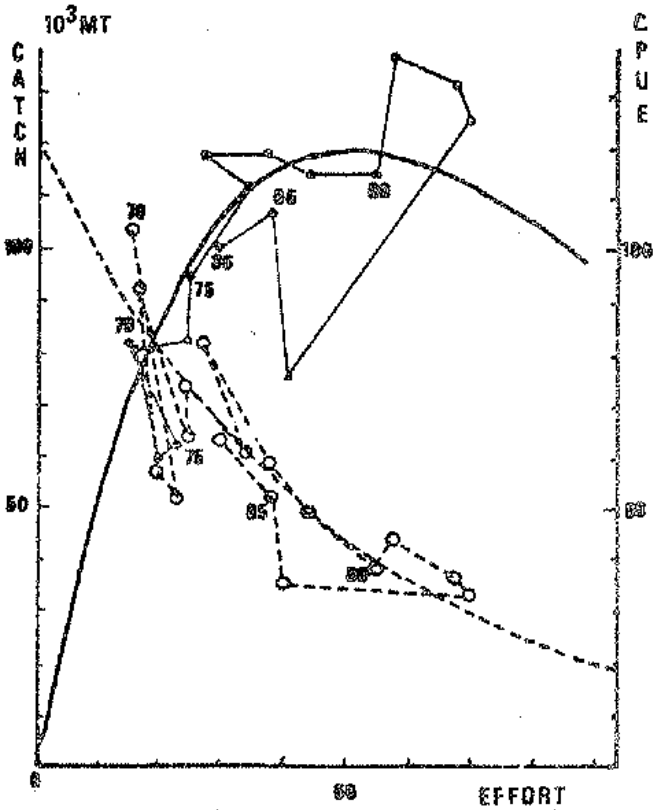


Fig. 4. Production model fitted for east Atlantic yellowfin tuna.

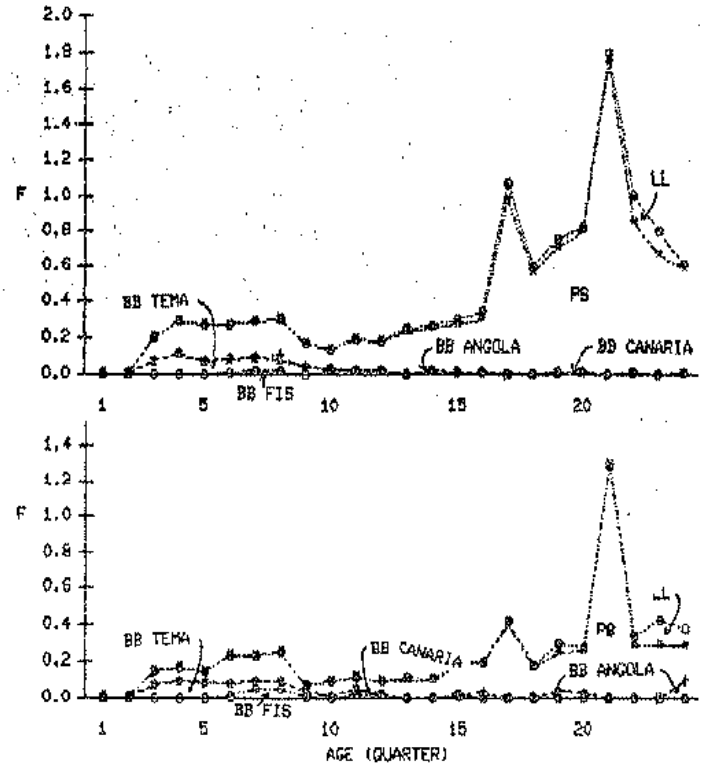


Fig. 5. Fishing mortalities by age of yellowfin tuna and by several gears for two reference periods.

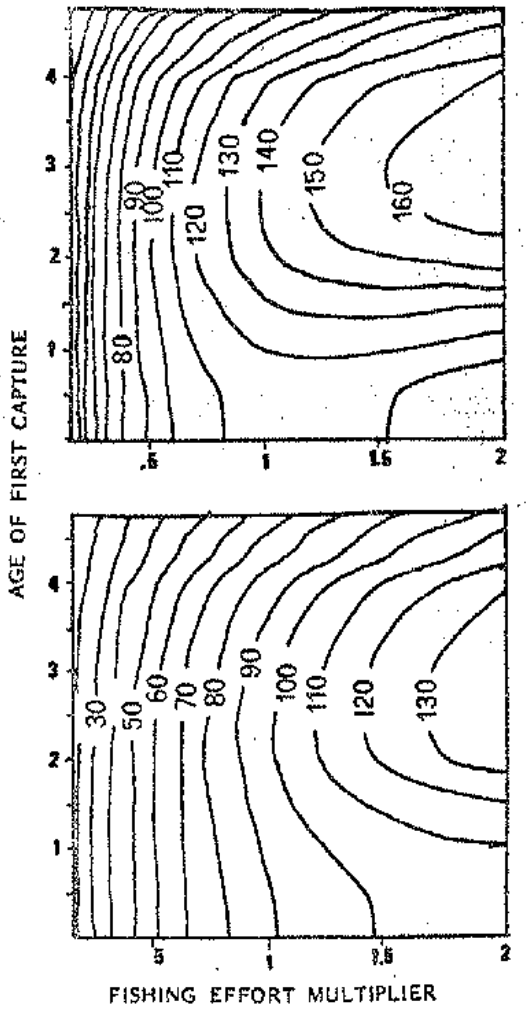


Fig. 6. Yellowfin yield-per-recruit isopleths for two reference periods.

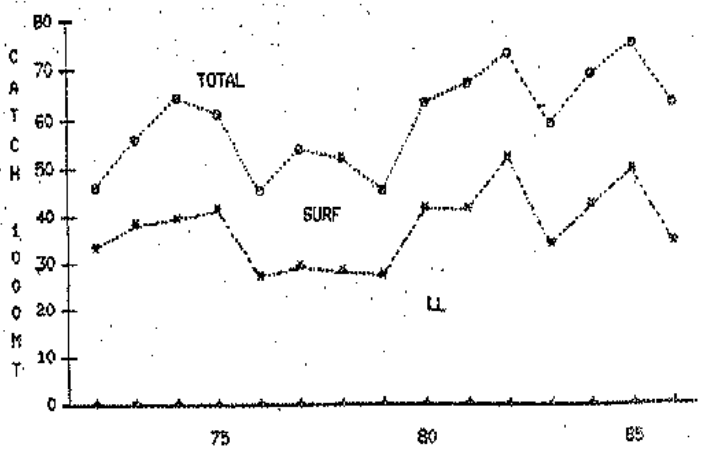


Fig. 7. Bigeye tuna catches by surface and longline fisheries, 1972-86.

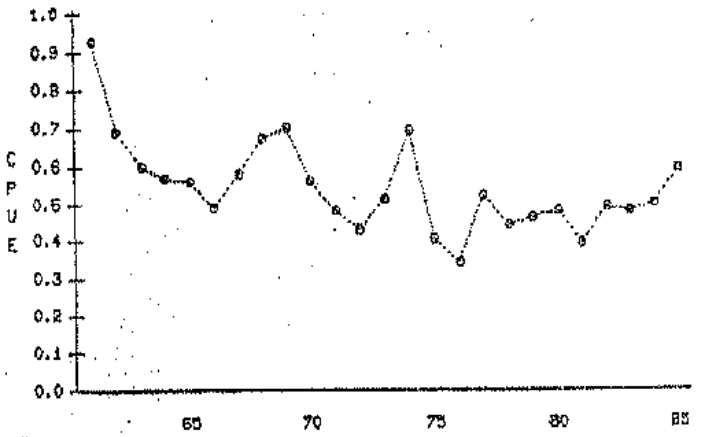


Fig. 8. Bigeye CPUE of Japanese longline fishery, whole Atlantic, 1961-85.

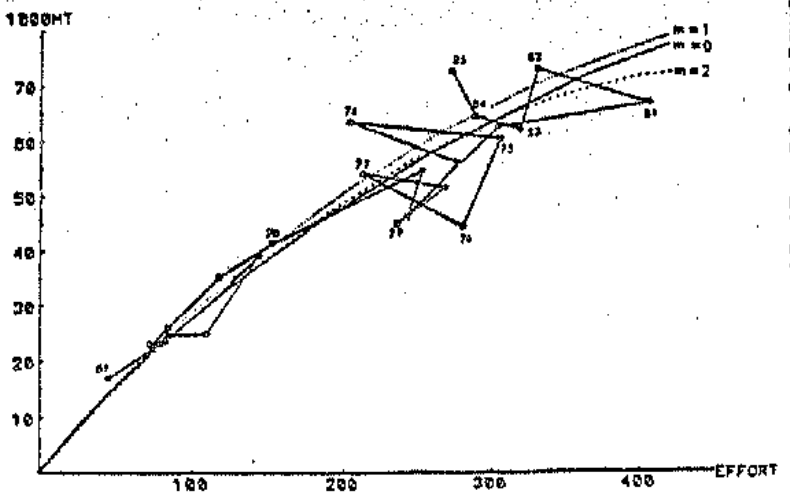


Fig. 9. Production model yield curve fitted for bigeye tuna in the whole Atlantic, 1961-85.

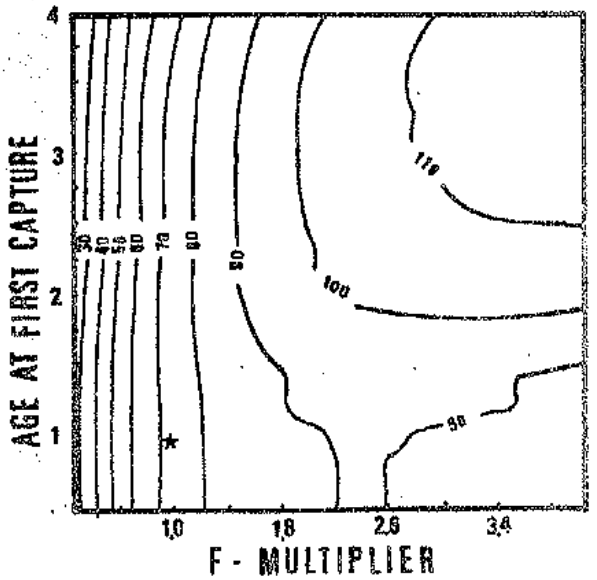


Fig. 10. Bigeye yield-per-recruit isopleth in 1984. * = present position. X-axis is the F multiplier and Y-axis is age at first capture. (Presented at the 1986 SCRS.)

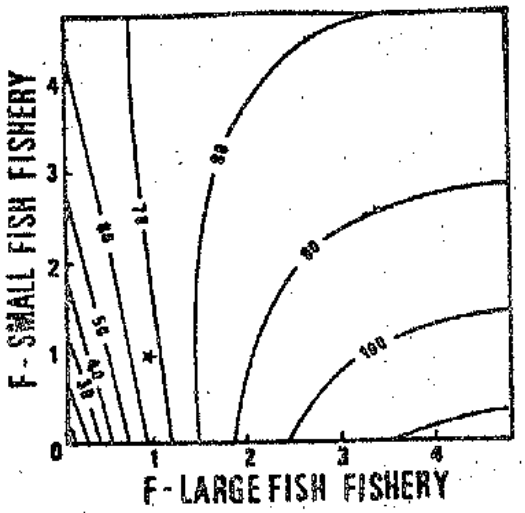


Fig. 11. Isopleth of multi-gear yield-per-recruit analyses on bigeye tuna. * = present position. (Presented at 1986 SCRS).

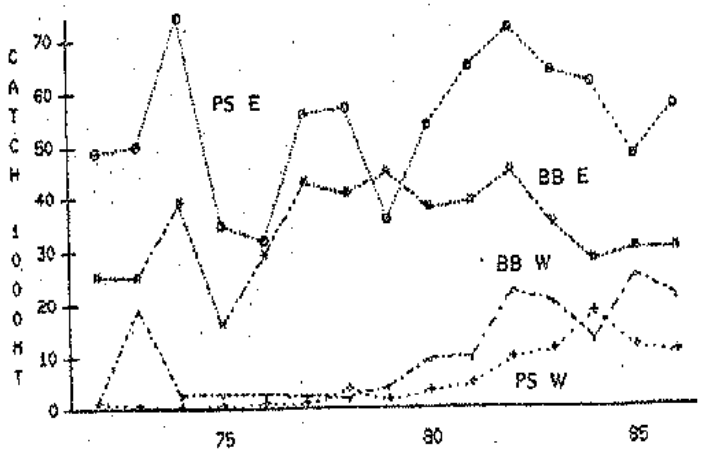


Fig. 12. Skipjack catches by gear for east and west Atlantic, 1972-86.

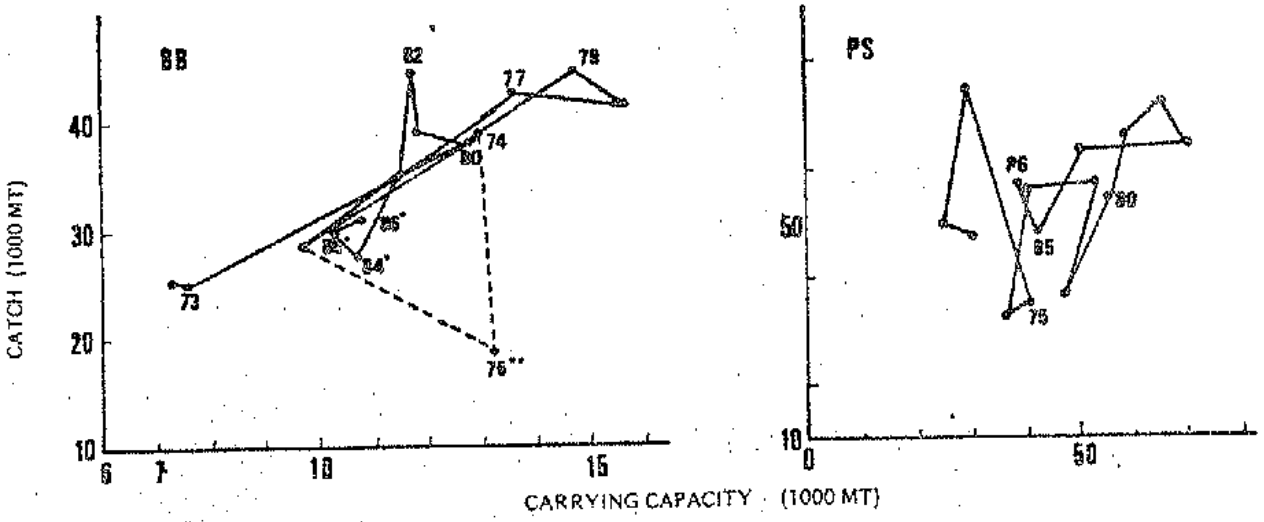


Fig. 13. Relation between skipjack catches and carrying capacity of baitboats and purse seiners in the east Atlantic. (* = catch estimated based on Abidjan port sampling; ** = year of low fishing activity caused by non-fishery factors.)

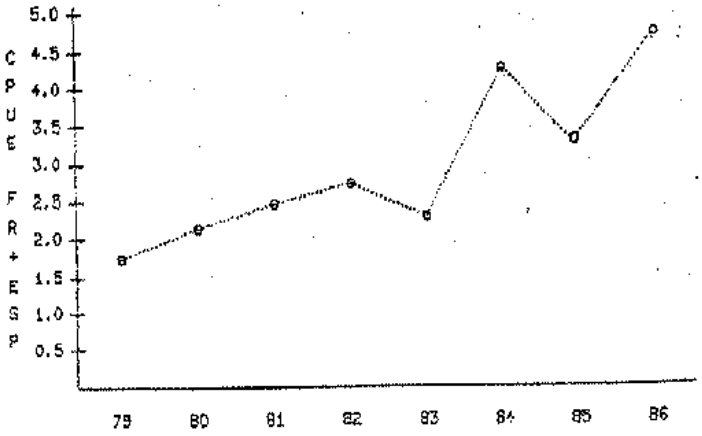


Fig. 14. Skipjack CPUE (catch/days fishing per year) of purse seiners in the east Atlantic.

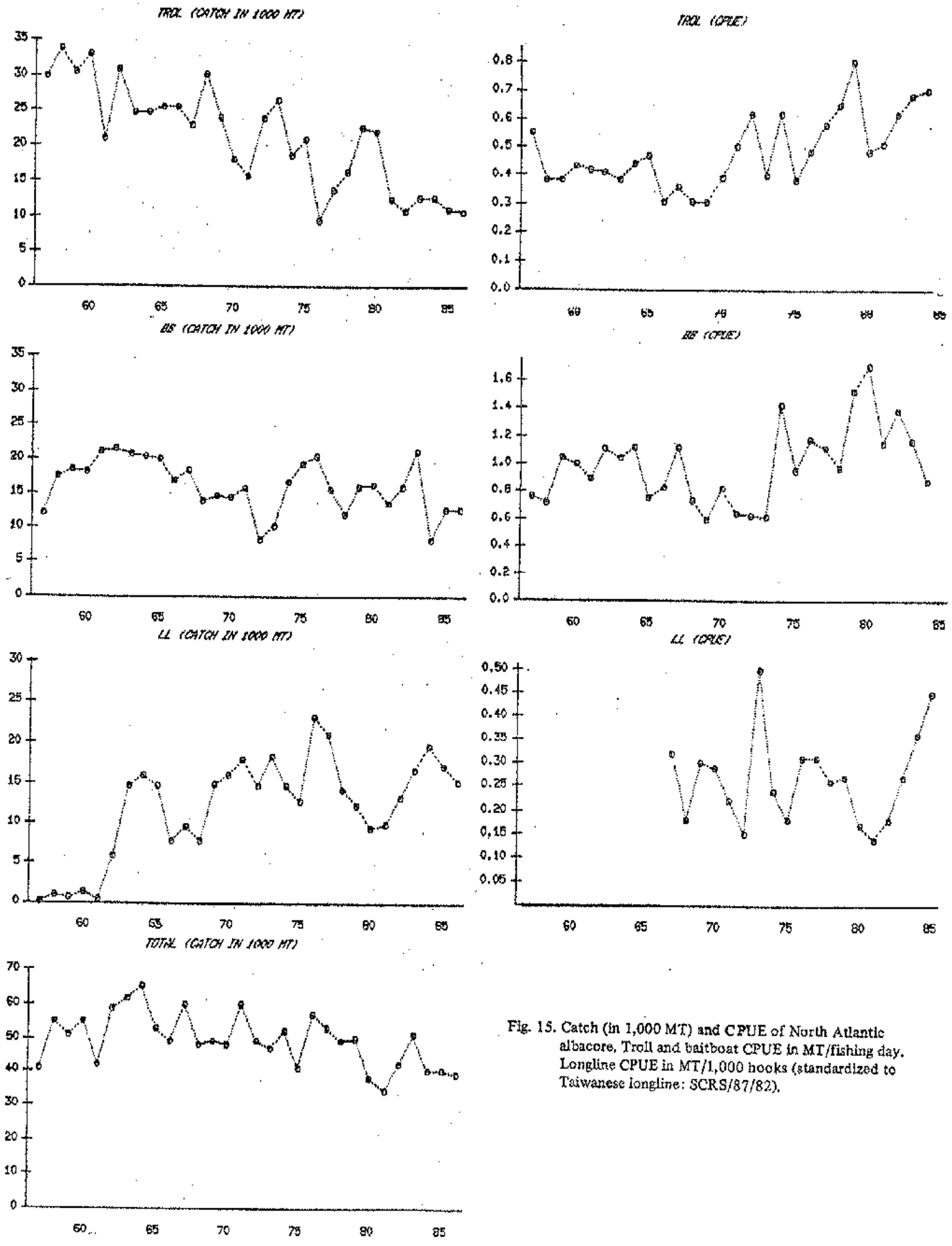


Fig. 15. Catch (in 1,000 MT) and CPUE of North Atlantic albacore, Troll and baitboat CPUE in MT/fishing day. Longline CPUE in MT/1,000 hooks (standardized to Taiwanese longline: SCRS/87/82).

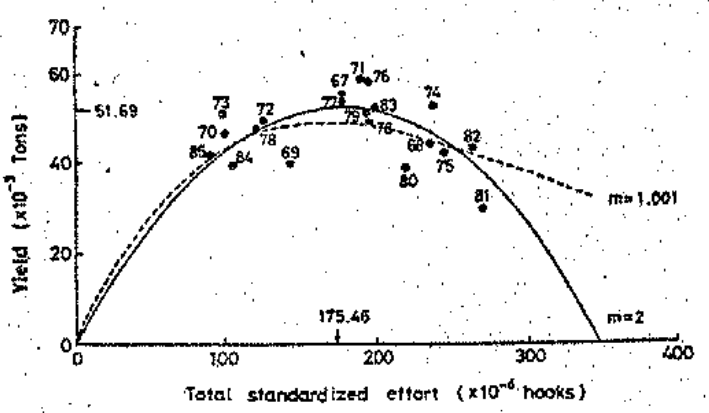


Fig. 16. Production model fitted to North Atlantic albacore fishery. Standardized effort in million hooks. (SCRS/87/82)

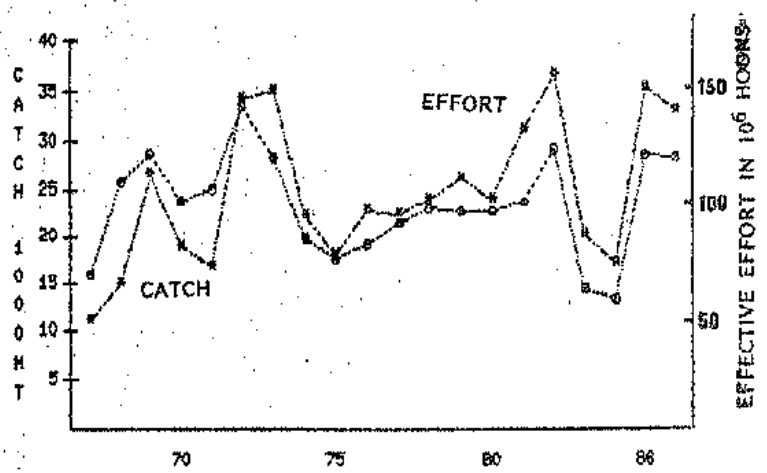


Fig. 17. South Atlantic albacore catches and effective effort (in million hooks) of all gears combined. 1986 data preliminary. (SCRS/87/81)

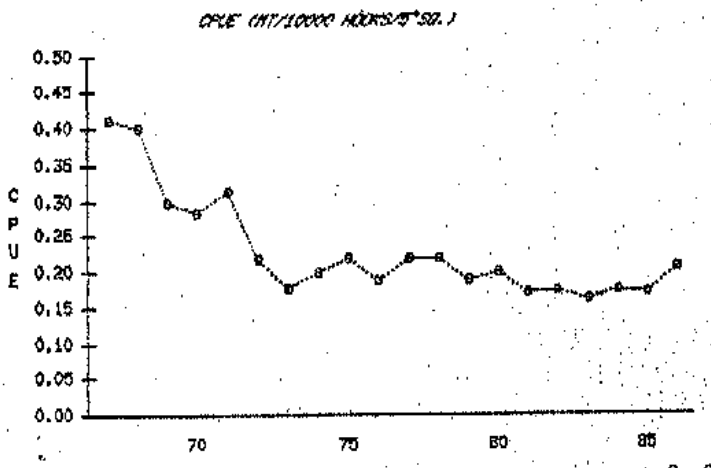


Fig. 18. South Atlantic albacore CPUE (in MT/1,000 hooks per 5°x5° area), 1967-86. (SCRS/87/81)

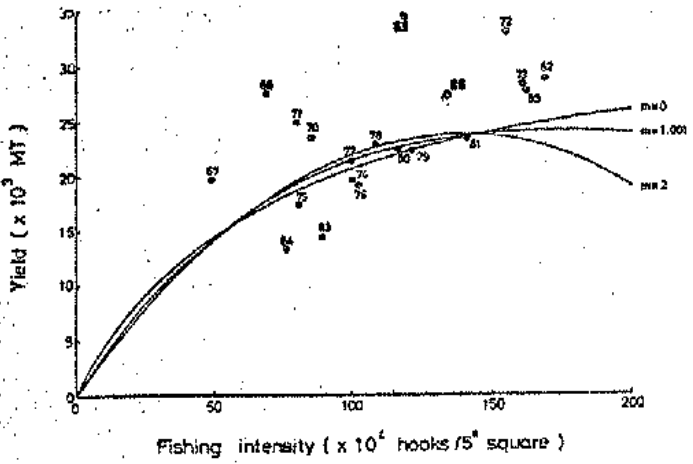


Fig. 19. Production model fitted to South Atlantic albacore fishery, assuming three significant year-classes in the catch. 1986 point is provisional.

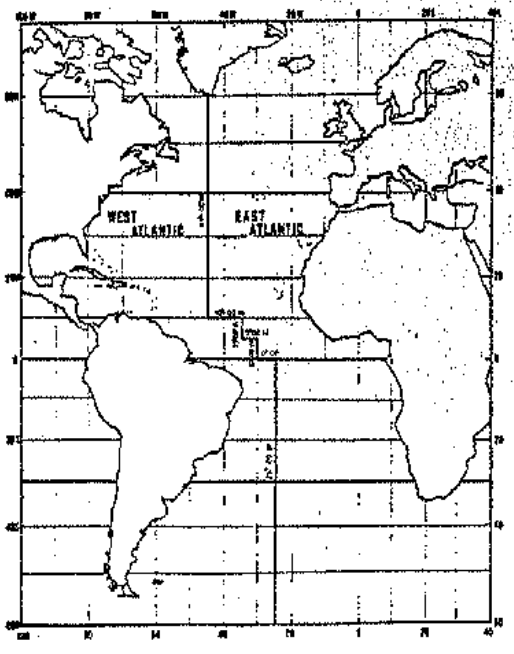


Fig. 20. Division lines between east and west Atlantic bluefin tuna stocks.

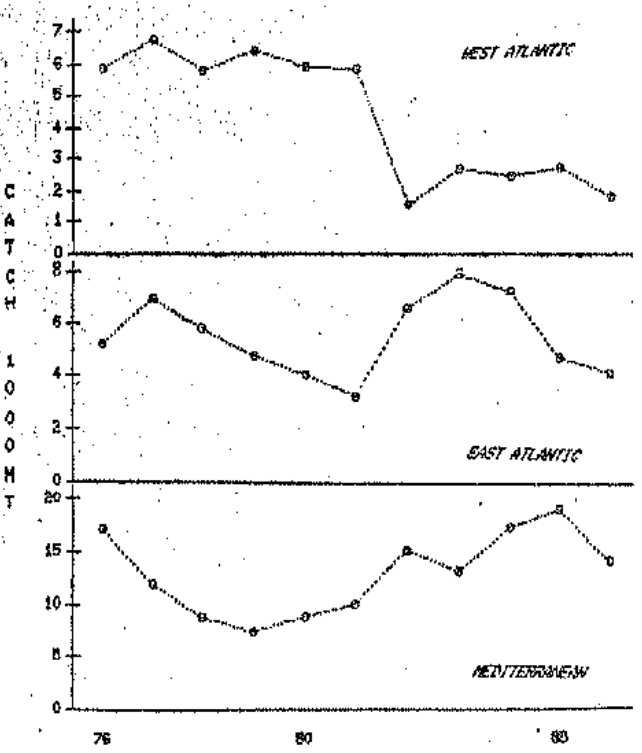


Fig. 21 Bluefin catch by west and east Atlantic and Mediterranean Sea.

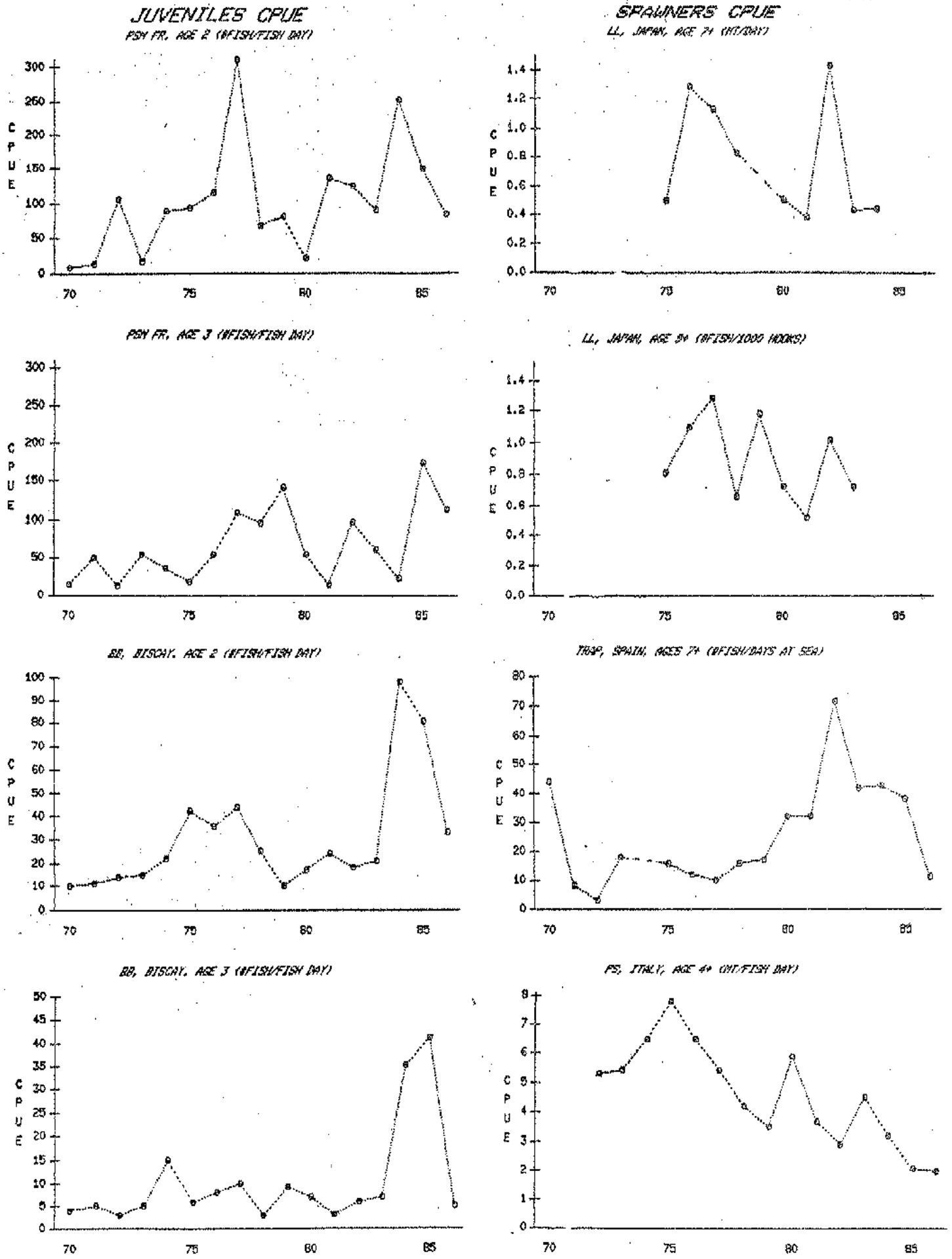


Fig. 22. Bluefin CPUE series (four for large fish and four for small fish) for east Atlantic and Mediterranean Sea.

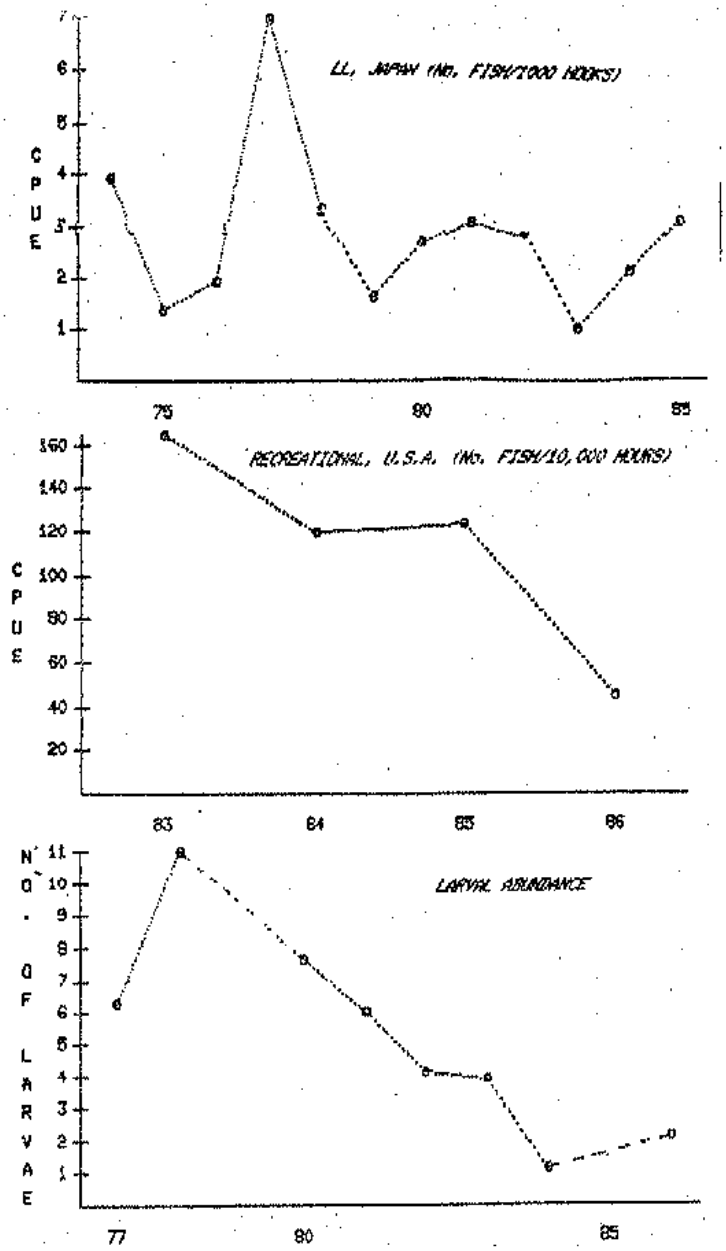


Fig. 23. Abundance indices for bluefin tuna used in calibrating the final VPA (1987 SCRS). Japanese LL CPUE were used for age 3-6; larval abundance and U.S. R&R and HAND catch rates were used for ages 10-30.

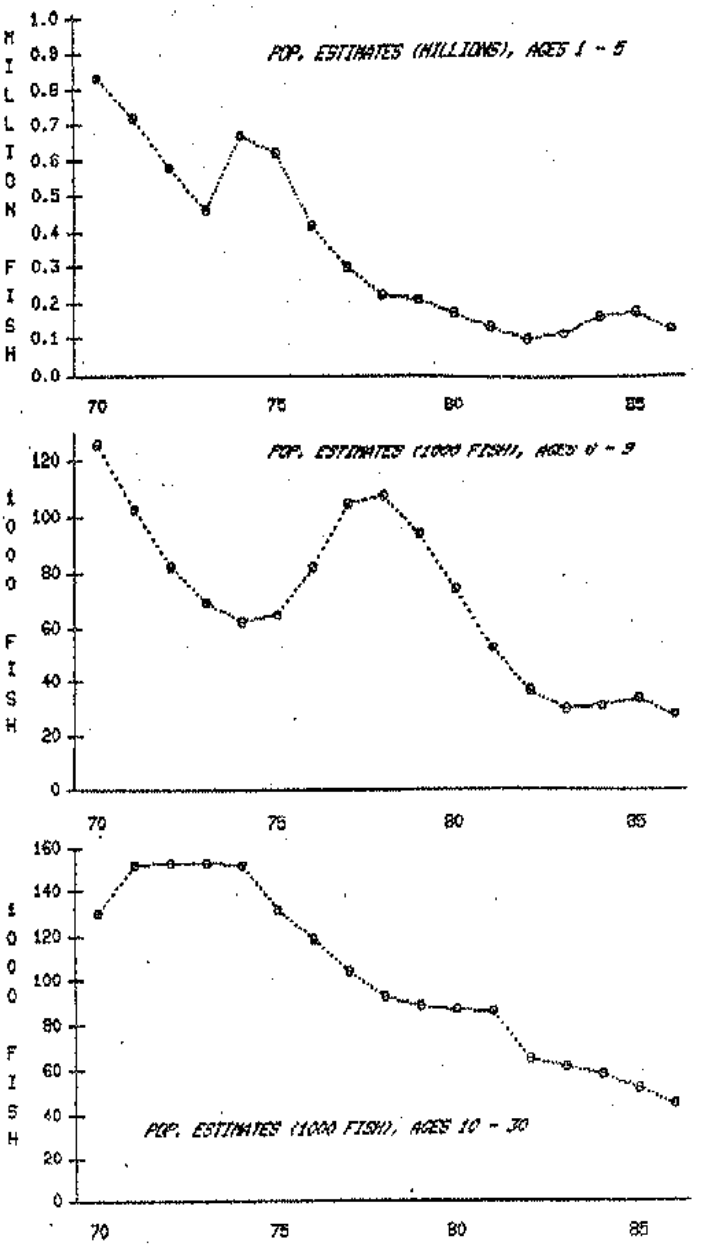


Fig. 24. Estimates of west Atlantic bluefin population size from VPA conducted by SCRS in 1987.

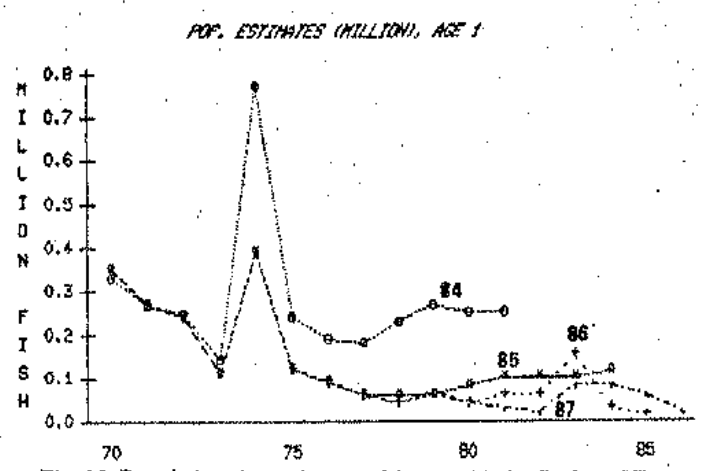


Fig. 25. Population size estimates of 1-year-old bluefin from VPA conducted by SCRS in 1984-1987.

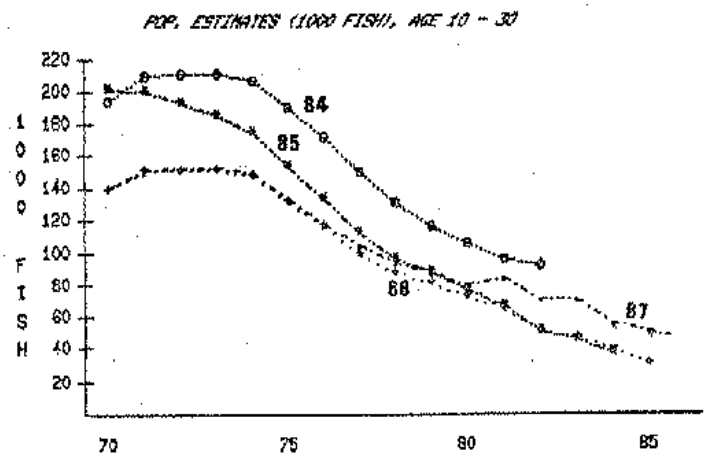


Fig. 26. Population size estimates of 10-30-year-old bluefin from VPA conducted by SCRS in 1984-1987.

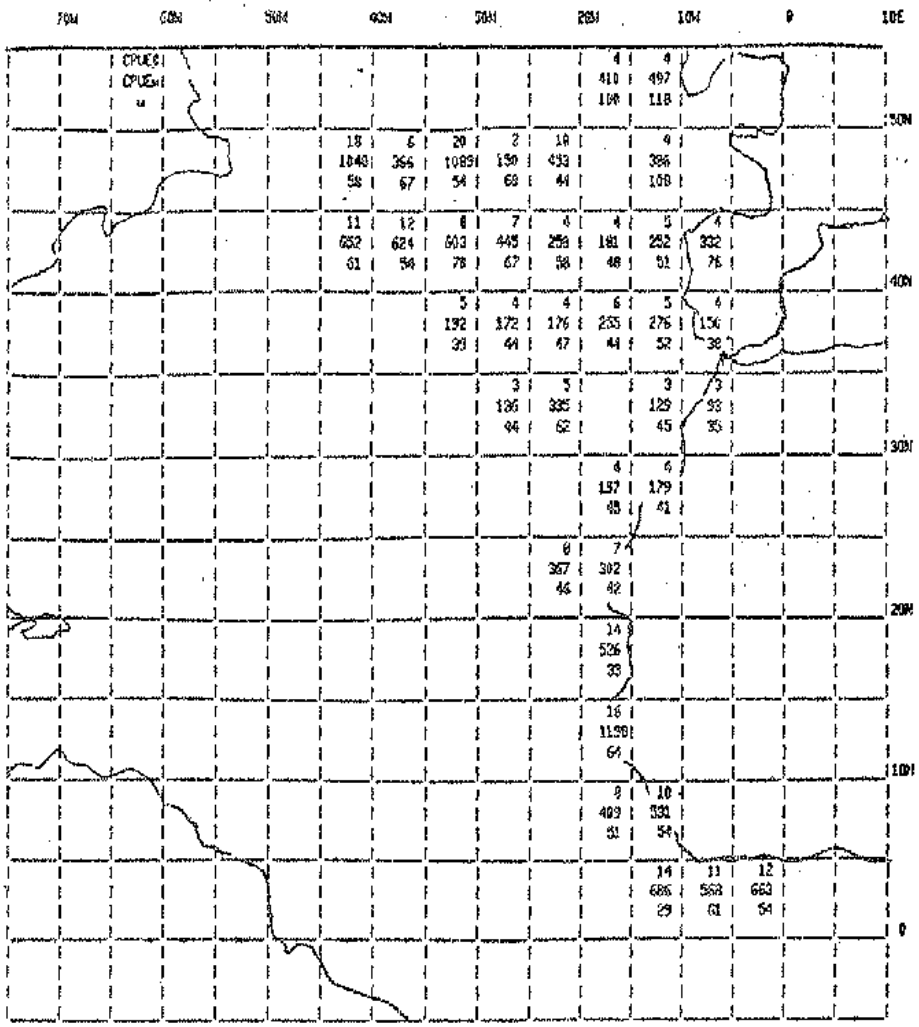

Fig. 27. Annual CPUE in number (top figures), CPUE in weight (middle figures) and catch in weight (bottom figures) for swordfish fleet, 1985.

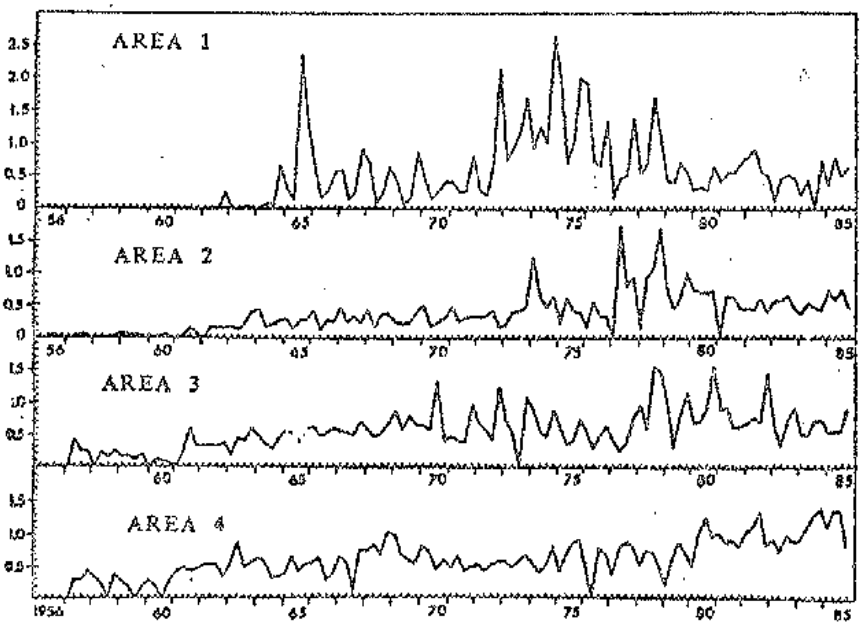


Fig. 28. Trends in hook rates for Atlantic swordfish by area (see Fig. 29) and by quarter of the year.

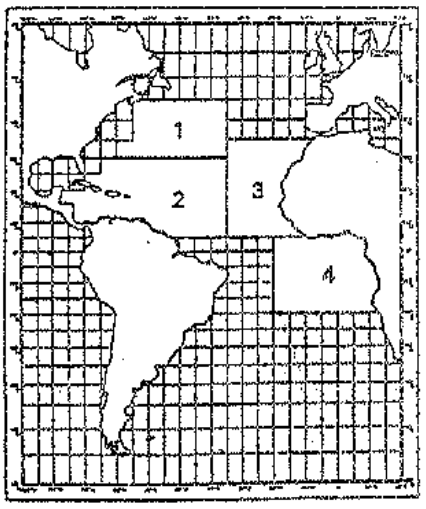


Fig. 29. Areas used in modal analyses and CPUE analyses of swordfish.

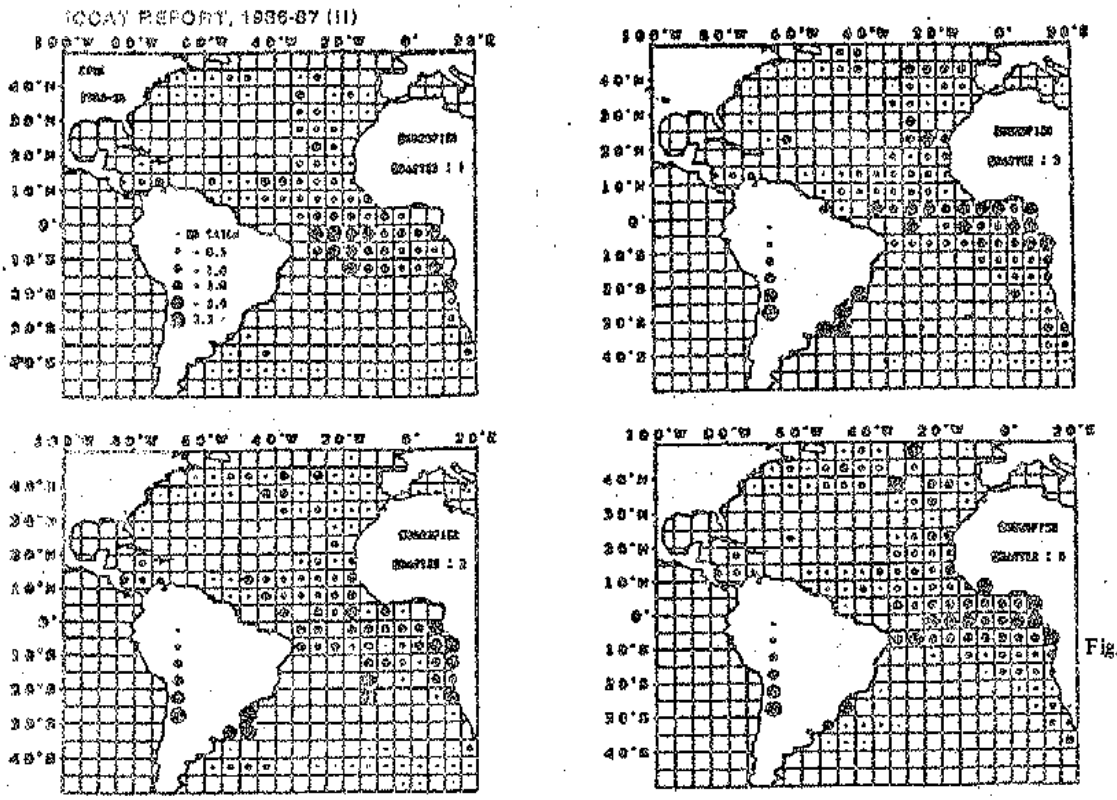

Fig. 30. Quarterly distribution of average hook rates (number of fish per 1,000 hooks) for swordfish by Japanese longliners, 1983-85.

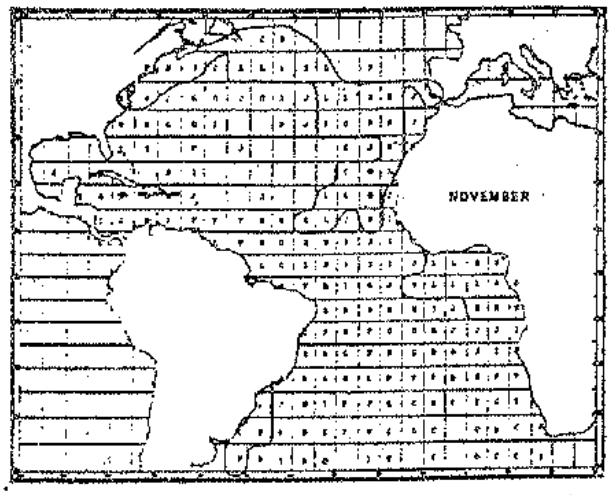


Fig. 31. Average November CPUE of swordfish by Japanese longline (scaled by the transformation 3 Ln (CPUE 1)). Contours represent "K" which corresponds to .8 to 3 fish per 1,000 hooks.

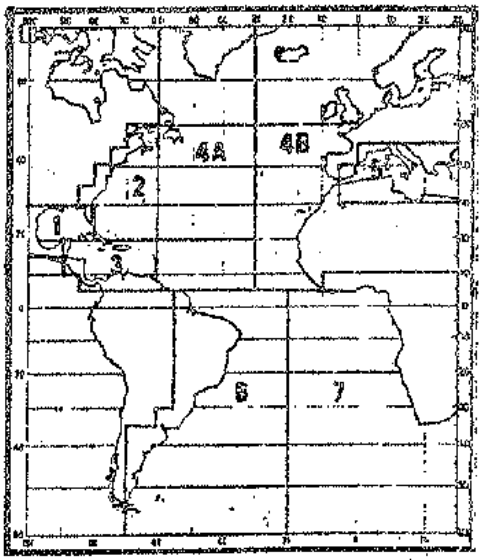


Fig. 33. Swordfish areas agreed upon by Workshop members for initial data preparation.

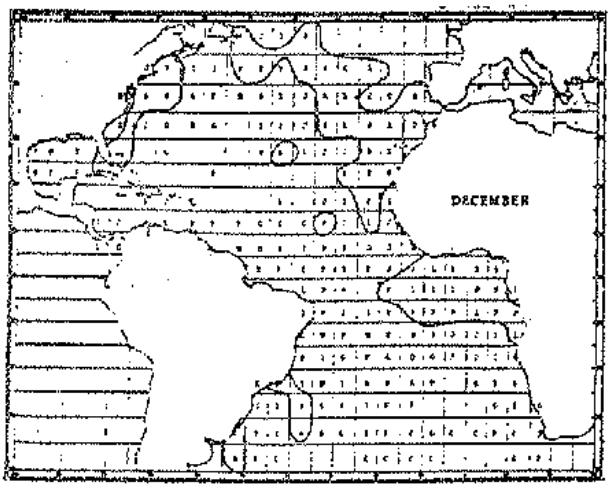


Fig. 32. Average December CPUE of swordfish by Japanese longline (scaled by the transformation 3 Ln (CPUE 1)). Contours represent "K" which corresponds to .8 to 3 fish per 1,000 hooks.

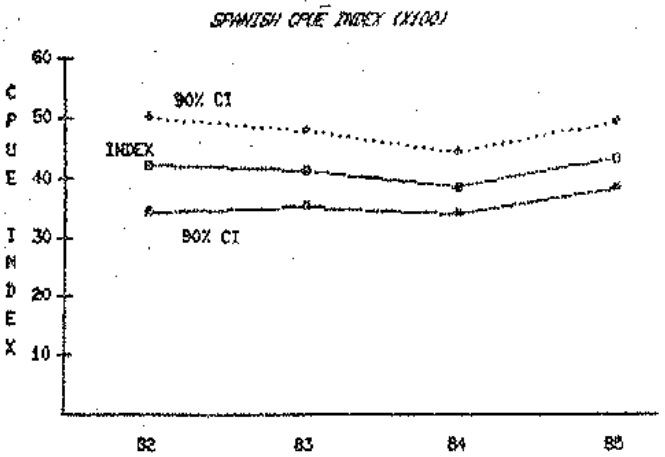


Fig. 34. Spanish standardized CPUE index with year, area, quarter and area-quarter interactions.

## 1987 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. Report of the Swordfish Workshop
8. Report of the Working Group on Juvenile Multi-species Statistics
9. Review of conditions of stocks:

   Tropical tunas: YFT-Yellowfin, BET-Bigeye, SKJ-Skipjack
   ALB-Albacore
   BFT-Bluefin
   BIL-Billfishes
   SWO-Swordfish
   SBF-Southern Bluefin
   SMT-Small Tunas
   MLT-Multi-species: Tropical and Temperate

10. Review of the progress made by the Yellowfin Year Program
11. Review of the progress made by the Program of Enhanced Research for Billfish
12. Report of the Sub-Committee on Statistics and review of Atlantic tuna statistics and data management system:

    a) National statistics and Secretariat reporting
    b) Review of tropical tuna statistics
    c) Review of billfish (including swordfish) statistics
    d) Coordinating Working Party for Tuna Statistics and comparison of tuna data bases between agencies
    e) Biostatistical studies
    f) Review of Secretariat computer usage
    g) Vessel registrations for global tuna fleet data base
    h) Proposal for change of English common name of "Little tunny"
    i) Others

13. Review of editorial and publication policy
14. Review of future SCRS research programs and consideration of SCRS meeting procedures
15. Cooperation with other organizations
16. Recommendations
17. Other matters
18. Adoption of Report
19. Adjournment

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## List of Documents

### 1987 SCRS Meeting

| | |
|---|---|
| SCRS/87/1 | 1987 Tentative SCRS Agenda - Secretariat |
| SCRS/87/2 | 1987 Annotated Tentative Agenda - Secretariat |
| SCRS/87/3 | 1987 Tentative Time Schedule - Secretariat |
| SCRS/87/4 | 1987 Tentative Agenda of the Sub-Committee on Statistics-- Revision 1 - Secretariat |
| SCRS/87/5 | Organization of the 1987 SCRS Meeting - Secretariat |
| SCRS/87/6 | SCRS Document Policy - Secretariat |
| SCRS/87/7 | Report of the Meeting of the Yellowfin Year Program Activity Team Leaders |
| SCRS/87/8 | Report of the Meeting of the Working Group on Juvenile Multi-species Statistics |
| SCRS/87/9 | Proposal for the Change of the English Name of Euthynnus alletteratus - Assistant Executive Secretary |
| SCRS/87/10 | Proposition for Creating Tuna Fishing Boat Register - Assistant Executive Secretary |
| SCRS/87/11 | Secretariat processing of data received from Venezuela - P. M. Miyake, P. Kebe |
| SCRS/87/12 | Report of the Thirteenth Session of the Coordinating Working Party on Atlantic Fishery Statistics (CWP) - FAO |
| SCRS/87/13 | Secretariat Report on Statistics and Coordination of Research - Secretariat |
| SCRS/87/14 | Program Plan for the Enhanced Research for Billfish for 1987 |
| SCRS/87/15 | Report of the ICCAT Swordfish Workshop |
| SCRS/87/16 | Report of the Ad Hoc Consultation on Global Tuna Statistics |
| SCRS/87/17 | Data preparations for Swordfish Workshop - P. M. Miyake, J. C. Rey, D. Da Rodda |

SCRS/87/18 Progress of the ICCAT Enhanced Research Program for Billfish during 1987 - B. E. Brown, E. Prince, P. M. Miyake

SCRS/87/19 Table of data availability and proposed substitutions for bluefin - Secretariat

SCRS/87/20 Pêcherie de l'espadon au Maroc - A. El Hannach

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SCRS/87/22 Aspectos biológicos de los peces de pico en la región noroccidental de Cuba - L. Espinosa, M. Sosa, S. Moreno, R. Quevedo

SCRS/87/23 Ordenamiento de la pesquería con palangre en la costa norte de La Habana y Matanzas, Cuba - A. Olaechea, M. Sosa, P. Salahange, R. Quevedo

SCRS/87/24 Análisis de la abundancia (1973-1985) de grandes peces pelágicos en la zona oceánica del Atlántico tropical-oriental - A. Rodríguez Rodríguez, S. F. Nieto Misas, L. Muñoz Uribarre

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SCRS/87/33 Comentarios sobre las areas de reproducción del pez espada, Xiphias gladius, en el Atlántico y Mediterráneo - J. C. Rey

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SCRS/87/38 A note on Japanese longline fisheries in the Atlantic Ocean - M. Yao

SCRS/87/39 Simulation study for appraising the validity of Parrack's VPA tuning method - T. Nagai, N. Miyabe

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SCRS/87/51 Updated comments on Parrack's VPA tuning procedure - T. Nagai

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SCRS/87/53 An updated production model analysis on Atlantic bigeye tuna - M. Miyabe, M. Kiyota, S. Kume

SCRS/87/54 A note on Japanese longline size data for yellowfin tuna for the years 1955-1964 - T. Koido

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SCRS/87/59 Catch rates in the Canadian Atlantic bluefin fishery - D. Clay

SCRS/87/60 A review of age and growth of Canadian giant bluefin as estimated from otoliths - T. Hurlbut, D. Clay

SCRS/87/61 Fat, water, protein and ash composition of bluefin tuna collected in the Gulf of St. Lawrence - D. Clay

SCRS/87/62 Gráficos de CPUE y peso medio por cuadrícula 5x5 grados de la flota española de pez espada, Xiphias gladius, años 1982-1985 - J. Mejuto, A. González-Garcés

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SCRS/87/81 Stock assessment of South Atlantic albacore by using production model analysis, 1967-1986 - S. Y. Yeh, H. C. Liu

SCRS/87/82 An overview of fishery trend and catch distribution of the North Atlantic albacore by Taiwanese longliners - C. C. Hsu, H. C. Liu

SCRS/87/83 Description of the Brazilian swordfish fishery, in Santos - C. A. Arfelli, A. Ferreira de Amorim

SCRS/87/84 Note sur la pêche sportive du makaire bleu aux Açores - J. Pereira

SCRS/87/85 La pêcherie de l'espadon aux Açores - J. Pereira

SCRS/87/86 Instalación de un sistema de bitácoras para la pesca atunera de superficie en Venezuela y análisis de los primeros resultados - D. Gaertner, M. Gaertner-Medina, C. Castillo, L. Martínez

SCRS/87/87 Observaciones sobre los lances realizados por los cerqueros venezolanos - D. Gaertner, M. Gaertner-Medina

SCRS/87/88 Informe nacional de España

# Report of the Meeting of the Yellowfin Year Program Activity Team Leaders
(Dakar, Senegal, June, 1987)

The Yellowfin Year Program (YYP) Activity Team Leaders met on June 3, 1987, in Dakar at the time of the Meeting of the Working Group on Juvenile Multi-species Statistics, to discuss the current status of the Program.

The following Team Leaders were present: Dr. A. Fonteneau (General Coordinator), Mr. J. Ariz (Observer Program), Dr. F. X. Bard (Tagging), and Mr. R. Conser (Data Management). Mr. A. González Garcés (SCRS Chairman), Dr. P. M. Miyake (ICCAT Assistant Executive Secretary) and some other scientists also attended. (The List of Participants is attached as Addendum 1).

## 1. Analysis of the statistics of the fishery

This item is not really considered as one of the YYP activities, but instead it corresponds to the matters to be reviewed by the SCRS Sub-Committee on Statistics. However, the Group agreed that, in general, the current statistics are sufficiently good for the east Atlantic, and those for the west Atlantic are starting to show some improvement, especially for Venezuela.

## 2. Observer Program

As regards purse seiners, two observer cruises have been carried out up to now by the FIS fleet: one in 1986 and another in 1987. Spanish purse seiners have conducted four cruises: two in 1986 and two in the first quarter of 1987.

Observer activities took place in conjunction with opportunistic tagging on Ghanaian baitboats, in accordance with the YYP Program Plan. The quality of these data seems inferior to data obtained aboard purse seiners, due for the most part to the difficulties involved with this work on baitboats. Three cruises of this type were conducted.

In the west Atlantic three observer cruises were carried out: two on Venezuelan baitboats in conjunction with tagging, and one on a Venezuelan purse seiner.

## 3. Tagging Program

Tagging activities carried out (up to November, 1986) are described in SCRS/86/28. The number of fish tagged reached 1,963 yellowfin and 1,022 fish of other species.

In 1987, the R/V "Nizery" conducted two cruises in which 407 fish were tagged. Opportunistic tagging on Ghanaian baitboats in 1987 was equally poor (about 300 yellowfin and bigeye were tagged on two cruises). Because of these poor results, it was decided that tagging in the east Atlantic would be suspended. However, the "Nizery", under the responsibility of France and Venezuela, will carry out two yellowfin tagging cruises in the west Atlantic after June, 1987.

Two opportunistic tagging cruises on Venezuelan baitboats were carried out in the west Atlantic. The results seem to be poor.

The recapture rates of tunas tagged in the east Atlantic have been variable (Table 1). The rate can be considered acceptable for the tagging by the "Nizery", whereas it is very low for the opportunistic tagging. The reason for this very low recapture rate is not very clear. It is due, most likely, to the high immediate mortality rate after the fish were returned to the water. This low rate for opportunistic tag recoveries seems to contradict the results of the tagging carried out on similar baitboats in 1980 and 1981 within the International Skipjack Year Program.

## 4. Data Management

The Data Management Team Leader was asked to prepare, by correspondence, a Data Management Meeting which should be held in October during the 1987 SCRS Meeting.

This Activity Team should propose the type of processing which will be applied to the data from the Yellowfin Year Program activities (for example, how to compare the data obtained by the observers of the Skipjack Program with those obtained in the Yellowfin Program).

The Group should, therefore, take into account the questions which the YYP Program hopes to answer, in particular: What effect has the decline in fishing effort had on the yellowfin population in recent years?

A YYP General Workshop will be held in May or June, 1988 at which time the preliminary results can be presented and the necessary analyses can be carried out during the session to obtain the final results and conclusions of the Yellowfin Year Program.

## 5. Recommendations

It was recommended that all Teams which still have funds available continue their activities.

Table 1. Summary of Yellowfin Year Program tagging in the east Atlantic in 1986 and 1987 (up to June 1)

| | | OPPORTUNISTIC TAGGING GHANA-BASED BB | | | | | R/V "NIZERY" | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cruise reference | | 1401 | 1402 | 1403 | 1404 | 1405 | 5017 | 5018 | 5019 | 5020 | 5021 |
| Date (month-year) | | V-86 | VII-86 | VIII-86 | XII-86 | I-87 | VI-86 | VIII-86 | XI-86 | I-87 | III-87 |
| No. of fish tagged | | 347 | 13 | 1388 | 241 | 300 | 219 | 1118 | 520 | 385 | 22 |
| Recoveries: | | | | | | | | | | | |
| Time at large (months) | 0 | | | 2 | 13 | | | 77 | | | |
| | 1 | | | | | | 1 | 14 | 3 | 3 | |
| | 2 | | | | | | 3 | 10 | 1 | 2 | |
| | 3 | | | 1 | | | 1 | | 1 | | |
| | 4 | | | | | | | 5 | | | |
| | 5 | | | | | | | 1 | | | |
| | 6 | | | | | | | 1 | | | |
| | 7 | | | | | | | | | | |
| | 8 | | | | | | | | | | |
| | 9 | | | | | | | | | | |
| | 10 | | | | | | | | | | |
| | 11 | | | | | | | | | | |
| | 12 | | | | | | | | | | |

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## Report of the Yellowfin Year Program Activities

A small group comprised of the Activity Team Leaders for the Yellowfin Year Program and other interested scientists met on October 16 under the chairmanship of Dr. A. Fonteneau, to analyze the development of the Program and new information on the activities carried out by the different countries.

### 1. Analysis of fishery statistics

It was considered that this matter was not really relevant to the activities of the Program, but rather the responsibility of the Sub-Committee on Statistics. It was noted, nevertheless, that the current statistics are in general satisfactory for the east Atlantic and are improving for the west Atlantic. Detailed information concerning Cape Verde, St. Helena and Uruguay was presented.

An intensive size sampling program was carried out in Cape Verde on the catches from the hand line fishery. This fishery targets large yellowfin. In 1986, more than 9,000 yellowfin caught by boats from Cape Verde were measured. The intensive sampling program continued in 1987. Size sampling was also carried out on baitboat catches. Some gonad samples were taken and confirmed the existence of summer spawning by yellowfin. The intensive sampling program showed that a wide range of sizes of yellowfin are caught by boats from Cape Verde, from 40 to 178 cm with a mode of 120 cm for the first quarter and many modes of different sizes during the rest of the year.

Size data for 1986 have been processed and 1987 data will be processed shortly. Data from gonads will soon be sent to ICCAT. The Group was informed that size data of medium size yellowfin caught by experimental fishing over the two shallow sea mounts within the St. Helena EEZ will be collected and sent to ICCAT as soon as possible.

The historical series of data on the longline fishery in Uruguay, effort and sizes for 1981-1986 have already been sent to the Secretariat.

### 2. Tagging program

A tagging cruise was carried out in Venezuela in August, 1987, by the R/V "Nizery" with mediocre results. Only 117 skipjack could be tagged and

no yellowfin. During the opportunistic tagging cruises conducted in 1987, 61 yellowfin were tagged. In October, 1986, 225 yellowfin were tagged by Venezuela during an opportunistic tagging cruise.

In the east Atlantic, five opportunistic tagging cruises were conducted on board Ghanaian baitboats and 2,071 yellowfin and bigeye were tagged. However, the recovery rate is very low; only 18 fish have been recaptured (13 yellowfin and 5 bigeye).

During the five east Atlantic cruises by the R/V "Nizery", 1,156 yellowfin and 951 fish of other tuna species were tagged. To date, 142 fish have been recovered, of which 77 were yellowfin, 47 were bigeye, 17 were skipjack and 1 was a black skipjack.

In the Canary Islands, a tagging cruise was carried out in 1986 and 90 yellowfin were tagged.

No yellowfin were tagged during the two tagging cruises carried out in the Azores in the summer of 1987.

To date, 90 yellowfin have been recovered during this Program, and their data have been processed. For tagging analyses, the Group should have all the tagging data available since the start of the fishery, which would include about 1,000 recoveries.

From St. Helena, four tagging cruises to the Bonaparte sea mount (15.40 S, 06.55 W) were made and 98 fish tagged within the fork length range 59-86 cm, mostly in October and December, 1986. Two fish have already been recovered by fishing on the sea mount. All data have been submitted to ICCAT.

3. Observer program

Spain carried out four cruises with observers on board Spanish purse seiners, two in 1986 and two in 1987.

Data from the two observer cruises aboard FIS purse seiners, one in 1986 and another in 1987, and from five cruises aboard Ghanaian baitboats have already been entered in the computer.

In Uruguay, an observer cruise on a longliner is under way and the data will be sent to ICCAT.

The Group recommended that all data from the observer program be processed and available at the ICCAT Secretariat before the end of December, 1987.

4. Growth

As recommended, yellowfin vertebrae have been sampled in Abidjan for a possible analysis of micro-elements and for growth studies. It was recommended that a specialized laboratory be found that could be contracted to analyze these pieces.

At present, otoliths are available from ten yellowfin tagged with tetracycline during the Skipjack Program. Their analysis suggests the existence of daily growth. The Group recommended that 50 otoliths from large yellowfin be collected to study real ages by the daily growth method.

Taking into account new multi-modal analysis methods which presently exist, the Group recommended that stock structure of yellowfin using modal progression be analyzed with these new performance methods.

## 5. Data processing

It is important that all 1987 catch, effort and size statistics be available for analysis, particularly, the statistics for the fisheries taking adult fish (longline, purse seine, Cape Verde). Analyses should be done on the east Atlantic as well as the west Atlantic.

Comparison of data should also begin for the period of intensive effort from 1980 and continue for the period of reduced effort, up to 1987, in order to monitor the recovery of the stock. All these data should be available before the technical meeting planned for July, 1988.

The format proposed in the Operational Plan of the Yellowfin Year Program should be used to code the observations. Coding the size files which have not been foreseen at the time of this meeting should be done according to the format specifications attached as Addendum 1.

The data collected by the ICCAT port sampling program for longline catches (Cuba, Taiwan, Korea, Japan), for 1986 and 1987 should be available at the Secretariat by April, 1988.

The present statistics are of good quality (catch, effort and size) for all fleets catching yellowfin. This information will be very important for analyzing stock recovery.

The work schedule and data analysis procedures were discussed and re-evaluated.

Two Working Group meetings appear necessary:

- a technical meeting to be held in July, 1988, in Dakar. This group will be responsible for a pre-analysis of fine basic data (logbooks, samples, observations, etc.). This Working Group will have the responsibility of preparing working files to be used in analysis of stock recovery. The choice of meeting place is due to the necessity of analyzing large files, which are too large for the disk capacity of the ICCAT computer.
- a meeting to be held in Madrid at the end of the first quarter of 1989 of all scientists interested in the Yellowfin Year Program. This group will be responsible for examining and discussing the national studies presented by the scientists and for carrying out the analyses considered necessary in the ICCAT computer. For this work, all population dynamics programs which could be useful for the analyses should be sent previously to ICCAT and tested.

6. Budget

There are about $90,000 left in the Program budget, as a result of the reduction of a number of the activities initially planned for the Program.

The expenses foreseen for carrying out the Program to the end are estimated to be about $25,000 (cost of analyzing samples, meetings and publication of results).

Estimated budget for the final phase (1988-1989) of the Yellowfin Year Program (YYP)

| | |
|---|---|
| Expenses of Dakar technical meeting | $ 3,000 |
| Expenses of Madrid meeting | 2,000 |
| YYP lottery | 1,000 |
| Otolith-vertebrae analysis | 8,000 |
| Travel | 2,000 |
| Publication of results | 5,000 |
| Contingencies | 4,000 |
| Total | $25,000 |

## FORMAT SPECIFICATIONS FOR FORM H

DATE SAMPLED (1–6) ☐☐☐☐☐☐ (Day, Mo., Yr.)

TYPE OF SAMPLING (RANDOM OR SELECTED) (7.) ☐ (1) (2)

VESSEL DATA (8–14) ☐☐ (Coun.) ☐ (Type) ☐ (Cat.) ☐☐☐ (No.)

LOCATION (15) ☐ (Sq.) (16–19) ☐☐☐☐ (Lat.) (20–23) ☐☐☐☐ (Long.)

SET NO. (24–25) ☐☐

CATCH (26–29) ☐☐☐☐ (In MT)

SPECIES (30) ☐

TYPE OF MEASUREMENT (31) ☐ LD1 (1) OR FL (2)

30 INDIVIDUALS ☐☐☐ (32–151)

# Report of the Meeting on the Program of Enhanced Research for Billfish

## 1. INTRODUCTION

A Program of Enhanced Research for Billfish was approved by ICCAT in 1986. A Research Plan was proposed and activities were limited in 1986-87 because of the time required to obtain private funding. To date, $25,500 have been raised to add to the $10,000 Commission funds. There is a strong possibility of $25,000 to $30,000 additional money being available in the near future. Furthermore, if the Program is successful, more private funding will likely be available for future years.

## 2. REVIEW OF WORK TO DATE

Document SCRS/87/18 reviewed the progress of the Program of Enhanced Research for Billfish. Draft plans for research prepared by the Secretariat were circulated in February, and July, 1987, and a final plan (SCRS/87/14) was circulated in September, 1987. With a $5,000 private donation, a trip to Venezuela was made by Drs. P. M. Miyake (ICCAT Secretariat) and E. D. Prince (U.S.A.). As a result of this trip, it was found that the large longliners (150-250 MT capacity, in particular six vessels using shallow longlines), which had previously fished in part, in the Caribbean moved to the Pacific in 1987. However, it was possible to initiate sea sampling in Venezuela on a fleet of 18 small longliners. In addition, billfish were given increased emphasis in Venezuelan port sampling. This was done through the cooperation of Dr. Acuna (Director de Pesca y Aquicultura), Sres. Sánchez, Alio, and Astudillo (FONAIAP).

One at-sea observer trip was made and two longliners were sampled in port. Biological samples were obtained for age and growth sampling from these efforts.

Tagging work began in Senegal and about 150 sailfish have been tagged to date. This work began using U.S. tags. ICCAT tags and equipment have been purchased by this Program and are now available. In addition, Senegal obtained over 500 sailfish length measurements.

The Program was intended to use ICCAT port samplers in St. Maarten and in the Canary Islands to sample billfish. However, the dressed condition of the billfish off loaded at these ports prevented proper species identification and standard length measurements. Therefore, research plans were developed to resolve problems with species identification and conversion of dressed carcass measurement to live weight or length (SCRS/87/18).

As an additional contribution to this program, the U.S. conducted eight longline observer trips in the Caribbean and Gulf of Mexico on U.S. vessels. There were 23 billfishes tagged on these trips (The U.S. tagged a total 4,091 billfish in 1986, SCRS/87/40).

Opportunities for research were reviewed. Document SCRS/87/84 described a developing sport fishery in the Azores. The Azores provides a good opportunity for tagging and for collecting catch records. It may also be possible to collect billfish by-catch data from the local longline fleet. A sport fishing logbook is being considered by the Azores.

Senegal has both artisanal and sport fisheries for billfish (SCRS/87/-72). Effort is increasing in the sport fishery. Much of the sailfish enters the market as smoked product. There is a good opportunity for tagging in the sport fishery and size measurements may be obtained from both fisheries.

Côte d'Ivoire also has good opportunities for sampling the artisanal and sport catch.

It was noted that catch sampling on the beach has been done in Ghana and past records may be available. Efforts might be increased through the ICCAT Billfish Program.

It was noted that billfish are caught by longliners fishing for swordfish in tropical areas as by-catch and are discarded or used as bait. Information on this catch may be able to be obtained by asking fishermen.

France has begun sampling billfish in the artisanal fisheries of Martinique and these data may be available at no cost to the ICCAT Billfish Program.

Korea noted that their catches of billfishes, which are distributed in surface layers, are very small as a part of the by-catch because their fleet has used mainly deep longline for bigeye in recent years.

The Group noted that there is a great possibility of obtaining better billfish data if species identification could be improved in longline logbooks.

## 3. PRESENT PROGRAM AND BUDGET

The Group decided that the present plan was adequate and contained the flexibility necessary. At present, additional funds would be used to extend the length of the Program as well as expand selected areas should the opportunities arise (e.g., large longliners returning to the Caribbean). It was noted that funds for the tagging lottery should be increased to allow for continuing the lottery in future years. Additional funds may be required for the development of chemical identification kits.

## 4. PRIORITY ACTION ITEMS

i) Survey countries to obtain detailed descriptions of methods of dressing billfish.

ii) Develop an interim sampling manual so that ICCAT samplers can immediately begin identifying and measuring billfish in the major transshipping ports. This manual should also include suggested logbook information that can be obtained from sport fisheries.

iii) Develop a tagging manual which should include an explanation of the value of tagging for sport fishermen.

iv) Communicate with all countries stressing the value of identification of billfish to species when submitting catch statistics to ICCAT.

v) Develop a final sampling manual after further research on problems of identification.

After discussion, the Group decided that to conduct the Program effectively it would be valuable to have east and west Atlantic coordinators and a general coordinator.

The Group decided to stress to the SCRS the importance of the ICCAT port samplers to the Billfish Program. These samplers are needed to obtain billfish samples from the distant water longline fleets. Without them, this very important part of the Billfish Program cannot be accomplished. These samples are critical to obtaining meaningful biostatistics for billfish in the catches of the distant-water fleets.

# Report of the Sub-Committee on Statistics

## 1. OPENING OF THE MEETING

The meeting of the Sub-Committee on Statistics was held in Madrid, Spain, at the Hotel Velázquez on October 20 and 22, 1987. Dr. R. Conser (U.S.A.), Convener of the Sub-Committee, chaired the entire session. In opening the meeting, the Convener stressed the importance of statistics which form the basis of all scientific studies. He noted that without good statistics, there would be no stock assessment and stock management could not be achieved.

## 2. ADOPTION OF AGENDA AND ARRANGEMENTS FOR THE MEETING

The Tentative Agenda was adopted and is attached as Addendum 1 to this Report. Dr. P. M. Miyake (Secretariat) served as rapporteur.

## 3. REVIEW OF THE STATISTICAL PROGRESS MADE BY NATIONAL OFFICES

### 3.1 National data collection systems

The Secretariat Report on Statistics and Coordination of Research (SCRS/87/13) was reviewed as to the progress made by the national offices in the collection of data. Table 1 shows the availability of 1986 data at the time of this meeting. From the Table, it is not clear whether the data are unavailable due to their not having been collected or to a delay in processing and/or reporting to the Commission. However, it seems that in most cases, the data are not available because they have not been reported to the Commission on time.

The Sub-Committee recognized, on the other hand, that there are still some data lacking due to a failure to collect these data.

### 3.2 Data processing by national offices

The Secretariat reported that most of the countries could process the data properly before submitting them to ICCAT. There are a few countries which provide raw data that are processed by the Secretariat. It was recognized that raw data are preferred to data which are improperly processed.

Ghanaian catch and effort and size data have been partly collected by the CRO-Abidjan through a contract with ICCAT. The size data for 1984 through 1986 were not verified but the Sub-Committee was informed that the verification had been done by the CRO and that they were just submitted to the Secretariat. The Sub-Committee expressed its appreciation to the CRO-Abidjan for their efforts in improving Ghanaian data.

The coverage of logbook data for the Ghanaian fleet is not as high as we had hoped, since the only log books made available are those collected at Abidjan. It is recommended that all the logbook copies collected as well as the results of sampling carried out at Tema be sent either to the CRO-Abidjan or to the Secretariat so that they can be combined together with the results of Abidjan sampling.

### 3.3 Reporting to ICCAT

The Sub-Committee was informed that submission of the previous year's Task I data by national offices was earlier and somewhat improved in 1987 than in 1986, which was the worst recent year. This was fortunate since the SCRS meeting was scheduled earlier this year.

Task I data (total catches by species, major areas and gears) were received for almost all the major fisheries by the end of August, except for Ghana, Venezuela and Cuba, and Japanese longline. Spanish data were received from a few different sources and some discrepancies in the data could not be clarified by that time.

The reporting of Task II catch and effort data as well as biological data has not been very timely. The Sub-Committee urged the scientists in charge to observe the deadlines for the submission of data, particularly if the SCRS meeting is to be held early again in 1988.

The Secretariat reported that sometimes the delay in data submission could be avoided solely by using the proper method of data submission. For the last two years, Venezuelan data, sent by surface mail, have taken over seven months to reach the Secretariat.

### 3.4 Improvements to be made

#### a) Venezuelan statistics

The Sub-Committee reviewed Document SCRS/87/11 which summarizes the processing of Venezuelan data as done by the Secretariat.

The Working Group on Juvenile Tropical Multi-species Statistics also recommended that a sampling scheme (multi-species) similar to that adopted at west African ports be applied to the surface fisheries in Venezuela and that a field sampling manual be developed by the tropical tuna group scientists to assist Venezuelan scientists in carrying out sampling. The Sub-Committee was informed that this manual has already been drafted and will become available shortly. The Sub-Committee expressed its satisfaction with these developments.

b) East Mediterranean tuna catch data

The Secretariat reported that due to the shortage of Commission funds, no substantial improvements could be made in this area. However, the results of various contacts established at the last meeting of the General Fisheries Council for the Mediterranean (GFCM) (Monaco, October 1986) through participation of the Assistant Executive Secretary has been producing quite positive results.

The Secretariat reported that Turkey began measuring bluefin tuna in 1987 and hopefully the results will become available within a short period. It was reconfirmed that the recent big increase (up to 2,000 MT) in bluefin catches reported to FAO by Greece was due to the mixture of all tuna species, mostly with albacore. A joint venture for bluefin fishing started between Greece and Japan. This development should be carefully monitored.

c) Delay in Japanese longline catch data

In the past, Japanese longline data have always been reported with a two-year time lag. It is well understood that the boats make trips lasting over 14 months, and therefore, data processing cannot even be started until well into the next year of the fishery. The Japanese scientists stated that preliminary Japanese longline data will be made available by April of the following year of the fishery, starting in 1988. The preliminary data could be processed based on logbooks collected throughout the year but not those catches reported in the following year. It is expected that at least 90% of the catches could be covered. The Sub-Committee appreciated this major effort by the Japanese scientists.

## 4. Examination of progress made by the Secretariat

### 4.1 Data processing carried out in 1987

The Micro-Vax II computer with VMS operating system is now in its second year of use at the Secretariat and the Sub-Committee was informed that the system is adequate and is functioning reasonably well.

The Assistant Executive Secretary reported that the transition of the data base from the old to the new system is being carried out, though with some delay, and that the structure of the data base has been improved tremendously.

The Sub-Committee noted that the Secretariat is gradually reducing its backlog of data management tasks accumulated over the last few years due to the efficient use of the in-house computer. In mid-July, when the installation of catch and effort data to the new system was completed, the Secretariat made copies of the entire catch and effort data base available to those scientists who had requested part of these data.

There are still some requests pending for size data, since the work of transferring the files is not yet finished. As soon as this is complete, copies of the size data will be made available.

The Sub-Committee reviewed the routine and special data processing done by the Secretariat during the year. The amount of routine work is increasing every year. In addition, this year, the amount of special work carried out by the Secretariat increased considerably.

## 4.2 Port sampling program

### a) Secretariat port sampling

The Sub-Committee was informed that routine port sampling from long-liners at various transshipment ports was continued by ICCAT. The current port sampling scheme is serving as the basis for the billfish port sampling. The Sub-Committee urged that the current system, in particular, those for the Canary Islands and Caribbean Sea, be continued in the future and be extended to include billfishes in the program.

However, it was recognized that there is some duplication of effort in measuring commercially important tuna species, between port sampling and national sampling. A biostatistical comparison of the two data sets should be done as soon as possible. Then, the costs and results should be well assessed, particularly in view of ICCAT's serious financial situation, for any necessary modifications. Further discussion on these points is noted under Item 6.7.

### b) Sampling from Ghanaian fleet

The Secretariat reported that the contract signed between the CRO-Abidjan and ICCAT in early 1986 to finance biological sampling from the Ghanaian surface fleet unloading at the port of Abidjan had been extended to 1987 since the major part of the Ghanaian fleet still unloads at Abidjan. As discussed in a previous section of this Report, and since the data from this sampling serves as the base on which the Working Group on Juvenile Multi-species Statistics can solve the species confusion of the Gulf of Guinea tropical tuna catches, the Sub-Committee recommended that the Commission renew this contract for 1988.

## 4.3 Secretariat data management policy

The Assistant Executive Secretary informed the Sub-Committee that the catch and effort data files are now reorganized by fisheries, while size data are being organized by species and fisheries. The Sub-Committee noted that these changes will facilitate data management at the Secretariat as well as for users of the files.

The Sub-Committee also reviewed and approved the major changes made in the file format, that the catch and effort records are no longer in a fixed field for each species but only actual catches are entered with species codes. It also approved other major improvements, including the addition of a code to identify the nature of files (basic file, raised working file, confidential file, etc.) and a code to indicate whether the file has been verified or not.

The policy established at the 1986 SCRS meeting for using the computer at the scientific meeting was reconfirmed as follows:

a) Scientists interested in using the Commission's computer during the SCRS sessions are invited to send the programs they wish to use to the Secretariat in advance of the meeting.

b) Scientists should let the Secretariat know in advance the amount of disk storage they need for their data files.

c) Scientists wishing to run a program on the ICCAT computer during the SCRS sessions are welcome to do so. However, these runs will have to be done by the scientists themselves.

d) In order to facilitate use of the ICCAT computer, the Secretariat should prepare a users' manual.

The Sub-Committee noted that this policy has been practiced during the 1987 SCRS Meeting and the Swordfish Workshop. The Secretariat reported that due to other high priority work, the users' manual could not be prepared but that it will be written in 1988. Instead, the Secretariat staff assisted the scientists with the system during the 1987 scientific sessions.

4.4 Data dissemination and publication

Following a decision made by the SCRS at its 1986 meeting, a new format was adopted for presenting data in the Data Record (from Vol. 27). It also recognized that the Statistical Series is now integrated into the Data Record. The Sub-Committee reviewed the new format and found it satisfactory.

It was confirmed that the entire catch and effort data base was sent out this year to those scientists whose data request had been pending due to time limitations and to the amount of data requests accumulated in a variety of fields. However, the Sub-Committee was informed that in the future, if a special segment of data is requested, it will be selected and sent rather than the whole data base.

The time lag between the receipt of data at the Secretariat and their availability to users was questioned. The Sub-Committee was informed that the Secretariat gives first priority to entering data received into the base. However, very often the Secretariat has to spend considerable time verifying and clarifying the raw data received before they can be entered and then a lot of man-power is required to enter them into the base. The data received on magnetic tapes and diskettes are much less problematic.

It was emphasized that data which reach the Secretariat should become available to users as quickly as possible so that scientists can work on the most recent data in their stock analyses.

Scientists are requested to observe the specifications required by the Secretariat for magnetic tapes and diskettes when submitting their data as such. At the same time, scientists should inform the Secretariat of the tape and data file specifications which their laboratories could accept, when a data request is made to the Secretariat.

### 4.5 Biostatistical assignments

The Sub-Committee noted that since the departure of the biostatistician, Mr. J. P. Wise, from the Secretariat, no attempt has been made to fill the position, mostly because of the lack of funds. No new biostatistical reviews were attempted this year but routine biostatistical work such as monitoring the sampling level, checking adequacy of data, verification of data, etc., has been continued by the current staff.

The Sub-Committee agreed that biostatistical assignments and their costs should be studied with other items under a later Agenda item for assessment of priorities.

### 4.6 Other matters

No other matters were discussed.

## 5. REVIEW OF PROGRESS MADE ON RECOMMENDATIONS FOR STATISTICS AS CONTAINED IN THE 1986 SCRS REPORT

The Sub-Committee heard from the rapporteur of each species section of the SCRS Report their reviews of progress achieved on recommendations for statistics made at the 1986 SCRS meeting. Many of these were already reviewed under their respective Agenda items. Also, the species sections of the SCRS Report show the results of appraisals of recommendations made previously on statistics of each species.

In general, some improvements have been achieved on many of the recommendations made last year but more effort is required in the future to meet these satisfactorily. A few recommendations have been well met. There are also many recommendations for which no progress has been reported this year.

## 6. FUTURE PLANS TO IMPROVE STATISTICS, AND RECOMMENDATIONS TO THE SCRS

### 6.1 Review of tropical tuna statistics

The Sub-Committee reviewed the Report of the Working Group on Juvenile Multi-species Statistics (Dakar, 1987) and found that the Group had achieved all they could up to that time. It concurred with most of the recommendations the Group made on procedures for adjusting tropical catch statistics for the Gulf of Guinea. It is hoped that further improvements and the accumulation of a few more years of sampling data will provide more information to work back for the years prior to 1984, when intensive sampling for species composition was started.

### 6.2 Review of billfish statistics

The Sub-Committee studied the recommendations made by the SCRS for the improvement of billfish data. It recognized that there have been some im-

provements in billfish sampling and collection of catch data but that there is still room for improvement. The Sub-Committee reviewed the Program Plan of Enhanced Research for Billfish and found that it offers the best opportunity to improve the billfish data base. The Sub-Committee fully supported the Program Plan and urged the Commission to accept it and carry it out in the next few years.

### 6.3 Collaboration with other agencies

The Sub-Committee reviewed the relationship which ICCAT has maintained with other organizations on statistics as reported in SCRS/87/13. It found that cooperation with other agencies has been increasing and is developing satisfactorily. In particular, a few activities were specified:

a) Coordinating Working Party on Atlantic Fishery Statistics (CWP)

The Assistant Executive Secretary reported on the outcome of the Thirteenth Session of the CWP, held on February 11-18, 1987, at FAO Headquarters in Rome, at which he represented ICCAT (SCRS/87/12). It was recognized that the nature of ICCAT's data collection is somewhat different from that of other organizations. However, some collaboration has been maintained and ICCAT has contributed to improving tuna statistics of other agencies.

b) Ad-Hoc Consultation on Global Tuna Statistics (CWP-TUNA)

The Report of the Second Ad-Hoc Consultation Meeting, which was held at the NMFS Southwest Fisheries Center in La Jolla, California, U.S.A., on May 21 and 22, 1987, (SCRS/87/16) and was attended by the Convener of this Sub-Committee and the Assistant Executive Secretary, was presented and reviewed. All the world regional agencies concerned with tuna statistics attended the session, including IATTC, ICCAT, IPTP, SPC, FFA and FAO.

The Sub-Committee was pleased with the developments concerning collaboration among world tuna agencies, which had been initiated by ICCAT and solicited by FAO. It concurred with most of the recommendations made by the Group and agreed that ICCAT should take the initiative to organize a more formal and permanent body in order to secure collaboration in improving world tuna statistics.

There were two distinct proposals made by the Group which directly involved ICCAT, i.e., to start world tuna boat registration and to change the English name for Euthynnus alletteratus. Those items are discussed under Agenda Items 6.5 and 6.6, respectively.

c) Data comparison between FAO and ICCAT data bases

It was reported that ICCAT again ran the program of comparison of ICCAT and FAO data bases this year. Discrepancies have been reduced to about a tenth of what they were when the first comparison was made in 1985. Besides, by doing such a comparison, both agencies have checked the validity of many

records in the past, and consequently FAO as well as ICCAT statistics have been improved to a great extent. The Sub-Committee felt that this effort should be continued in the future.

6.4 ICCAT computer system and data management

The Sub-Committee noted that in 1987 no hardware or software had been added to the ICCAT computer system due to the shortage of funds. During this SCRS session it became very clear that the disk space of the current system is insufficient to facilitate analyses carried out by scientists for more than one species. Also, the shortage of terminals, the lack of good graphics, etc. were very obvious. The Sub-Committee identified the following items, probably essential for the Commission's work, to be added to the system in the very near future. In particular, the Sub-Committee expressed its surprise that the first two items had not already been purchased:

-- Power stabilizer
-- Console terminal
-- Graphics software
-- X-Y plotter
-- APL language
-- Disc with larger memory
-- Expansion of real memory
-- IBM PC-Compatible
-- Laser printer

The Sub-Committee decided to postpone the discussion of this item until discussion of Agenda item 6.7.

The Sub-Committee noted with satisfaction that some laboratories concerned with tuna studies have obtained VAX systems (e.g., NMFS Southeast Fisheries Center, IATTC) and some are planning to obtain models similar to the Secretariat's (IEO laboratories). This would make the exchange of programs and data files much easier and a common system could be established among the laboratories.

6.5 Tuna fishing boat register

The proposal made by the Ad-Hoc Consultation of Global Tuna Statistics for collecting data on world tuna fishing fleet registration was explained by the Assistant Executive Secretary (SCRS/87/10 and SCRS/87/16).

The gains expected by launching such a program at this time within the Commission was questioned. After some discussion, the Sub-Committee agreed not to start such an ambitious program at this time when the work load of scientists and the Secretariat has already been overcharged. On the other hand, the idea should be kept and some studies on the feasibility and merit of such program for the Commission should be continued through correspondence.

6.6 Change of the English vernacular name for E. alletteratus

The Sub-Committee reviewed SCRS/87/9 and SCRS/87/16 concerning the proposal made by the Ad-Hoc Consultation for changing the English name of

Euthynnus alletteratus. The Secretariat reported that there has not been any mix-up between small tunas and little tuna in compiling statistics. On the other hand, many countries reported E. alletteratus to the Secretariat as black skipjack, since the counter species in the Pacific (E. affinis) has been called black skipjack.

The Sub-Committee recommended that the official ICCAT English name for this species be "Atlantic black skipjack" from now on.

6.7 Funding for statistical programs

The Sub-Committee expressed its concern on the financial situation of the Commission. In 1987, due to the financial difficulties of the Commission, activities in statistics have been curtailed. Some of the expected programs to improve Mediterranean statistics could not be carried out, computer facilities have not been reinforced as was requested by the SCRS, no additional biostatistical work has been undertaken, etc. Also, the port sampling program has been in danger.

Considerable discussion ensued during the session. The problem is that the Commission cut the budget, which includes scientific requirements. These cuts have had and will continue to have some impact on scientific activities and, unfortunately, the Commission meeting is held after the scientific session has ended.

A suggestion was made to study the priorities of scientific activities, including those discussed in this Report regarding additional requirements for the computer and port sampling, etc. The Convener of the Sub-Committee nominated Dr. A. Fonteneau to form a small group to study primarily the priorities of computer equipment. The group may also compare, in general terms, the estimated costs for various programs requested and address the priorities as well as the necessity of these programs that have possible repercussions which any budget cuts of these items would have on statistical activities.

The Group met at a later time and reported its studies; the Report is attached as Addendum 2 to Appendix 7 to Annex 10.

The Sub-Committee adopted the Report and endorsed the recommendations made by the Group.

7. OTHER MATTERS

At its 1986 session, the Sub-Committee approved revising the ICCAT Field Manual to include all the new findings and recommendations of the SCRS. However, the Secretariat reported that very little progress has been made on this project as a result of other, more urgent obligations. The Sub-Committee reiterated its decision that the revision be done as soon as time permits and that a draft be circulated among the pertinent scientists before publication and before the next SCRS Meeting.

The Sub-Committee also recommended that the species tables prepared by the Secretariat for the SCRS report cover the past 30 years and no countries should be combined as "others".

## 8. ADOPTION OF REPORT

The Report was adopted.

## 9. ADJOURNMENT

The meeting was adjourned.

Table 1. Progress in the collection of 1986 statistics (as of October 12, 1987)

| SPECIES, GEAR & COUNTRY | TASK I DATE REC'D 1986 | TASK I DATE REC'D 1987 | BOATS | TASK II CATCH & EFFORT DATE REC'D 1986 | TASK II CATCH & EFFORT DATE REC'D 1987 | BIOLOGICAL (SIZE) DATE REC'D 1986 | BIOLOGICAL (SIZE) DATE REC'D 1987 | REMARKS |
|---|---|---|---|---|---|---|---|---|
| **YFT, BET, SKJ - Surface Fleet** | | | | | | | | |
| BAITBOAT | | | | | | | | |
| Angola | Aug 8 | May 21 | X | Aug 19 | | Aug 19 | | Preliminary Task I data. |
| Brazil | May 9 | Jul 8 | X | Jul 22 | Jul 8 | Jul 22 | Jul 8 | Preliminary Task I data. |
| Brazil-Japan | May 9 | May 18 | | Jul 22 | May 18 | Jul 22 | May 18 | |
| Cape Verde | Sep 12 | | | Sep 12 | | Mar 7 | | |
| Cuba | May 14 | | | | | | Jul 28 | SKJ (and BLF). |
| FIS | May 19 | Jul 3 | | May 19 | Oct 3 | May 19 | Oct 3 | Task I 1986 & 1985 revised. |
| | | | | | Jul 13 | | Jul 13 | C/E and size 1984-1985. |
| Ghana | Jul 30 | | | | May 11 | | | Abidjan landings 1984-1986. |
| Korea | Aug 25 | Aug 7 | | Aug 25 | Aug 7 | Aug 25 | Aug 7 | |
| Portugal (Madeira) | | Apr 15 | X | | Apr 15 | Jun 20 | Sep 8 | |
| (Azores) | Jun 20 | Oct 12 | | Jun 20 | | Jun 20 | | |
| South Africa | Sep 26 | Aug 13 | X | Sep 26 | Aug 13 | | | |
| Spain (Canary Islands) | Oct 20 | May 26 | | Apr 14 | May 11 | Apr 14 | May 11 | Preliminary Task I data. |
| (Peninsula) | Oct 20 | Jul 6 | | | Jul 17 | | | Catch & effort for 1983-1986. |
| Venezuela | | | | | Jan 30 | Mar-Oct | Feb | Catch & effort for 1985. |
| VEN-FOR | | | | | Jan 30 | | | Catch & effort for 1985. |
| PURSE SEINE | | | | | | | | |
| Cuba | May 14 | | | | | | | |
| FIS | May 19 | Jul 3 | | May 19 | Oct 5 | May 19 | Oct 5 | Task I 1986 & 1985 revised. |
| | | | | | Jul 13 | | Jul 13 | Catch and effort 1984-1985. |
| Ghana | Jul 30 | | | | | | | |
| Japan | Mar 19 | May 11 | | Mar 19 | May 11 | | | |
| Morocco | | Jul 15 | | | | | | |
| Portugal (Mainland) | | Jul 6 | | | Jul 6 | | | |
| (Azores) | Jun 20 | Oct 12 | | Jun 20 | | Jun 20 | | |
| South Africa | Sep 26 | Aug 13 | X | | Aug 13 | | | |

| SPECIES, GEAR & COUNTRY | TASK I DATE REC'D 1986 | 1987 | BOATS | TASK II CATCH & EFFORT DATE REC'D 1986 | 1987 | BIOLOGICAL (SIZE) DATE REC'D 1986 | 1987 | REMARKS |
|---|---|---|---|---|---|---|---|---|
| Spain | Oct 20 | Jul 22 | | | Jul 17 | | | Catch and effort 1983-1985. |
| U.S.A. | Aug 19 | Aug 19 | | Aug 18 | Aug 19 | Aug 18 | Aug 19 | |
| U.S.S.R. | Sep 22 | Jun 1 | X | Sep 16 | Aug 26 | Sep 16 | | |
| Venezuela | | | | | Jan 30 | Mar-Oct | Feb | Catch and effort for 1985. |
| VEN-FOR | | | | | Jan 30 | | | |
| NEI | | | | | | | | |
| UNCL & OTHERS | | | | | | | | |
| Angola | May 6 | May 21 | | | | | | Preliminary Task I data. |
| Argentina | Mar 12 | Mar 12 | X | | | | | Preliminary Task I data. |
| Benin | | Feb 10 | | | | | | |
| Brazil | May 9 | Mar 9 | X | | | | | Preliminary Task I data. |
| Cape Verde | | | | | | | | |
| Ghana | | | | | | | | |
| Morocco | Sep 25 | Jul 15 | | | | | | |
| Portugal (Mainland) | | Jul 6 | | | Jul 6 | | | |
| (Madeira) | | | | | | | Feb 17 | |
| St. Helena | | Jun 25 | | | Jun 25 | | | |
| Sao Tomé & Principe | | | | | | | | |
| South Africa | Sep 26 | Aug 13 | X | | Aug 13 | | | |
| Spain (Peninsula) | Oct 20 | | | | | | | |
| U.S.A. | Aug 19 | Aug 19 | | Aug 18 | Aug 19 | Aug 18 | Aug 19 | |
| U.S.S.R. | Sep 22 | Jun 1 | X | Sep 16 | Aug 26 | | | |
| Venezuela | | | | | | | | |
| VEN-FOR | | | | | | | | |
| Albacore - Surface Fleet | | | | | | | | |
| BAITBOAT | | | | | | | | |
| Angola | Aug 8 | May 21 | | | | | | Preliminary Task I data. |
| Brazil | May 9 | Jul 8 | X | Jul 22 | Jul 8 | | | Preliminary Task I data. |
| Brazil-Japan | | | | Jul 22 | May 18 | Jul 22 | May 18 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Cape Verde | | | | | | | | |
| France | Jun 5 | Jul 29 | | | | | | Preliminary Task I data. |
| Portugal (Azores) | Jun 20 | Oct 12 | | Jun 20 | | Jun 20 | | |
| (Madeira) | | Apr 15 | X | May 9 | Apr 15 | Aug 14 | Sep 8 | |
| South Africa | Sep 26 | Aug 13 | X | Sep 26 | Aug 13 | | | |
| Spain (Canary Islands) | Oct 20 | Jul 6 | | Apr 14 | May 11 | Apr 14 | May 11 | |
| (Bay of Biscay) | Oct 20 | Jul 6 | | Oct 20 | | Oct 20 | | Preliminary Task I data. |
| (Mediterranean) | Oct 20 | Jul 6 | | Oct 20 | | Oct 20 | | |
| Venezuela | | | | | Jan 30 | | | Catch and effort for 1985. |
| VEN-FOR | | | | | Jan 30 | | | Catch and effort for 1985. |
| PURSE SEINE | | | | | | | | |
| FIS | May 19 | Jul 3 | | May 19 | | May 19 | | |
| France | Jun 5 | Jul 22 | | | | | | |
| Portugal (Mainland) | | Jul 6 | | | Jul 6 | | | |
| South Africa | Sep 26 | Aug 13 | X | Sep 26 | Aug 13 | | | |
| Spain | Oct 20 | Jul 6 | | | | | | Preliminary Task I data. |
| TROLL | | | | | | | | |
| France | Jun 5 | Jul 29 | | | | | | Preliminary Task I data. |
| Spain (Bay of Biscay) | Oct 20 | Jul 6 | | Oct 20 | | Oct 20 | | Preliminary Task I data. |
| U.S.A. | | | | | | | | |
| UNCL & OTHERS | | | | | | | | |
| Brazil | | Mar 9 | X | | | | | Preliminary Task I data. |
| Italy | | Oct 29 | | | | | | Task I data for 1984-1985. |
| Portugal (Azores) | | | | | | | | |
| (Mainland) | | Jul 6 | | | Jul 6 | | | |
| South Africa | Sep 26 | Aug 13 | X | Sep 26 | Aug 13 | | | |
| U.S.A. | Jun 5 | Aug 19 | | Aug 18 | Aug 19 | Aug 18 | Aug 19 | |
| Venezuela | | | | | | | | |
| VEN-FOR | | | | | | | | |

| SPECIES, GEAR & COUNTRY | TASK I DATE REC'D 1986 | 1987 | BOATS | TASK II CATCH & EFFORT DATE REC'D 1986 | 1987 | BIOLOGICAL (SIZE) DATE REC'D 1986 | 1987 | REMARKS |
|---|---|---|---|---|---|---|---|---|
| **Bluefin - Surface Fleet** | | | | | | | | |
| BAITBOAT | | | | | | | | |
| Cape Verde | | | | | | | | |
| France (Bay of Biscay) | Jun 5 | Jul 29 | | | | | | Preliminary Task I for 1986. |
| Portugal (Azores) | Jun 20 | Oct 12 | | Jun 20 | | Jun 20 | | |
| (Madeira) | May 9 | | X | Feb 12 | | Nov 5 | Jan 22 | Data for January-March. |
| | Sep 19 | | X | | | | May 25 | Data for April-June. |
| | Nov 17 | | X | | | | | Data for July-September. |
| | | Apr 15 | X | | | | | Data for October-December. |
| Spain (Canary Islands) | Oct 20 | Jul 6 | | Apr 14 | May 11 | Apr 14 | May 11 | Preliminary Task I for 1986. |
| (Bay of Biscay) | Oct 20 | Jul 6 | | | | Feb 4 | Mar 11 | Preliminary Task I for 1986. |
| | | | | | | Apr 14 | | |
| (Mediterranean) | Oct 20 | | | | | | | |
| PURSE SEINE | | | | | | | | |
| France (Mediterranean) | Jun 5 | Jul 29 | | | | Sep 30 | | Preliminary Task I for 1986. |
| Italy | | | | | | Oct 29 | | |
| Morocco | Sep 25 | Jun 15 | | | | | | |
| Norway | Feb 28 | Jul 14 | | | | | Feb 3 | Prelim. 1986 & 1985 revised. |
| Portugal (Mainland) | | Jul 6 | | | Jul 6 | | | |
| (Azores) | Jan 16 | Oct 12 | | | | | | |
| Spain | Oct 20 | Jul 6 | | | Oct 6 | | | Preliminary Task I for 1986. |
| U.S.A. | Aug 19 | Aug 19 | | Aug 18 | Aug 19 | Sep 29 | Aug 19 | |
| Yugoslavia | Mar 4 | | | | | | | |
| TRAP | | | | | | | | |
| Canada | May 23 | Jun 26 | | | | Sep 29 | Jun 26 | |
| Morocco | Sep 25 | Jun 15 | | | | | | |
| Spain | Oct 20 | Jul 6 | | | | | | Preliminary Task I for 1986. |

UNCL & OTHERS

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Canada | May 23 | Jun 26 | | | | Sep 29 | Jun 26 | |
| France (Mediterranean) | Jun 5 | Jul 29 | | | | | | Preliminary Task I for 1986. |
| Italy | Oct 29 | | | | | | | Task I data for 1984-1985. |
| Portugal (Azores) | | | | | | | | |
| (Madeira) | Feb 12 | | | Sep 19 | Apr 15 | Jun 20 | Jan 22 | BFT Size 1983-1985. |
| (Mainland) | | Jul 6 | | | Jul 6 | | Feb 17 | |
| Spain | Oct 20 | Oct 6 | | | Oct 6 | | | |
| U.S.A. | Aug 19 | | | Aug 18 | Aug 3 | Sep 29 | Aug 3 | |

**Billfish (including SWO ) - Surface Fleet**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Argentina | Mar 12 | Mar 12 | X | | | | | Preliminary Task I for 1986. |
| Benin | | Feb 10 | | | | | | |
| Brazil | May 9 | Jul 8 | X | Jul 22 | | Jul 22 | | |
| Canada | | | | | | | | |
| FIS | | | | | | | | |
| Ghana | Jan 30 | | | | | | | |
| Italy | Oct 29 | | | | | | | Task I data for 1984-1985. |
| Morocco | Sep 25 | Jun 15 | | | | | | |
| Portugal (Mainland) | | Jul 6 | | | Jul 6 | | | |
| (Madeira) | | Apr 15 | X | | Apr 15 | Aug 14 | | |
| (Azores) | Jun 20 | | | Jun 20 | | Jun 20 | | |
| Senegal | Oct 27 | Jun 29 | | Oct 27 | Jun 29 | | | |
| South Africa | Sep 26 | Aug 13 | X | Sep 26 | Aug 13 | | | |
| Spain | Oct 20 | Jul 6 | | Apr 14 | Oct 6 | | | Preliminary Task I for 1986. |
| U.S.A. | Aug 19 | Aug 31 | | Aug 18 | Aug 19 | Aug 18 | Aug 19 | SWO 1978-1986 data revised. |
| U.S.S.R. | Aug 18 | Jun 1 | X | Sep 16 | Aug 26 | | | |

**Small Tunas - Surface Fleet**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Angola | Aug 8 | May 21 | | Aug 19 | | Aug 19 | | Preliminary Task I for 1986. |
| Argentina | Mar 12 | Mar 12 | X | | | | | Preliminary Task I for 1986. |
| Benin | | Feb 10 | | | | | | |
| Brazil | May 9 | Jul 8 | X | Jul 22 | Jul 8 | | | Preliminary Task I for 1986. |
| Cape Verde | Sep 12 | | | Sep 12 | | | | |
| Cuba | May 14 | | | | | | | |
| FIS | | | | | | | | |

| SPECIES, GEAR & COUNTRY | TASK I DATE REC'D 1986 | TASK I DATE REC'D 1987 | BOATS | TASK II CATCH & EFFORT DATE REC'D 1986 | TASK II CATCH & EFFORT DATE REC'D 1987 | BIOLOGICAL (SIZE) DATE REC'D 1986 | BIOLOGICAL (SIZE) DATE REC'D 1987 | REMARKS |
|---|---|---|---|---|---|---|---|---|
| Ghana | Jul 30 | | | | | | | |
| Italy | | | | | | | | |
| Morocco | Sep 25 | Jun 15 | | | | | | |
| Portugal (Mainland) | | | | | | | | |
| (Azores) | Jan 16 | | | | | | | |
| (Madeira) | May 9 | | X | | | | | Data for January-March. |
| | Sep 19 | | X | | | | | Data for April-June. |
| | Nov 17 | | X | | | | | Data for July-September. |
| | | Apr 15 | X | | Apr 15 | Aug 14 | | Data for October-December. |
| Spain | Oct 20 | Jul 6 | | Apr 14 | | | | Preliminary Task I for 1986. |
| U.S.A. | Aug 19 | Aug 19 | | Aug 18 | Aug 19 | Aug 18 | Aug 19 | |
| U.S.S.R. | Sep 22 | Jun 1 | | Sep 16 | Aug 26 | Sep 16 | | |
| Yugoslavia | Mar 4 | | | | | | | |
| **All Species - Longline Fleet** | | | | | | | | |
| Brazil | May 9 | | | Jul 22 | | Jul 22 | | |
| Brazil-Japan | May 9 | | | Jul 22 | | Jul 22 | | |
| Canada | | Oct 7 | | | Oct 7 | | Oct 7 | |
| Canada-Japan | | Jun 26 | | | | | Jul 9 | |
| China (Taiwan) | Oct 28 | Aug 27 | X | Oct 28 | Aug 27 | Oct 28 | | |
| | | | | | Jan 20 | | Jan 20 | Data for 1985. |
| Cuba | May 14 | | | May 14 | | Jun 18 | Jul 28 | |
| Japan | Oct 20 | | | Feb 20 | Jun 10 | Aug 19 | Jun 25 | Size 1985. Supp. data 1984. |
| | | | | | | Aug 19 | Aug 6 | BFT catch by size 1985-1986. |
| | | | | | | | Sep 20 | SWO catch by size 1975-1985. |
| Japan-Canada-Observer | | | | | | | Oct 13 | Reported by Canada. |
| Japan-U.S.-Observer | | | | | Jun 26 | | Jun 26 | Reported by the U.S. |
| Korea | Aug 25 | Aug 7 | X | Aug 25 | Aug 7 | Aug 25 | Aug 7 | |
| Korea + Panama | | | | | | | | |
| Morocco | | | | | | | | |
| Panama | (Secretariat) | | | (See Korea+Panama) | | (See Korea+Panama) | | |
| Portugal | | Oct 12 | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| South Africa | Sep 26 | Aug 13 | X | | Aug 13 | | | |
| Spain | Oct 20 | Jul 6 | | | Oct 6 | | Oct 6 | Preliminary Task I data. |
| Uruguay | | | | Jan | Oct 6 | Jan | Oct 6 | |
| U.S.A. | Aug 19 | Aug 19 | | Aug 18 | Aug 19 | Aug 18 | Aug 19 | |
| U.S.S.R. | Sep 22 | Aug 26 | X | | Aug 26 | Sep 16 | | |
| Venezuela | | | | | Jan 30 | | Jul 30 | Catch and effort for 1985. |
| VEN-FOR | | | | | Jan 30 | | Jul 30 | Catch and effort for 1985. |

## AGENDA FOR SUB-COMMITTEE ON STATISTICS

1. Opening of the meeting
2. Adoption of Agenda and arrangements for the meeting
3. Review of the statistical progress made by national offices
   - 3.1 National data collection systems
   - 3.2 Data processing by national offices
   - 3.3 Reporting to ICCAT
   - 3.4 Improvements to be made
4. Examination of progress made by the Secretariat
   - 4.1 Data processing carried out in 1987
   - 4.2 Port sampling program
   - 4.3 Secretariat data management policy
   - 4.4 Data dissemination and publication
   - 4.5 Biostatistical assignments
   - 4.6 Other matters
5. Review of progress made on recommendations for statistics as contained in the 1986 SCRS Report
6. Future plans to improve statistics, and recommendations to the SCRS
   - 6.1 Review of tropical tuna statistics
   - 6.2 Review of billfish statistics
   - 6.3 Collaboration with other agencies
   - 6.4 ICCAT computer system and data management
   - 6.5 Tuna fishing boat register
   - 6.6 Change of the English vernacular name for E. alletteratus
   - 6.7 Funding for statistical programs
7. Other matters
8. Adoption of Report
9. Adjournment

## REPORT OF THE SPECIAL WORKING GROUP OF THE SUB-COMMITTEE ON STATISTICS ON EVALUATION OF PRIORITIES IN THE ICCAT STATISTICAL BUDGET

The Working Group reviewed budget information supplied by the Secretariat on expenditures required for statistical operation. Particular attention was directed to the computer budget. Additional equipment required for essential scientific work was considered.

The port sampling budget consists of a contract with the CRO-Abidjan for sampling of Ghanaian fleet landings there, and payment on a per-sample basis in Las Palmas, Tenerife, St. Maarten, Montevideo and Cape Town. The samplers in Las Palmas, Tenerife and St. Maarten primarily sample yellowfin, bigeye, and albacore in tropical waters but they can expand their work to swordfish and billfish. Taiwanese, Cuban, Panamanian and Korean flag vessels are sampled. In Montevideo, which has limited sampling, and Cape Town, which has intensive sampling, samples are mainly from Taiwanese longliners fishing in the higher latitudes. Taiwanese scientists are presently comparing the results of port sampling from Taiwanese vessels with samples taken at sea.

The port sampler in St. Maarten has resigned. It will be necessary for the Secretariat to travel to St. Maarten to employ and train a new sampler.

The computer budget was reviewed. The office supplies are budgeted at $1,500. The maintenance contracts for hardware ($13,000) and software ($8,700) are, of course, essential for computer operations.

The Working Group became aware that the Secretariat's computer did not have a power stabilizer. Operating without a stabilizer is extremely detrimental to the computer when power fluctuates or fails. It also causes great inconvenience for statistical operations which have to be repeated. It is recommended that a stabilizer which allows battery operation during power failure be considered as essential. Estimated cost without batteries is $1,000, or $2,500 with battery back-up.

Unavailability of personal computers and of terminals to interact efficiently with the computer on analytical programs greatly affects the work of SCRS. This can be solved in part by a purchase of a console ($1,000) for computer operations, freeing the sophisticated terminal now being used for use by scientists.

In addition to the console, it is important to purchase an IBM compatible PC with appropriate software for graphics, APL and communications. This should cost about $7,000. This compares with a cost of about $14,000

to have only APL and graphics capability on the main frame of the Vax computer as previously recommended.

The Group considered the availability of computer memory. The present memory for some analyses limits the use of the computer to one user at a time. This was very limiting during the bluefin analyses when U.S., Japanese, French and Spanish scientists all needed access to the computer. Additional real memory of 4 MB can be purchased for $2,000.

The ICCAT Vax computer is severely limited in disk capacity. This does not allow as many working groups as desire computer data access to the computer. Additional disk space can be purchased for $18,000 and requires purchase of a controller for $18,000. After purchase of the controller even more disk space can be purchased when it is needed. The Group recommends that this purchase be included in the 1989 ICCAT Budget.

Finally, the Group reviewed the request by the Secretariat for a laser printer (cost is $10,500). The Group noted that although this is listed as a computer cost, it is not needed for scientific work. Evaluation of the purchase of this item should be based on any savings in the Commission's printing costs.

In summary, the Group understands that computer-related purchases to be covered by the 1987-88 budget are those that are essential for the immediate scientific work of ICCAT. These costs are estimated to be $12,500. It is possible that the actual costs may be less. For the 1989 budget year, the Group strongly recommends purchase of additional disk space for $36,000.

# CHAPTER III
# National Reports

## NATIONAL REPORT OF CANADA

by

D. Clay

### 1. Status of the fisheries

#### 1.1 Bluefin tuna

Canadian nominal catch of Atlantic bluefin tuna in 1986 totaled 440 fish weighing 73.4 MT. Three hundred forty-three of these fish were caught by an offshore Japanese longline vessel under charter to a Canadian firm. These latter fish were considerably smaller than the fish landed by the Canadian inshore fishery. The trap fishery of St. Margarets Bay, Nova Scotia, took only two fish, both of which died in the pens. The numbers of fish caught were up this year, however, the landed weight was approximately half the 1985 value.

The mean weight of bluefin caught in the Gulf of St. Lawrence in 1986 was 446 kg. The provisional estimated mean weight for 1987 is 431 kg, the second consecutive year of declining mean weights after over a decade of increasing weights.

There has been no purse seine fishery for bluefin by Canadian vessels since 1981.

#### 1.2 Swordfish

The nominal landings of swordfish for Canada in 1986 totaled 985 MT, taken mainly on longline with minor catches by the harpoon fishery.

### 2. Research studies

#### 2.1 Bluefin tuna

Little biological sampling was conducted on the rod and reel and tended line fisheries although the offshore Japanese longline fisheries were extensively sampled while the vessels were within Canadian waters. Work is

Original report in English.

continuing on validation of aging by otoliths, some difficulties have been experienced with this work.

Individual weights were collected from all fish landed in 1986 and vessel log records from 1985 and 1986 were collected, coded for computer analysis and edited. The CPUE for 1986 in both mobile gear types has remained at an all-time low equal to the 1985 level.

### 2.2 Swordfish

No new studies were initiated and no tagging was carried out during 1986. A data report entitled "A summary of releases and recaptures of the Canadian large pelagic fish tagging program 1961-1986" is scheduled for publication in 1987.

## 3. Management

### 3.1 Bluefin tuna

Tuna fishery regulations are enacted under the federal Fisheries Act. The regulations for the Atlantic coast contain the following broad provisions:

1. A valid license is required.
2. By-catch of bluefin by other fisheries is permitted only under specific circumstances.
3. Season quotas and closings are imposed and can be varied annually.
4. Gear restrictions limit a vessel to two "tended lines" with up to a total of ten hooks or angling with on hook per line.
5. All bluefin landed must be tagged with a uniquely numbered identification tag.

There were over 700 small (<15 m) vessels licensed to fish bluefin tuna and they were limited (based on location of home port) in 1986 to the following periods and quotas.

| AREA | SEASON (dates) | QUOTA SEASON | QUOTA DAILY |
|---|---|---|---|
| 1. Prince Edward Island | 1/Jul - 14/Aug | hook & release | N/A |
| | 15/Aug - 31/Dec | 660 | 1 |
| 2. Newfoundland | 12/Jul - 19/Oct | 50 | unrestricted |
| 3. New Brunswick | 15/Aug - 31/Dec | 157 | 2 |
| 4. Quebec | 1/Aug - 31/Dec | 83 | 3 |
| 5. Nova Scotia | 15/Jul - 31/Dec | 140 | 2 |
| 6. Nova Scotia | 1/May - 31/Dec | 401 | unrestricted |
| 7. Nova Scotia | 15/Jul - 31/Dec | 26 | 2 |
| 8. Atlantic by-catch | N/A | 4 | unrestricted |
| TOTAL | | 1521 | |

### 3.2 Swordfish

Swordfish licenses were issued to approximately 533 vessels in 1986, 524 for harpoon and 54 for longline (some vessels have both). In Scotia Fundy region where the majority of the activity occurs, the fishery had 31 active longline licenses out of 47.

## 4. Preliminary information for 1987

### 4.1 Bluefin

The landings as of October 1, 1987, were approximately 120 fish, 40 percent above what they were at the same time in 1986. In 1987 the trap fishery has been more successful than in 1986 with present holdings estimated at about 60 fish.

Several experimental fisheries and charter operations are under way for 1987, however, it is still too early in the year to have any indication of success. Late season sightings have reported an unusual influx of small bluefin from southwestern Nova Scotia. Fourteen fish have been landed, they have a mean length of 175 cm (90 kg). Numerous sightings of small fish (jumpers) have been reported from St. Margarets Bay and along the Nova Scotia coast.

### 4.2 Swordfish

The quota for 1987 is 3,500 MT with 70 longline licenses issued. Of these licenses, 16 are new issues with 10 being in Scotia Fundy, 4 in Newfoundland and 2 in the Gulf regions.

# NATIONAL REPORT OF CAPE VERDE

by

H. Santa Rita Vieira

## 1. The fisheries

During 1986, 1,142 small boats (fishing with handline), 36 baitboats without freezers (fishing with pole and line) and one freezer baitboat.

## 2. The catches

Tuna catches during the past five years are summarized in Tables 1 and 2.

In comparison with 1985, the 1986 catches of yellowfin by baitboats increased considerably.

Skipjack catches decreased in 1986 due to problems with bait. In 1985, skipjack remained close to the shore and the ports, which allowed fishing with small ring nets usually used for catching small pelagics.

As regards the small boats, yellowfin catches in 1986 were slightly above the 1985 catch.

The baitboat catches for 1987 up to June are shown in Table 3. The data for the small boats are not yet available.

## 3. Fishing areas

Fishing activities in 1986 only took place around Cape Verde. In 1987, most fishing operations took place in Cape Verde but two baitboats left to fish off Senegal.

## 4. Statistics

For the baitboats, ICCAT's recommendations are followed for the collection of catch and effort data reported at the time of landing.

Original report in French.

We also try to collect catch statistics of tunas caught by the small boats through a sampling system. This is very difficult because of the wide range of landing points. We have not yet arrived at a definition of fishing effort by species.

## 5. Research activities

During 1986 and 1987 and within the framework of the Yellowfin Year Program, intensive size sampling was carried out on yellowfin caught by small boats. Sampling of gonads from yellowfin caught by handline was also done in 1986 and 1987. These activities were financed by ICCAT and by funds from the PNUD/FAO/CVI/82/003 Project.

## 6. Regulations

Decree number 97/87 of September 5, 1987, published in the Official Bulletin of the Republic of Cape Verde, No. 36, Chapter III, Protection of Resources, Article 18, put into effect the fishing regulations concerning yellowfin and bigeye. A photocopy of this decree was sent to the ICCAT Secretariat.

Table 1. Baitboat catches (MT), 1982-1986

| | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|
| T. albacares | 809 | 948 | 862 | 747 | 1322 |
| T. obesus | 137 | 291 | 97 | 32 | 30 |
| K. pelamis | 1584 | 1338 | 1030 | 1961 | 860 |
| Euthynnus+ Auxis | 218 | 4 | 6 | 24 | 12 |
| A. solandri | 29 | 26 | 25 | 23 | 12 |
| TOTAL | 2777 | 2607 | 2020 | 2787 | 2236 |

Table 2. Catches made by small boats (MT), 1982-1986

| | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|
| T. albacares | 2691 | 3392 | 1958 | 1154 | 2004 |
| T. obesus | 63 | 2 | 4 | 80 | 56 |
| K. pelamis | 52 | 62 | 342 | 69 | 17 |
| Euthynnus+ Auxis | 40 | 30 | 10 | 136 | 17 |
| A. solandri | 1453 | 1562 | 1340 | 119 | 193 |
| TOTAL | 4299 | 5048 | 3654 | 1558 | 2287 |

Table 3. Baitboat catches (MT), first quarter of 1987

| | |
|---|---|
| T. albacares | 88 |
| T. obesus | 1 |
| K. pelamis | 6 |
| Euthynnus+ Auxis | 0 |
| A. solandri | 13 |
| TOTAL | 108 |

# NATIONAL REPORT OF COTE D'IVOIRE

by

F. X. Bard, J. B. Amon Kothias

## 1. Activities of the tuna fleet

The decrease in yellowfin catches observed since 1984 was caused by the significant reduction in fishing effort by the Ivorian tuna fleet. The catastrophic financial results following this bad situation led to laying up all the Ivorian purse seiners. Consequently, the national production is zero. The catches made by canoes are negligible.

Nevertheless, Abidjan is still the most important tuna port in operation on the African coast. It handles landings and transshipments, around 80,000 MT of tuna per year, for the fleets of Spain, Ghana, France, Japan, Senegal and Norway.

Around 6,000 MT per year of small tunas caught incidentally are sold through a special market system.

## 2. Research activities

As regards research, the "Centre de Recherches Océanographiques" of Abidjan has a heavy workload, as follows:

--Collection of logbooks from about 400 trips.

--Multi-species measurements of around 60,000 fish, coding and acquisition and transmission to the countries concerned.

The activities of CRO relating to the Yellowfin Year Program are summarized as follows:

--Ivorian-French tagging from the research vessel "Nizery" which provided these results: 2,108 tunas tagged and 127 recoveries.
--Opportunistic tagging from baitboats in collaboration with Ghana. Neither the organization nor the results were satisfactory: 2,071 yellowfin were tagged and only 18 recovered.
--Collection of biological data (vertebrae, gonads) in the Abidjan canneries.
--Organizing placement of observers on board: two on French purse seiners and three on Ghanaian baitboats.

Original report in French.

# NATIONAL REPORT OF EQUATORIAL GUINEA

by

P. Bayeme Bayeme Ayingono

## 1. Fishing area

The overall surface of Equatorial Guinea's EEZ is around 312,000 $km^2$: the EEZ in the continental shelf (0-200 m) is around 11,710 $km^2$, and in the continental slope (200-700 m) is about 297,290 $km^2$. The length of the coasts is 410 km, and the length of the continental slope is 425 km.

## 2. Fisheries

A large variety of species of fish, especially of tuna (yellowfin, bigeye, skipjack, sharks, sailfish, swordfish, etc.) exist in Equatorial Guinea's fishing zone. These resources are exploited up to now by foreign fleets, through governmental agreements (EEC: France and Spain, and others that are illicit), but unfortunately we cannot report their catches as they have not be sent to us as of the date of this report. According to the source SCET-International, April, 1980, during 1970-1979 the following catches were made in Equatorial Guinea:

| Year | Catch (MT) | Year | Catch (MT) |
|---|---|---|---|
| 1970 | 4,430 | 1975 | 33,994 |
| 1971 | 6,136 | 1976 | 21,694 |
| 1972 | 9,945 | 1977 | 15,711 |
| 1973 | 8,415 | 1978 | 3,413 |
| 1974 | 17,740 | 1979 | --- |

For the period between 1984 and 1986, Equatorial Guinea did not have any catches, since for the moment it does not have its own fleet.

## 3. Research

Some countries and international organizations have carried out some research, but the results and reports of these studies have not been sent to Equatorial Guinea.

Original report in Spanish.

## 4. Legislation

The following laws were put into effect:

--Number 15/1984, limiting the Territorial Sea and the Exclusive Economic Zone to 200 miles

--Number 2/1987, of February 16, concerning fishing in Equatorial Guinea. This document regulates fishing activities at the national level; as it is so recent, the ICCAT recommendations on tunas and tuna-like species have been included.

# NATIONAL REPORT OF FRANCE

## 1. Status of the fishery

| | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|---|---|
| Yellowfin | 38.7 | 43.6 | 40.6 | 29.2 | 31.9 | 5.8 | 9.3 | 15.7 |
| Skipjack | 15.2 | 22.5 | 27.2 | 26.1 | 20.5 | 13.2 | 6.8 | 11.8 |
| Bigeye | 3.1 | 0.8 | 0.4 | 3.0 | 6.0 | 2.1 | 6.3 | 4.0 |
| Albacore | 8.0 | 4.2 | 3.3 | 3.6 | 3.0 | 2.9 | 2.2 | 1.2 |
| Bluefin | 1.8 | 1.7 | 2.4 | 5.0 | 4.1 | 4.2 | 5.6 | 3.8 |
| Total | 66.8 | 72.8 | 73.9 | 66.9 | 65.5 | 28.2 | 30.2 | 36.5 |

Catches of tunas by the French fleets in 1986 amounted to 36,500 MT. An increase in the catches made by the tropical fleets is noted as well as a decrease in the catches of temperate tunas.

### 1.1 Bluefin

The landings of bluefin were lower in 1986 than in 1985 with a total of more than 3,800 MT, of which 3,460 MT came from the Mediterranean purse seine fishery. It should be noted that a large part of the fleet remained in the port at the beginning of the year in order to sell the surplus from 1985.

### 1.2 Albacore

The 1986 season began with significant catches. The bad weather conditions in the month of August combined with the short supply of vessels targeting this species caused the catches to be lower than in 1985, with 1,200 MT in the Atlantic and 20 MT in the Mediterranean.

### 1.3 Tropical tunas

The catches of French baitboats operating in Senegal were stable in spite of the continued decrease in fishing effort, due to the excellent

Original report in French.

yields observed in 1986. Although fishing effort is still low, the tropical purse seine catches showed a marked increase due to the excellent yields of yellowfin and skipjack in 1986.

## 2. Research

The main organizations participating in tuna research programs are ORSTOM (Office de la Recherche Scientifique et Technique d'Outre-Mer) for tropical tunas (yellowfin, skipjack and bigeye), and IFREMER (Institut Français de Recherche pour l'Exploitation de la Mer) for temperate tunas (albacore and bluefin).

### 2.1 Albacore

The surveys were continued in 1986 on the commercial vessels. The close cooperation between the Meteorological Center, which provided satellite thermographic maps, and the IFREMER scientists on board vessels led to pinpointing an important concentration of albacore, exploited afterwards by the commercial vessels. Scientific assistance is provided from an assistance vessel during the entire albacore season.

In 1987, technical difficulties prohibited the distribution of satellite maps of surface temperatures. Nevertheless, IFREMER participated in the albacore cruises by repeating the experiments with drift nets where it was clearly demonstrated by the research vessel and some commercial vessels that yields could be doubled by using this technique at night and continuing to troll during the day.

In the Mediterranean, albacore and bluefin tagging cruises were carried out in 1986 and 1987. From a general point of view, the collection of statistical data was continued.

### 2.2 Bluefin

The sampling of bluefin tuna was continued in the Mediterranean on the landings of the 22 French purse seiners. A study has been undertaken since 1986 on the correlations between the concentrations of bluefin and the surface temperature patterns.

### 2.3 Tropical tunas

Research on the tropical tunas is done by the French scientists from ORSTOM within the framework of research agreements with Venezuela, Senegal and Côte d'Ivoire. The scientists mainly study yellowfin, skipjack and bigeye. In 1986, the scientists provided an analysis of the current recovery of the yellowfin stock in the east Atlantic. For this, France carried out various tagging cruises on their research vessel "Nizery" and many scientists worked on board the purse seiners in order to observe this fishery closely. Special efforts were also made on bigeye for the special day dedicated to this species by the SCRS.

# NATIONAL REPORT OF GHANA

by

M. A. Mensah

## 1. The fishing fleet

A total of 30 tuna vessels operated from Ghana in 1986; all were Ghana-flag vessels. They consisted of 25 baitboats and 5 purse seiners.

## 2. Landings

Landings in metric tons, made by all the Ghana-flag vessels were as follows:

| Species | Ghanaian industrial | Ghanaian artisanal |
|---|---|---|
| Yellowfin | 7,651.782 | Not available |
| Bigeye | 536.971 | Not available |
| Skipjack | 25,912.842 | Not available |
| Atlantic Black Skipjack | 617.308 | Not available |
| Total | 34,718.903 | |

The total quarterly baitboat landings were as follows:

| Species | 1st Quarter | 2nd Quarter | 3rd Quarter | 4th Quarter | TOTAL |
|---|---|---|---|---|---|
| Yellowfin | 951.645 | 553.053 | 958.467 | 1,577.209 | 4,040.374 |
| Bigeye | 77.340 | 42.200 | 40.900 | 101.330 | 261.770 |
| Skipjack | 6,144.116 | 4,823.601 | 5,290.210 | 7,978.826 | 24,236.753 |
| Atl. Black Skipjack | 122.485 | 113.133 | 69.732 | 218.468 | 523.818 |
| Total | 7,295.586 | 5,531.987 | 6,359.309 | 9,875.833 | 29,062.715 |

Original report in English.

The total quarterly landings by purse seiners were as follows:

| Species | 1st Quarter | 2nd Quarter | 3rd Quarter | 4th Quarter | TOTAL |
|---|---|---|---|---|---|
| Yellowfin | 917.692 | 1,128.350 | 628.388 | 937.191 | 3,611.621 |
| Bigeye | 126.716 | 30.809 | 88.221 | 29.660 | 275.406 |
| Skipjack | 650.157 | 406.220 | 598.440 | 21.670 | 1,676.487 |
| Atl. Black Skipjack | 36.437 | 27.087 | 30.171 | -- | 93.695 |
| Total | 1,731.002 | 1,592.466 | 1,345.220 | 988.521 | 5,657.209 |

## 3. Research

During the year, the collection of catch statistics (Task I and Task II) continued, but this work (especially Task II) was considerably hampered by the dual landing centers (Tema and Abidjan) of the Ghana-flag vessels.

Studies continued on length frequency distribution, sex structure and maturity of the three principal species, namely, yellowfin, skipjack and bigeye. Most of the normal landings were made at Abidjan while most or all of the market fish were landed in Tema. Thus, most of the sampling in Tema was done on the undersized tunas. A total of 5,771 yellowfin, 1,233 bigeye and 6,476 skipjack 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.

The inshore purse seine fleet which operates close inshore for sardinellas and other small pelagic fishes do catch yellowfin, bigeye, skipjack and Atlantic black skipjack. However, in 1986, significant quantities of large-sized yellowfin tuna were caught by this fleet very close inshore, some were over 140 cm in fork-length. This is unusual.

## 4. Yellowfin Year Program

Ghana participated in the Yellowfin Year Program in 1986. Ghanaian scientists took part in three opportunistic tagging cruises during the year under review.

Seven (7) tagged tunas were recovered in the course of the year.

Port sampling was continued but was hampered because most landings were made in Abidjan.

## 5. Research program for 1987-88

Efforts will be made for:

a) improvement of Task II statistics and size sampling,
b) improvement in logbook coverage
c) initiation of multispecies sampling to enhance estimation of species composition of tuna catches.

# NATIONAL REPORT OF JAPAN

by

T. Yonemori

## 1. Fishing activities

In 1986 and 1987, Japanese tuna fishing in the Atlantic was carried out by two types of gears: longline and purse seine. The 1986 Japanese catch of Atlantic tunas and billfishes is estimated to be about 39,000 MT, 85 percent of which was taken by the longline fishery (Table 1). The 30 percent decrease in catch in 1986 from 1985 was ascribed mainly to the decreased catch of the longline fishery. The purse seine catch was about 5,800 MT in 1986. In 1987, as of the time of writing this report, no substantial change is observed in fishing patterns of either fishery compared to those last year.

### 1.1 The longline fishery

In 1986, 190 longliners fished in the Atlantic (Table 2). The longline catch in 1986 is estimated to be about 33,200 MT, a 32 percent decrease from the 1985 catch (Table 3). This seems to reflect the substantial decrease in the actual number of longliners in the latter half of the year, which was due to a shift of a substantial number of boats to bigeye fishing grounds in the eastern tropical Pacific. Of the longline catch, bigeye amounted to 22,900 MT (69 percent), yellowfin 3,250 MT (10 percent), and swordfish 2,400 MT (7 percent).

### 1.2 The purse seine fishery

Two Japanese purse seiners operated in the Gulf of Guinea in 1986. The catch in 1986 was 5,805 MT, which was exclusively composed of skipjack and yellowfin tuna (Table 4). In 1987, the size of the purse seine fleet has not changed.

## 2. ICCAT regulations

Japanese fishermen have been under national regulatory measures concurring with those recommended by the International Commission for the Conservation of Atlantic Tunas (ICCAT) for bluefin, yellowfin and bigeye tunas. As regards bluefin tuna regulations, the areal closure has been in

Original report in English.

effect in the Gulf of Mexico throughout the year and in the Mediterranean Sea from May 20 to June 30, in addition to the areal quota as recommended by ICCAT. These closures seem to have served to reduce the fishing pressure on the spawning stocks. To monitor the longline fleet, a government patrol boat was dispatched to the Atlantic Ocean, especially in the Mediterranean Sea, during the closure periods of 1986 and 1987. The tropical surface fleet has also been under national regulation in accordance with the ICCAT 3.2 kg size limits for yellowfin and bigeye tunas.

## 3. Research activities

The Far Seas Fisheries Research Laboratory (FSFRL) has been conducting the collection and compilation of Atlantic fishery data necessary to scientific research on Atlantic tuna and billfish stocks. All the statistical data have been routinely reported to the ICCAT Secretariat and results of scientific research are also presented at the regular meetings and workshops of the Standing Committee on Research and Statistics (SCRS).

### 3.1 Fishery data

Until now, preliminary 1986 catch data (Task I) and final 1985 catch and effort data (Task II) for the longline fishery were reported to the ICCAT Secretariat. The quick reporting system of logbooks at a port of call has been functioning since its inception in April, 1984. Final processing of longline data for 1986 is now in progress. Task I and II data from the purse seine fishery were finalized and reported for 1986. On-board size sampling by longline boats has been continued, and compiled length data for 1985 were reported to ICCAT.

### 3.2 Tuna biology and stock assessment

The biology and stock assessment study by the FSFRL on Atlantic tunas and billfishes has been focused mainly on bluefin, bigeye and swordfish. Among the six papers presented at the 1987 SCRS meeting, two papers are related to the Swordfish Workshop, two papers review the assessment technique and future management schedule of bluefin tuna. One paper updated the production model on Atlantic bigeye tuna. In addition, one paper analyzed the size composition of yellowfin caught by Japanese longliners in 1955-64.

## 4. Papers prepared for 1987 SCRS

The documents presented to the SCRS in 1987 are listed in Appendix 3 to Annex 10 and/or are published in the Collective Volume of Scientific Papers, Vols. XXVII and XXVIII.

Table 1. Japanese catch (MT) of tuna and tuna-like fishes by types of fisheries, Atlantic and Mediterranean, 1981-1986

| Type of fishery | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|
| TOTAL | 52,975 | 63,174 | 33,995 | 42,566 | 53,731 | 39,008* |
| Longline (Home-based) | 36,797 | 50,304 | 25,685 | 39,095 | 48,505 | 33,203* |
| Pole-and-line | 16,178 | 10,620 | 5,577 | 565 | --- | --- |
| Purse seine | --- | 2,250 | 2,733 | 2,906 | 5,226 | 5,805 |

*Preliminary.

Table 2. Annual number of Japanese tuna boats operated in the Atlantic, 1980-1986

| Type of fishery | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|
| Longline (Home-based) | 320 | 269 | 182 | 212 | 208 | 190 |
| Pole-and-line | 10 | 7 | 4 | 2 | -- | -- |
| Purse seine | -- | 1 | 1 | 1 | 2 | 2 |

Table 3. Catches (MT) of tuna and tuna-like fishes taken by Japanese longline fishery, 1980-1986. (1986 figures are preliminary.)

| Year | 1981 | 1982 | 1983 | 1984 | 1985 | 1986* |
|---|---|---|---|---|---|---|
| Total | 37,636 | 50,794 | 25,596 | 39,096 | 48,497 | 33,203 |
| Atlantic | 37,535 | 49,828 | 24,913 | 38,041 | 47,477 | 32,868 |
| Albacore | 2,298 | 1,350 | 1,318 | 800 | 1,467 | 1,568 |
| Bigeye | 21,044 | 32,867 | 15,141 | 24,310 | 31,602 | 22,900 |
| Bluefin | 4,286 | 2,865 | 3,320 | 2,210 | 1,517 | 1,275 |
| Southern Bluefin | 2,506 | 1,135 | 505 | 1,636 | 1,468 | 350 |
| Yellowfin | 4,145 | 6,062 | 2,069 | 3,967 | 5,308 | 3,250 |
| Swordfish | 2,232 | 3,723 | 1,893 | 3,770 | 4,309 | 2,400 |
| Blue marlin** | 468 | 1,132 | 440 | 833 | 1,090 | 500 |
| White marlin | 143 | 111 | 44 | 76 | 126 | 145 |
| Sailfish*** | 94 | 173 | 69 | 97 | 122 | 100 |
| Others | 319 | 410 | 114 | 342 | 468 | 380 |
| Mediterranean | 101 | 966 | 683 | 1,055 | 1,020 | 335 |
| Bluefin | 100 | 961 | 677 | 1,036 | 1,006 | 328 |
| Swordfish | 1 | 5 | 6 | 19 | 14 | 7 |

*Preliminary.
**Includes minor amount (less than 30 MT) of black marlin.
***Includes shortbill spearfish.

Table 4. Catches (MT) of tuna taken by the Japanese Atlantic purse seine fishery, 1980-1986

| Year | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|
| Total | --- | 2,250 | 2,733 | 2,906 | 5,226 | 5,805 |
| Bigeye | no fishery | 30 | 22 | 23 | 10 | 1 |
| Yellowfin | no fishery | 810 | 1,245 | 1,516 | 2,789 | 3,152 |
| Skipjack | no fishery | 1,410 | 1,440 | 1,367 | 2,427 | 2,652 |
| Albacore | no fishery | --- | 26 | --- | --- | --- |

# NATIONAL REPORT OF KOREA

by

National Fisheries Research and Development Agency

## 1. Fishing activities

The size of the Korean tuna fleet fishing in the Atlantic Ocean has decreased continuously since 1977 and was comprised of 28 longliners in 1986. No baitboat has been in operation since April, 1985 (Table 1).

The total Korean commercial catch of tuna and tuna-like fishes amounted to 9,964 MT in 1986, which shows a decrease of 42.9 percent compared to that of the previous year (Table 2). The catch composition by major species is as follows:

| | | |
|---|---|---|
| Bigeye | 6,084 MT | (61 percent of the total catch) |
| Yellowfin | 1,818 MT | (18 percent of the total catch) |
| Albacore | 694 MT | (7 percent of the total catch) |

There have been no significant changes in fishing patterns or grounds for the Korean tuna longliners in recent years. Bigeye tuna is one of the major species since the Korean deep longline was introduced in 1980 in the Atlantic Ocean (Table 3).

The total catch for the first half of 1987 is estimated to be 4,506 MT.

## 2. Research activities

The National Fisheries Research and Development Agency (NFRDA) collected catch and effort data as well as size data on tunas and related species from the commercial fishing vessels as in the past. In particular, deep longline data have been continuously collected from the fishermen since 1984. Task I, II, and size data were regularly sent to ICCAT.

An intensive effort was made to improve the coverage rate and accuracy of data for a better assessment of Atlantic tuna and tuna-like species resources. As a result, Task II data coverage was 71.9 percent for the longline fishery in 1986.

Original report in English.

Table 1. Number of Korean tuna vessels in the Atlantic Ocean, 1975-1986

| Type of gear | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Longline | 118 | 121 | 120 | 97 | 66 | 54 | 56 | 52 | 53 | 51 | 45 | 28 |
| Pole-and-line | 8 | 6 | 15 | 20 | 18 | 16 | 8 | 4 | 4 | 1 | 1 | -- |
| TOTAL | 126 | 127 | 135 | 117 | 84 | 70 | 64 | 56 | 57 | 52 | 46 | 28 |

Table 2. Korean catch (MT) of Atlantic tunas and tuna-like fishes by type of gear, 1975-1986

| Type of gear | 1975 | 1986 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Longline | 38819 | 31575 | 38849 | 29094 | 20060 | 18592 | 22306 | 21033 | 16224 | 14785 | 17454 | 9964 |
| Pole-and-line | 7653 | 3339 | 6202 | 19364 | 17188 | 9901 | 9529 | 3503 | 1697 | 969 | 250 | --- |
| TOTAL | 46472 | 34914 | 45051 | 39458 | 37248 | 28493 | 31835 | 24536 | 17921 | 16724 | 17704 | 9964 |

Table 3. Nominal catch (MT) by species of tunas and tuna-like fishes taken by the Korean Atlantic longline fishery, 1971-1986

| Year | BFT | YFT | ALB | BET | SKJ | SWO | BLM | WHM | SAI | Other bill-fishes | Others | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 7,375 | 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 | 20,094 |
| 1979 | 2 | 6,997 | 3,875 | 7,305 | 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 | 1,077 | 9,383 | 530 | 462 | 65 | 20 | 4 | 51 | 1,224 | 16,224 |
| 1984 | -- | 2,673 | 1,315 | 8,943 | 29 | 406 | 61 | 5 | 3 | 423 | 927 | 14,785 |
| 1985 | 77 | 3,239 | 901 | 10,691 | 20 | 344 | 54 | 1 | 105 | 729 | 1,293 | 17,454 |
| 1986 | -- | 1,818 | 694 | 6,084 | 11 | 82 | 15 | -- | 62 | 105 | 1,093 | 9,964 |

# NATIONAL REPORT OF PORTUGAL

by

J. Pereira

## 1. Fishery

Portuguese tuna fishing takes place mostly in the Azores and Madeira, where the local baitboat fleets seasonally catch tunas with live bait. Two new surface longline fisheries, mostly targeting swordfish, are developing in the Azores and continental Portugal. A sport fishery for blue marlin is developing in the Azores.

The catches of the tunas and tuna-like species in 1986 reached 13,996 MT, which reflects the very high catches made recently. The increase in catches is due to the development of the tuna fishery in the Azores where the baitboat catches rose from 7,600 MT in 1985 to 11,200 MT in 1986.

Table 1 summarizes the catches of the main tuna species for the last few years, by fishing area. Preliminary estimates of catches made during the first three quarters of 1987 indicate a catch of 700 MT in Madeira and 11,100 MT in the Azores.

## 2. Fleet

The Portuguese tuna fleet is comprised of baitboats in the Azores and Madeira and of some longliners based in Azores and continental Portugal. The number of baitboats, classified by gross tonnage (GRT), of the fleets from the Azores and Madeira are shown in Tables 2 and 3.

The Azorean baitboat fleet has developed during the last few years in the sense that the boats have more autonomy and capacity to refrigerate the fish, which allows them to extend the duration of the cruises and the fishing areas. Since 1984, 11 new baitboats have entered the Azorean fishery, of which 3 entered in 1986 and 6 in 1987.

The Azorean longline fleet is comprised of 10 boats as of September 30, 1987, of which there are 4 in the 150-200 GRT category; the rest are less than 50 GRT.

Concerning the sport fishery, the Azorean fleet is presently comprised of six speed boats.

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Original report in French.

## 3. Research

The main organisms participating in research programs on tunas are the University of Azores (Department of Oceanography and Fisheries) in the Azores and the Laboratory of Fishery Research in Madeira.

The collection of tuna statistics and sampling of the main species continued normally in 1986 and 1987. The data are sent regularly to ICCAT and the scientific results are also presented to the SCRS meetings and Working Group meetings.

Two new surface longline fisheries targeting swordfish have developed recently in continental Portugal and the Azores. The one in the Azores was preceded by experimental fishing in 1985 and 1986.

In 1987, in view of the development of new fisheries, fishing licenses for the longline fleet and for the sport fishery were made available to the fishing captains in the Azores. Research programs have begun on these fisheries.

The results of size sampling, in number of fish measured, in the Azores and Madeira from 1984 to 1986, are shown in Table 4.

## 4. References

Documents presented to the SCRS in 1987 are listed in Appendix 3 to Annex 10 and/or are published in the Collective Volume of Scientific Papers, Vols. XXVII and XXVIII.

Table 1. Catches of tunas and tuna-like species (MT) made in Azores and Madeira, 1984-1986

| | 1984 | | 1985 | | 1986 | |
|---|---|---|---|---|---|---|
| | Azores | Madeira | Azores | Madeira | Azores | Madeira |
| BET | 3455 | 831 | 5036 | 1403 | 5453 | 1698 |
| SKJ | 3579 | 174 | 2089 | 285 | 5032 | 329 |
| ALB | 566 | 196 | 505 | 127 | 436 | 13 |
| YFT | 450 | 32 | 6 | 14 | 34 | 10 |
| BFT | 17 | 1 | 3 | 1 | 151 | 1 |
| OTH | 41 | 23 | 42 | 39 | 170 | 41 |
| TOTAL | 8108 | 1257 | 7681 | 1869 | 11276 | 2092 |

Table 2. Distribution of the Azorean baitboat fleet by gross registered tonnage (GRT), for 1984-1987

| GRT | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|
| < 50 | 11 | 11 | 12 | 14 |
| 50-100 | 18 | 19 | 19 | 19 |
| 101-150 | 1 | 1 | 4 | 7 |
| > 150 | 0 | 0 | 0 | 3 |
| TOTAL | 30 | 31 | 35 | 43 |

Table 3. Distribution of the Madeiran baitboat fleet by gross registered tonnage (GRT), for 1984-1986

| GRT | 1984 | 1985 | 1986 |
|---|---|---|---|
| < 50 | 17 | 21 | 26 |
| 50-100 | 5 | 5 | 6 |
| TOTAL | 22 | 26 | 32 |

Table 4. Number of fish sampled in Azores and Madeira, 1984-1986

| | 1984 | | 1985 | | 1986 | |
|---|---|---|---|---|---|---|
| | Azores | Madeira | Azores | Madeira | Azores | Madeira |
| BET | 1855 | 984 | 1350 | 881 | 3946 | 554 |
| SKJ | 2262 | 103 | 1555 | 838 | 3508 | 1187 |
| ALB | 374 | 351 | 519 | 122 | 509 | 138 |
| YFT | 549 | 237 | 78 | 12 | 19 | |
| BFT | | | 27 | 1 | 103 | 2 |
| OTH | 7 | | 32 | | 190 | |
| TOTAL | 5047 | 1675 | 3561 | 1854 | 8275 | 1881 |

# NATIONAL REPORT OF SENEGAL

by

T. Diouf

## 1. Tuna fishery

### 1.1 Yellowfin, skipjack, bigeye

The tuna fleet based in Dakar in 1986 was comprised of 19 baitboats and 4 purse seiners, with Senegalese flags (baitboats and purse seiners) and with French flags (baitboats). The overall total catches made by these boats in 1986 (11,876.5 MT) is less than in 1985 (-3,071.1 MT, -20 percent) (Table 1). This decrease is explained by the decline in fishing effort observed for the baitboats (-28 percent) as well as for the purse seiners (-9 percent) and by the late start of the fishing season. This fleet landed all of its catches in Dakar. In 1986, however, a Senegalese purse seiner landed 609 MT (28 percent) of its catches in Abidjan.

The landings and transshipments of the fleet not based in Dakar (French and Spanish, mainly) caught 25,918 MT, an amount near the total for 1985 (25,437 MT) (Table 1). The decrease observed for the FISM purse seiners (between 1985 and 1986, -254 MT) was compensated for by an increase in Spanish purse seine activities during the same period (+834.8 MT).

These total landings and transshipments of tunas in Dakar reached 37,800 MT in 1986, 8 percent less than the 1985 total.

### 1.2 Other species

The total catches of small tunas in 1986, all fisheries combined, of 6,112 MT, are comparable to those of 1985 (5,861 MT) (Table 2). However, a decrease is noted in catches of Atlantic black skipjack (-824 MT) while the catches of Atlantic bonito and West African Spanish mackerel increased by 163 percent and 58 percent, respectively. These variations are explained by an improvement in statistical coverage and by increased interest in these species. The apparent decrease in catches of Atlantic black skipjack is explained by the fact that the volume of catches for 1986 included only the landings made in the main centers of the artisanal fisheries.

The overall catches of sailfish (Table 3) in 1986 (612.5 MT) increased by 118 percent, compared to 1985. This increase is due above all to the increasing effort of the artisanal fisheries on this species following the

Original report in French.

establishment of a local commercial market. The catches of the sport fishery in 1986 (43.1 MT) are slightly higher than those of 1985 (34.8 MT).

## 2. Research

The collection of tuna statistics and sampling in the port of Dakar in 1986 continued as usual. The sampling rate of the baitboats was around 70 percent while that of the purse seiners surpassed 80 percent. The number of fish measured as well as the number of samples made on the different FTSM and Spanish fleets are shown in Table 4 and 5.

During the tagging cruises on artisanal boats in 1986, 120 Atlantic black skipjack were tagged along the Senegalese coasts. The recoveries remained low but showed that tagging from artisanal canoes is viable and that small tunas seem to migrate along the coast at the sub-regional level.

A tagging cruise was carried out on board the R/V "Nizery" within the framework of the Yellowfin Year Program in collaboration with the "Centre de Recherches Océanographiques" of Abidjan. A total of 1,124 individuals of different tuna species were tagged. The recoveries from this cruise are accounted for as they are found and are included in the general file submitted to ICCAT for later processing.

The work carried out by the "Centre de Recherches Océanographiques" in Dakar in 1986 included:

--synthesizing the information on bigeye regarding the biology and the exploitation of this species
--studying the species composition of catches of small-sized tunas (yellowfin, skipjack, bigeye) by purse seiners and baitboats in the Cape of Three Points area
--showing the influence on tuna fishing of the abnormal climatic environment in Cape Lopez in 1984.

Finally, the participation of the CRODT in the development of a synthesis on tropical tunas led to outlining the information acquired on this species and to define the research perspectives. This synthesis is to be published in 1987 by FAO.

## 3. Publications

Documents presented to the SCRS in 1987 are listed in Appendix 3 to Annex 10 and/or are published in the Collective Volume of Scientific Papers, Vols. XXVII and XXVIII.

Table 1. Tuna fishing in Dakar, 1986, number of boats per fleet, effort in days at sea by type of fishing and by fleet, landings by species, by type of fishing and by fleet

| | No. of boats | Effort in days at sea | CATCHES YFT | SKJ | BET | TOTAL 1986 | TOTAL 1985 |
|---|---|---|---|---|---|---|---|
| Dakar-based | | | | | | | |
| --baitboat | 19 | 2297 | 4199.8 | 2206.6 | 2449.4 | 8855.9 | 10406.7 |
| --purse seiner | 4 | 475 | 1166.0 | 1852.1 | 2.1 | 3020.6 | 4540.9 |
| 1986 Total | 23 | -- | 5365.8 | 4058.7 | 2451.5 | 11876.5 | |
| 1985 Total | 25 | | 6413.2 | 6864.8 | 1669.6 | 14947.6 | |
| Not Dakar-based --FISM (Landings and transshipments) | 7 | 247 | 3048.7 | 2182.2 | 75.8 | 5306.7 | 5660.5 |
| Spain (Landings and transshipments) | 25 | 2429 | 6494.6 | 13375.5 | 741.0 | 20611.1 | 19776.3 |
| 1986 Total | 32 | 2676 | 9543.3 | 15557.7 | 816.8 | 25917.8 | |
| 1985 Total | 39 | 3694 | 15049.6 | 9188.9 | 1198.3 | 25436.8 | |

Table 2. Landings (MT) of small tunas in Senegal in 1986

| Species | Artisanal Fishery | Commercial Fishery | Total |
|---|---|---|---|
| Atlantic black skipjack (Euthynnus alletteratus) | 3620 | 773* | 4393 |
| 1985 Total | 2992 | 1196 | 4188 |
| West African Spanish mackerel (Scomberomorus tritor) | 1376 | 0 | 1376 |
| 1985 Total | 1145 | 0 | 1145 |
| Atlantic bonito (Sarda sarda) | 343 | 0 | 343 |
| 1985 Total | 524 | 0 | 524 |

*Includes Auxis spp.)

Table 3. Landings (MT) of Atlantic sailfish (Istiophorus albicans) in Senegal in 1986

| | Number of Individuals | Weight | Percent | Percent in 1985 |
|---|---|---|---|---|
| Artisanal fishery | 18970 | 569.4 | 92.9 | 87.1 |
| Sport fishery | 1539 | 43.1 | 7.1 | 12.4 |
| Total | 20509 | 612.5 | 100.0 | 100.0 |
| 1985 Total | 9710 | 280.4 | | |

Table 4. Number of fish measured by species and fleet in Dakar in 1986

| Fleet | Gear | YFT | SKJ | BET | OTH* | TOTAL |
|---|---|---|---|---|---|---|
| FISM | Baitboat | 2026 | 1505 | 974 | 10 | 4515 |
| | Purse seine | 553 | 1236 | 25 | 17 | 1831 |
| Spain | Purse seine | 1865 | 3473 | 215 | 702 | 6255 |
| Total | | 4444 | 6214 | 1214 | 729 | 12601 |

*Includes ALB, FRI, LTA

Table 5. Number of samples by species, gear and fleet and number of samples made in 1986 in Dakar

| Fleet | Gear | YFT | SKJ | BET | OTH | TOTAL |
|---|---|---|---|---|---|---|
| FISM | Baitboat | 35 | 19 | 17 | 2 | 73 |
| | Purse seine | 8 | 15 | 3 | 1 | 27 |
| Spain | Purse seine | 37 | 43 | 17 | 42 | 139 |
| TOTAL | | 80 | 77 | 37 | 45 | 239 |

# NATIONAL REPORT OF SOUTH AFRICA

by

A. J. Penney

## 1. Tuna landings

Tuna landings during 1985 and 1986 are compared in Table 1. The overall tuna catch decreased by 13 percent to 5,075 MT, reversing the increasing catch trend of the past few years. This decline was mainly due to an 11 percent decline in the albacore catch, to 4,763 MT. The decreased albacore catch resulted partially from a decline in availability of the species off the northwest coast and partially due to redirection of fishing effort to the profitable and expanding squid fishery off the southeast Cape coast. Despite a fourfold increase in the catch on longlines, poles still accounted for approximately 90 percent of the total tuna catch. The yellowfin catch again decreased to only 57 MT and purse seine effort was again negligible. The catch of bigeye tuna, caught during albacore poling operations on the west coast, increased slightly while the by-catch of broadbill swordfish on the hake and kingklip longlines decreased to only 5 MT.

## 2. Research

### 2.1 Length-frequency sampling

Monitoring and length-frequency sampling of local and Taiwanese tuna catches continued at a similar level to 1985. A total of 10,173 albacore were measured from 101 Taiwanese longliners transshipping 12,546 MT of albacore and 776 MT of other tuna species in Table Bay harbor. Sampling of South African catches decreased by roughly one third to 2,503 tuna from 21 boats, as a result of the difficulty of attending after-hours offloadings.

### 2.2 Catch and effort data collection

Distribution of the recently developed tuna catch logbooks was increased to improve coverage of South African tuna catches. Development of the necessary data capture and analysis programs started towards the end of the year.

### 2.3 Environmental research

A number of multi-disciplinary research cruises were conducted in tuna-fishing areas, during which various physical, chemical and biological surveys were conducted.

Original report in English.

Table 1. Reported South African tuna landings during 1985 and 1986

| Species | Catch (MT) 1985 | 1986 |
|---|---|---|
| Albacore | 5360 | 4763 |
| Yellowfin tuna | 328 | 57 |
| Bigeye tuna | 117 | 135 |
| Skipjack tuna | 52 | 115 |
| Swordfish | 8 | 5 |
| Total | 5865 | 5075 |

# NATIONAL REPORT OF SPAIN

## 1. Fishery

The Spanish catches of tunas and tuna-like species in the Atlantic Ocean and Mediterranean remained at the same level as the previous year, reaching 154,507 MT, just 1.1 percent less than in 1985. The catches in the Atlantic were 151,029 MT (97.8 percent); the rest, 3,478 MT (2.2 percent), came from the Mediterranean.

The distribution of the catches by species for the last two years is as follows:

| | 1985 | 1986* |
|---|---|---|
| Yellowfin | 67.9 | 62.1 |
| Skipjack | 35.6 | 40.6 |
| Albacore | 21.3 | 22.1 |
| Bigeye | 10.3 | 12.0 |
| Swordfish | 8.7 | 9.2 |
| Small tunas | 7.3 | 5.3 |
| Bluefin | 5.1 | 3.2 |
| Total | 156.2 | 154.5 |

*Provisional

The catches of tropical tunas remained practically the same as in 1985, just 900 MT higher in 1986. Catches of albacore and swordfish also remained stable. Catches of small tunas decreased 2,000 MT, as did those of bluefin whose decrease was due to the reduction of trap catches in southern Spain.

## 2. Research

The Spanish organism in charge of research on tunas and tuna-like species is the "Instituto Español de Oceanografía" (I.E.O.).

### 2.1 Temperate area

Research is centered on bluefin, albacore and swordfish.

Original report in Spanish.

2.1.1 Bluefin

The distinct nature of the live-bait fisheries of the Bay of Biscay, the traps in the Gulf of Cadiz/Strait of Gibraltar and the fisheries in the Mediterranean are studied.

In the Bay of Biscay, 20 boats targeted albacore and incidentally caught young bluefin.

A new trap ("Nueva Umbría") was installed in the Strait of Gibraltar, which increased the total to five traps operating in this area. Three other traps were in operation in 1986 in the Mediterranean Sea.

Bluefin are sampled regularly for various biological studies. Special attention was paid to age and growth and the proportion of sexes of spawning tunas caught in the traps in southern Spain.

In October, 1986, a tagging cruise was carried out in the Bay of Biscay in which 837 juvenile bluefin were tagged. Of these, 36 (4.2 percent) were recovered by the tuna vessels in the area before the end of the fishing season. Most of these recoveries were made by the tuna vessels targeting albacore.

Estimates of fishing mortality were made from the recoveries. These values are applied to the juvenile bluefin population analyses of the Atlantic portion of the east stock. A transatlantic east-west migration was discovered from one recovery. The recovered tuna was tagged in the Bay of Biscay as a juvenile and as an adult was caught by a Japanese longliner off the U.S. coast.

2.1.2 Albacore

The surface fishery for albacore in the Cantabrian-Galician region continued in the same conditions as in previous years. There was no variation in the number of boats in operation in this fishery. The season continued until mid-November, at the end of which very good catches were made of albacore spawners, with some individuals weighing up to 35 kg.

A tagging cruise tagged 213 juvenile albacore in the Cantabrian Sea during October, 1986.

2.1.3 Swordfish

In the 1986 fishing season, around 210 longliners operated in the Atlantic Ocean and 140 in the Mediterranean.

In preparation for the Swordfish Workshop held in October, 1987, many projects were carried out, such as:

--CPUE analysis of the different fishing zones frequented by the Spanish fleet. The strata chosen was $5^{o}x5^{o}$.

--Studies on the experimental fishing cruises in the North Atlantic and amplification of the fishing areas.

--Studies on the growth and maturity of swordfish in the Atlantic and Mediterranean.

--Studies on the species accompanying swordfish in the longline.

--Detailed studies on size/weight relations by time/area strata.

## 2.2 Canary Islands area

Updating continued of the local fleet file. In 1986, contrary to what occurred in previous years, only four vessels from the peninsula fished around the Canary Islands.

The local fleet is comprised of 428 boats, of which 71 percent are less than 10 GRT; 10 percent are over 100 GRT and the rest, between 10 and 100 GRT. The catches were stable at a level similar to pre-1985 levels, when the highest catches were made.

Collection of detailed Task II statistical data has a coverage rate of about 95 percent.

Around 18,500 of the five most important tuna species in the area were measured.

## 2.3 Tropical area

At the beginning of 1986, the Spanish purse seine fleet in the east Atlantic was comprised of 40 vessels, of which at the end of the year three were inactive, two had sunk and one had changed its type of fishing. In the west Atlantic there was no fishing activity by Spanish vessels.

Task II data for 1985 and 1986 were processed.

Three cruises were made on board tuna vessels for the Yellowfin Year Program. During these cruises, data were registered on the activity of the vessels, species composition of the catches was determined and 4,300 fish were measured in 86 samples. Other studies were also done, such as tracing tags in the freezers during landings.

# NATIONAL REPORT OF URUGUAY

by

O. Mora

## 1. Introduction

In 1986, the Uruguayan tuna fleet, comprised of six longliners, targeted species that can be prepared as "sashimi". In addition, in 1985 and the beginning of 1986, five boats fished for albacore. The six longliners targeted swordfish, bigeye and yellowfin, depending on the time of the year. Most of the year they fished in Uruguayan territorial waters ($34^{o}$–$37^{o}$S latitude, $50^{o}$–$54^{o}$W longitude). The other boats extended their area of operation to $12^{o}$S latitude.

## 2. Catches

The total catch for 1986 was around 1,120 MT, composed of swordfish (32 percent), bigeye (14 percent), yellowfin (21 percent), albacore (23 percent) and miscellaneous (marlins, sharks, etc.) (9 percent).

As in previous years (Table 1), swordfish was the most-caught species (362.5), except in 1985 when the catches of albacore were higher (1,531.3 MT) caused by the boats targeting this species.

The 1986 catches of the main species show a decreasing trend in comparison with the previous year.

## 3. CPUE

In 1986, a slight decrease was observed in swordfish CPUE as compared to the previous year (Table 2). After the decrease in 1983, the CPUE fluctuated around the 1983 level, with the high levels for each species being repeated in the same seasons as in previous years (in winter for swordfish and albacore, and in autumn and spring for bigeye and yellowfin).

## 4. Research

Research is centered, this year, on the analysis of the data from the logbooks of the national fleet.

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Original report in Spanish.

In addition, sampling of landings has continued, in which the predorsal length of bigeye, yellowfin and albacore is measured. It was impossible to obtain information on swordfish, due to the fact that it is fileted before landing.

Presently sampling is being done for the first time on board a tuna boat, in order to identify the species caught, obtain weights and lengths--in part for the calculation of conversions--and to extract gonads, spines and stomachs.

Until now, two papers have been written, in addition to the report presented to the Swordfish Workshop. One of them described the fishery, including the gears and type of activity, catches, effort, and yield of swordfish, bigeye, yellowfin and albacore. The other was a comparative analysis of yields between the common Argentine-Uruguayan fishing area and the international waters, which revealed significantly higher values in the former area.

Table 1. Catches (MT)

| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|
| SWO* | 62.4 | 388.4 | 732.7 | 1,302.1 | 760.0 | 362.5 |
| BET | 76.0 | 351.6 | 535.4 | 632.0 | 410.0 | 156.9 |
| YFT | 59.4 | 189.6 | 315.5 | 325.8 | 313.3 | 238.5 |
| ALB | 23.4 | 234.8 | 373.1 | 525.6 | 1,531.3 | 262.3 |

*Fileted weight.

Table 2. CPUE (Kg/1,000 hooks)

| | 1981 | 1982 | 1983 | 1984 | 1985* | 1986 |
|---|---|---|---|---|---|---|
| SWO | 378.5 | 475.0 | 296.7 | 271.6 | 323.4 | 264.4 |
| BET | 466.0 | 430.0 | 216.8 | 131.8 | 275.4 | 114.5 |
| YFT | 364.2 | 231.9 | 127.7 | 68.0 | 172.7 | 174.0 |
| ALB | 143.5 | 284.2 | 151.1 | 109.6 | 177.9 | 191.3 |

*Does not include boats fishing for albacore.

# NATIONAL REPORT OF THE UNITED STATES

by

National Marine Fisheries Service*

## 1. Introduction

The National Marine Fisheries Service (NMFS) has the responsibility for U.S. fishery statistics and for research on Atlantic tunas and tuna-like species in support of the ICCAT Convention. Research responsibilities are now solely those of the Southeast Fisheries Center, Miami, Florida. The activities related to these responsibilities in 1986-87 are described in this report.

## 2. Fisheries monitoring

The NMFS monitors U.S. tuna fisheries for yellowfin and skipjack tunas (the principal tropical species), for bluefin and albacore tunas (the principal temperate species), and for bigeye which occurs in both tropical and temperate waters. Fisheries for billfish (marlins and sailfish) and other scombrids are also monitored. Significant effort is also expended in monitoring the commercial swordfish fishery. These activities include the design of sampling programs; collection of catch, effort and biological data; and maintaining and summarizing fishery data bases for analyses as well as dissemination to ICCAT and other management organizations. In the past, estimates of the recreational catches of small bluefin tuna in the northeastern U.S. (Virginia to New York) have been made annually. For 1986, the recreational catches were estimated for all tunas (only small bluefin are estimated, catches of larger bluefin are known) and billfish taken in the northeast. These catches were dominated by yellowfin tuna (935 MT), followed by small bluefin (178 MT), bigeye (156 MT), and albacore (116 MT). Historical catches of Atlantic tunas by U.S. fishermen (1967-1986) are presented in Table 1.

### 2.1 Tropical tunas

U.S. vessels catch tropical tunas in the northwestern Atlantic off the east coast of the United States, in the Gulf of Mexico, and in the Caribbean Sea. The total U.S. catch of the three principal species of tropical tunas (yellowfin, bigeye and skipjack) in 1986 was 7,105 MT. This includes estimated recreational rod and reel landings of 1,343 MT not estimated in

*Prepared by staff members of the Southeast Fisheries Center, Miami, Florida.
Original report in English.

earlier years. The 1986 catch represents a substantial decrease from the 8,399 MT in 1985. The overall lower catch in 1986 probably was due to improved fishing opportunities for large purse seine vessels in Pacific waters, which resulted in a lower effort by these vessels in the Caribbean compared to 1985.

Three vessels making a total of five trips were responsible for all of the Caribbean catch by purse seiners: 614 MT of yellowfin and 572 MT of skipjack. An additional 66 MT of yellowfin and 63 MT of bigeye were taken in the Caribbean by swordfish longliners operating off Puerto Rico and the Virgin Islands. An expanding longline fishery for yellowfin tuna in the Gulf of Mexico was responsible for the bulk of the yellowfin catch in 1986, 2,907 MT. This is almost double the 1985 catch by this fishery, 1,479 MT. Of the 33 MT of blackfin tuna caught in 1986, yellowfin longliners in the Gulf of Mexico were responsible for more than half, 19 MT.

In 1986, approximately 10,393 MT of skipjack and 31,885 MT of mixed yellowfin and bigeye tuna were caught in the Atlantic by foreign vessels and imported into the United States by large cargo ships that unloaded at Puerto Rico. Of this tonnage, 52 percent of the skipjack and 59 percent of the mixed yellowfin-bigeye catch came from the eastern Atlantic in the Gulf of Guinea. A port sampling program at Puerto Rico indicated that the mixed catch of yellowfin and bigeye was approximately 82 percent yellowfin and 19 percent bigeye in terms of number. Measurements of samples initially sorted by size indicated that 96 percent, by number, of the yellowfin and 79 percent, by number, of the bigeye sampled were below the 3.2 kg size limit imposed by ICCAT. A total of 1,568 yellowfin and 503 bigeye were measured. Most of the samples were from weight categories 1.4-1.8 kg and 1.8-3.4 kg, which were the predominant size categories of transshipments from both baitboats and purse seiners fishing in the Gulf of Guinea.

## 2.2 Temperate tunas

The U.S. bluefin tuna fishery continues to be regulated by quotas and size limits. Bluefin tuna catches by U.S. vessels operating off the east coast of the United States and in the Gulf of Mexico during 1986 amounted to 1,142 MT. This represents a decrease of 281 MT from the 1985 landings. The catch by various gears was as follows: 360 MT by purse seine, 139 MT by longline (of which 111 MT were from the Gulf of Mexico), 326 MT by rod and reel, 190 MT by handline and 127 MT by harpoon. Different environmental conditions in the Gulf of Maine during 1986 may have contributed to the decrease of 157 MT from 1985 for large bluefin by the rod and reel fishermen.

Limited dockside sampling was initiated in parts of the southeastern U.S. in the spring of 1986 in response to increased fishing activity aimed primarily at yellowfin tuna. The resulting data and limited information from the northeastern U.S. was used to develop a partial estimate of the number of bluefin tuna which were discarded dead (1,755 fish weighing approximately 355 MT) during February through December. The estimate is considered highly uncertain, because the sampling fraction was often small, coverage was not complete in sampled areas throughout the year, and much of the information was provided verbally by fishermen.

Catches of Atlantic albacore tuna totaled 162 MT in 1986. As with the tropical tunas, this was the first year that estimated rod and reel landings (123 MT) were included.

### 2.3 Billfishes

United States vessels landed 4,884 MT of swordfish in 1986, an increase from 4,618 MT in 1985. This increase was primarily due to the expansion of the longline fishery into the Caribbean in 1986. Landings of swordfish, by longliners, by area, for 1986 (compared to 1985) were: 3,244 MT (3,593 MT) from the northwest Atlantic, 422 MT (575 MT) from the Gulf of Mexico, and 1,153 MT (395 MT) from the Caribbean. The decrease in landings from the northwest Atlantic and Gulf of Mexico was due to a shift in effort to the Caribbean area.

Blue marlin and white marlin were landed as a by-catch of the commercial longline fisheries and by recreational rod and reel fishermen. The 1986 recreational catch of blue marlin was estimated to be 147 MT of the total 191 MT. For white marlin the recreational estimate was 31 MT of the total 90 MT. The recreational rod and reel landings for sailfish were not estimated. By area, for all gears combined, the estimated total landings of blue marlin and white marlin, respectively, were: 83 MT and 36 MT from the northwest Atlantic; 56 MT and 51 MT from the Gulf of Mexico; and 52 MT and 3 MT from the Caribbean. There were 3 MT of sailfish landed by U.S. longliners.

## 3. Research activities

In addition to monitoring the various fisheries, scientists from the Southeast Fisheries Center also conducted research activities on bluefin tuna, swordfish and marline designed to increase biological knowledge of these species and to provide information for management to east coast Fishery Management Councils. This research includes updating and revising data bases, preparation of software and analyses in support of domestic goals as well as participation in ICCAT, and participation in special working groups.

### 3.1 Bluefin tuna

The VPA tuning procedure recently used at SCRS was investigated to determine its sensitivity to variations in catch at age, partial recruitment patterns and abundance indices. Abundance indices, based on U.S. observer data from the Japanese longline vessels fishing in the U.S. FCZ, were updated.

The preliminary identifications of bluefin larvae from the Gulf of Mexico larval surveys in 1984 and 1986, and associated statistics were reviewed and finalized (Table 2). The estimates of 1984 and 1986 spawning stock numbers and biomass increased by approximately 10 percent.

A bluefin larval survey was not conducted in the Gulf of Mexico in 1985. A bluefin survey was conducted in the Florida-Georgia Bight during late April and May 1985, and 14 bluefin tuna larvae were collected in 65 samples. This is outside the reported spawning area but within the reported spawning season. Based on their age and the speed of the Florida current, many of the larvae could have been spawned in the southeastern Gulf of Mexico. However, one small larva collected at latitude 33°44'N was probably spawned no farther south than Miami.

A review of environmental effects on the abundance of larval bluefin tuna revealed no clear pattern. In addition to the regular survey for larval bluefin tuna in the Gulf of Mexico, in 1987 several transects were made across Loop Current fronts to learn more about the distribution of bluefin larvae with respect to environmental features.

### 3.2 Billfish monitoring

During 1986, our efforts for monitoring catch rates of Atlantic billfish resulted in coverage of 89 tournaments and 9 docks. This resulted in 65,846 hours of fishing effort documented. A pilot study is currently being conducted (1987) in the Gulf of Mexico to determine the feasibility of improving our recreational landings data for billfish. Billfish research in 1986 emphasized development of marlin data bases and contracted studies to continue age and growth work. Staff accompanied the ICCAT Assistant Executive Secretary to Venezuela as part of a feasibility study for the development of the ICCAT Enhanced Research Program for Billfish. The Program includes port sampling and at-sea observers, with the objectives of obtaining more detailed statistics on catch and effort, instituting and promoting the ICCAT billfish tagging program, and assisting ongoing age and growth studies. Working documents on swordfish age and growth, indices of abundance for blue and white marlin, and a program plan and progress report of the ICCAT Enhanced Research Program for Billfish were prepared for the 1987 SCRS meeting.

### 3.3 Tagging

In 1986 there were 4,091 billfish and 400 tuna tagged through the NMFS Cooperative Gamefish Tagging Program. Recaptures included a white marlin that had been tagged off North Carolina in 1983 and recaptured near Curaçao and three trans-Atlantic migrations of bluefin. All three bluefin had been tagged in the Mid-Atlantic Bight, one was recaptured off southwest Spain by a Japanese longline vessel and the other two in the Mediterranean by Spanish traps.

### 3.4 Domestic Longline Observer Project

The Domestic Longline Observer Project began in late 1985 and is the responsibility of the Southeast Fisheries Center (SEFC). The objective is to place observers aboard voluntary commercial longline vessels targeting yellowfin tuna, or taking these fish as bycatch, in order to collect scientific data. SEFC personnel are responsible for training observers, devel

oping the database, and producing analytical data summaries, reports and analyses. In 1986, a contract was awarded to the University of Puerto Rico to begin the Caribbean Observer Project. Basic data collected include gear information, species composition by area and by set, and biological samples for age and growth analysis and for sex ratio information by size and area.

### 3.5 Special working groups

Significant effort was expended this year in preparation for participation in the ICCAT Swordfish Workshop in Madrid. Final U.S. landings estimates (1978-86), catch-at-size estimates, sex ratio data, mark-recapture data, and hardpart aging data were compiled. Research was conducted leading to preparation of working documents in the areas of stock structure, indices of abundance, age and growth, and a historical review of the U.S. swordfish fishery.

A SEFC scientist attended the planning meeting for analyses of data from the ICCAT-sponsored Yellowfin Year in Dakar, Senegal, and participated at the ICES meeting in Copenhagen.

### 3.6 Mackerels

An extensive research program was conducted during 1986 on king and Spanish mackerel. The research included collection of catch and effort data from fisheries throughout the Gulf of Mexico and southeastern coasts of the United States and collection of size frequency information throughout the region. Research on stock identification through electrophoresis and other methods was conducted. These data were used for extensive stock assessment analyses of mortality and abundance. The results of the analyses were the basis of management action in United States waters for both king and Spanish mackerel.

Table 1. Catches and landings (MT) of Atlantic tunas and tuna-like fishes by United States fishermen, 1967-1986[1]

| Year | BFT[6] | YFT[2,3] | ALB | BET[2] | LTA | SKJ[2] | BON | SWO[4] | SSM | KGM | Unclassified | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1967 | 2,320 | 1,136 | 0 | 0 | 7 | 493 | 22 | 474 | 3,577 | 2,767 | 10 | 10,806 |
| 1968 | 807 | 5,941 | 0 | 18 | 6 | 3,314 | 43 | 274 | 5,342 | 2,813 | 2 | 18,560 |
| 1969 | 1,226 | 18,791 | 0 | 148 | 7 | 4,849 | 98 | 171 | 4,952 | 2,814 | 1 | 33,057 |
| 1970 | 3,327 | 9,029 | 0 | 195 | 158 | 11,752 | 83 | 287 | 5,506 | 3,050 | --- | 33,387 |
| 1971 | 3,169 | 3,764 | 0 | 544 | 5 | 16,224 | 90 | 35 | 4,713 | 2,571 | 50 | 31,165 |
| 1972 | 2,138 | 12,342 | 10 | 212 | 212 | 12,290 | 24 | 246 | 4,863 | 2,213 | --- | 34,550 |
| 1973 | 1,294 | 3,590 | 0 | 113 | 20 | 21,246 | 261 | 406 | 4,437 | 2,710 | --- | 34,077 |
| 1974 | 3,638 | 5,621 | 13 | 865 | 51 | 19,973 | 92 | 1,125 | 4,990 | 4,747 | 1 | 41,116 |
| 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 | 1,848 | 9,747 | 9 | 248 | 113 | 8,492 | 224 | 3,684 | 3,310 | 2,507 | 31 | 30,213 |
| 1979 | 2,297 | 3,182 | 11 | 212 | 12 | 3,102 | 502 | 4,618 | 2,926 | 2,204 | 11 | 19,077 |
| 1980 | 1,505 | 2,118 | 21 | 202 | 88 | 3,589 | 195 | 5,624 | 5,429 | 3,192 | 513 | 22,476 |
| 1981 | 1,530 | 1,866 | 54 | 152 | 97 | 5,373 | 333 | 4,529 | 2,748 | 3,368 | 200 | 20,250 |
| 1982 | 812 | 883 | 126 | 377 | 87 | 731 | 209 | 5,086 | 3,747 | 3,713 | 962 | 16,733 |
| 1983 | 1,394 | 226 | 18 | 255 | 107 | 589 | 253 | 4,801 | 2,784 | 3,033 | 453 | 13,913 |
| 1984 | 1,320 | 1,252 | 25 | 408 | 41 | 817 | 217 | 4,538 | 1,892 | 2,403 | 883 | 13,796 |
| 1985 | 1,423 | 6,259 | 17 | 353 | 74 | 1,786 | 109 | 4,618 | 2,787 | 2,440 | 247 | 20,108 |
| 1986[5] | 1,142 | 5,354 | 162 | 747 | 103 | 1,004 | 83 | 4,884 | 5,753 | 5,588 | 337 | 25,157 |

1. Estimated catch is for bluefin tuna, yellowfin tuna, albacore, bigeye tuna, skipjack tuna and Atlantic black skipjack. 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. Swordfish landings have been revised for year 1978-1985. Totals have been revised accordingly.
5. Includes recreational rod and reel estimated landings.
6. Bluefin landings have been revised for years 1974, 1978, 1984, 1985. Totals have been revised accordingly.

Table 2. Summary of catches of bluefin larvae in the Gulf of Mexico with estimates of larval productions, spawning stock abundance and biomass for 1977, 1978, 1981-1984, 1986

| Year | 1977 | 1978 | 1981 | 1982 | 1983 | 1983[1] | 1984 | 1986[2] |
|---|---|---|---|---|---|---|---|---|
| Catch | 34 | 292 | 51 | 79 | 71 | 71 | 27 | 20 |
| Samples | 48 | 147 | 65 | 121 | 67 | 92 | 96 | 69 |
| Positive | 15 | 53 | 13 | 27 | 19 | 19 | 12 | 8 |
| Mean of Ln (positives) | 2.434 | 2.853 | 2.824 | 2.621 | 2.762 | 2.762 | 2.245 | 2.585 |
| Variance Ln (positives) | 0.456 | 1.126 | 0.639 | 1.060 | 1.767 | 1.767 | 0.350 | 0.593 |
| Mean catch per $10m^2$ | 4.397 | 10.802 | 4.498 | 5.066 | 10.038 | 7.310 | 1.383 | 1.790 |
| Variance | 1.524 | 4.931 | 2.306 | 2.039 | 16.095 | 8.718 | 0.196 | 0.487 |
| S. E. | 1.234 | 2.221 | 1.519 | 1.428 | 4.012 | 2.953 | 0.443 | 0.698 |
| S.E./Mean | 0.281 | 0.206 | 0.338 | 0.282 | 0.400 | 0.404 | 0.3201 | 0.3901 |
| Survey Area x $10^{11}$ $m^2$ | 7.327 | 7.383 | 8.78 | 3.94 | 2.209 | 3.681 | 4.624 | 4.624 |
| Larvae x $10^{12}$ (mean x area) | 3.222 | 7.975 | 3.949 | 1.996 | 2.217 | 2.691 | 0.640 | 0.828 |
| Larvae*e**(.1AGE) | 7.80 | 16.07 | 9.15 | 4.10 | 3.93 | 4.77 | 1.22 | 2.29 |
| Season (days) | 60 | 60 | 60 | 60 | 39 | 56 | 60 | 60 |
| Age, mean (days) | 8.842 | 7.007 | 8.402 | 7.191 | 5.723 | 5.723 | 6.457 | 10.200 |
| Mean Length (mm) | 4.6 | 4.1 | 4.48 | 4.15 | 3.75 | 3.75 | 3.95 | 4.97 |
| P=LxS/A ($\times 10^{11}$)[3] | 21.862 | 68.290 | 28.204 | 16.655 | 15.112 | 26.332 | 5.943 | 4.868 |
| Number of Spawners[4] | 155353 | 403925 | 191785 | 100338 | 78611 | 136978 | 33270 | 39623 |
| Biomass tons (242kg/fish) | 37596 | 97750 | 46412 | 24282 | 19024 | 33149 | 8051 | 9589 |

1. Survey in 1983 was incomplete. Low estimate is based on the observed sampling. The high estimate assumes the normal 60-day spawning duration.
2. No survey was conducted in the Gulf of Mexico in 1985.
3. Production of larvae adjusted for length of season and age of larvae.
4. Assumes sex ratio 0.565 female and each female produces $6.03 \times 10^7$ eggs. Also adjusted for assumed mortality of 0.1/day from spawning to age of capture.

# NATIONAL REPORT OF U.S.S.R.

by

Yu. A. Vialov, V. V. Ovchinnikov, M. E. Grutsev

## 1. Fishery

In 1986, the total catch of tunas and other species of the tuna fishery amounted to 9,693 MT, among which yellowfin tuna made up 1,851 MT, bigeye tuna 1,071 MT, skipjack 1,688 MT, Atlantic black skipjack 271 MT, frigate and bullet tunas 3,465 MT, swordfish 18 MT, sailfish 2 MT, marlins 23 MT, Atlantic bonito 1,085 MT and Spanish mackerel 219 MT. In the eastern central Atlantic, the longline fishery yielded 1,540 MT (426 MT of yellowfin tuna, 1,071 MT of bigeye tuna, 18 MT of swordfish, 23 MT of marlins and 2 MT of sailfish), the purse seine fishery yielded 3,519 MT (1,425 MT of yellowfin tuna, 1,679 MT of skipjack, 271 MT of Atlantic black skipjack and 144 MT of frigate and bullet tunas) and the trawl fishery yielded 4,518 MT (3,321 MT of frigate and bullet tunas, 978 MT of bonito and 219 MT of Spanish mackerel). In the southeast Atlantic only the trawl fishery was carried out which resulted in 116 MT of tunas. Compared with 1985, the catch of tunas and related species in the eastern central Atlantic decreased: yellowfin tuna by 1,917 MT, Atlantic black skipjack by 769 MT, frigate and bullet tunas by 2,590 MT, swordfish by 55 MT and bonito by 988 MT. This can be explained by a decrease in fishing effort in the purse seine and trawl fisheries. The trawl catches in the southeast Atlantic decreased 92 MT.

## 2. Scientific research

During the period considered, the analysis of a series of long-term catches (1982-1986) of tunas caught by the purse seine in the eastern central Atlantic was made; the species composition of the catches, the dynamics of the size and age composition of the fish and annual fluctuations of the catch per effort were determined.

The species composition of tunas in the purse seine catches was subjected to considerable annual fluctuations (see Figure) as well as the beginning and the end of the fishing period in the Sierra Leone waters. Annual fluctuations of the catch per effort are also characteristic of certain tuna species which can be attributed both to their accessibility to the fishery and to stock fluctuations.

No marked tendencies to the variation of the size and age composition of small tunas in the purse seine catches were observed. The bulk of the

Original report in English.

skipjack catches was made of fish 39-64 cm in length at the age of 2-3, frigate mackerel was represented by the specimens 35-45 cm in length (aged 3-4) and bullet tuna by the specimens 32-39 cm in length (aged 2-4). Catches of Atlantic black skipjack consisted mainly of fish 40-50 cm in length, 45 cm on the average. At age 1, the length of the fish ranged from 25 to 40 cm (an average of 34.3 cm), at age 2, from 33 to 48 cm (40.1 cm average), at age 3, from 37 to 54 cm (43.8 cm average), at age 5, from 49 to 64 cm (55.5 cm average) and at age 6, from 59 to 70 cm (63.5 cm average).

The conditions of formation of commercial aggregations of bigeye tuna, the object of the longline fishery, were studied in the open Gulf of Guinea in relation to seasonal cycles of intensity of the equatorial countercurrents. The studies of the functional structure of the tuna distribution area in the southern hemisphere were initiated.

Commercial bigeye tuna aggregations in the open Gulf of Guinea are formed both in zones of divergence and convergence of the currents. The prespawning and spawning fish predominate in the divergence zones, and the postspawning and immature fish prevail in the convergence zones. On the whole, there is good agreement between seasonal fluctuations of the boundaries of the area of the longline fishery for bigeye tuna and the seasonal cycles of the intensity of the equatorial countercurrents.

## 3. Works at sea

In 1986-1987, two expeditions (one to the western part of the Atlantic, and another to the southeastern part of the Atlantic) were made to collect biological materials, and two more expeditions to the eastern central Atlantic aimed at provision of commercial vessels with hydrometeorological information. Two observers--an ichthyologist and a hydrologist--worked on board commercial vessels. The collected materials include:

| | |
|---|---|
| biological analyses | 1,186 |
| samples for aging | 529 |
| samples for genetic-biochemical analysis | 154 |
| samples for feeding studies | 15 |
| samples for parasitological analysis | 216 |
| hydrological stations | 60 |

## 4. Publications

1. Batalyants, K. Ya. Some peculiarities of shoals and shoaling behavior of the little tunny (Euthynnus alletteratus Rafinesque) of the southeast Atlantic. Coll.: Life cycles, distribution and migrations of commercial fishes of the Atlantic Ocean and the Pacific. Kaliningrad, 1986, p. 22-36.

2. Ovchinnikov, V. V. Migration behavior and distant migrations of the fish. Coll.: Life cycles, distribution and migrations of commercial fishes of the Atlantic Ocean and the Pacific. Kaliningrad, 1986, p. 37-46.

Table 1. Soviet catches of tunas in the first half of 1987

| | |
|---|---|
| Yellowfin tuna | 856 |
| Bigeye tuna | 581 |
| Skipjack | 498 |
| Frigate tuna | 133 |
| Bullet tuna | 93 |
| Little tunny | 62 |
| Marlin | 9 |
| TOTAL | 2232 |

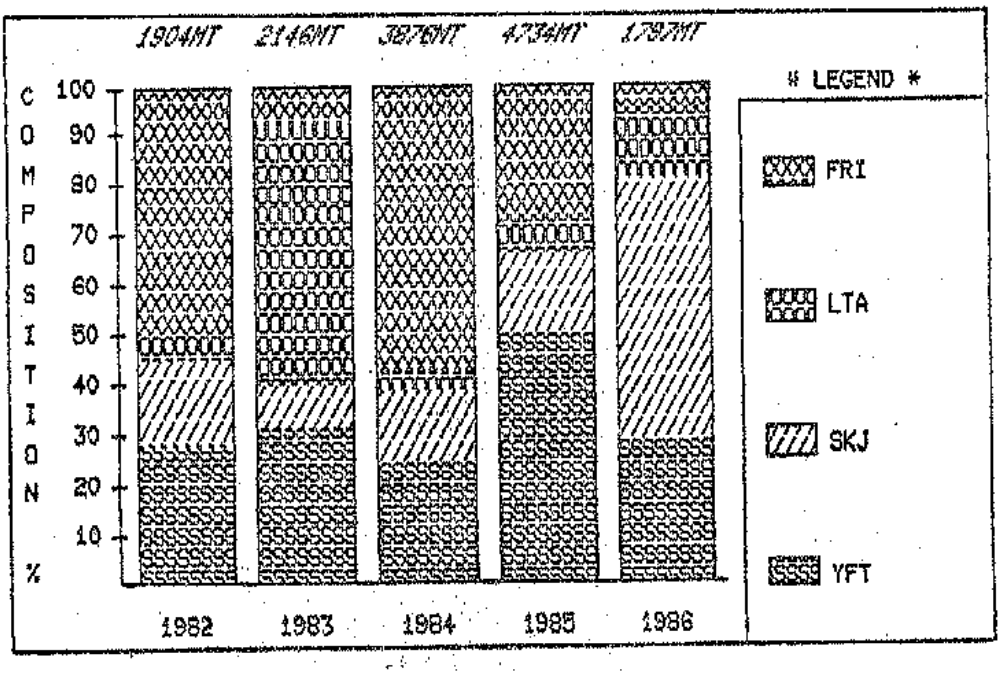


Fig. 1. Soviet catches by species, 1982-86.

# NATIONAL REPORT OF VENEZUELA

## 1. Fisheries

### 1.1 1986 catches

During 1986 the Venezuelan tuna fleet caught 76,430 MT, which represented an increase of 9.18 percent in comparison with the 1985 catches. Of the total catches, 53,416 MT (69.9 percent) corresponded to the eastern Pacific Ocean and 23,014 MT (30.1 percent) to the Caribbean Sea and Atlantic ocean.

Of the catches made in the Caribbean Sea and Atlantic Ocean, 66.85 percent were made by purse seiners, 16.18 percent by baitboats and 16.95 percent by longliners (Table 1).

The composition of the Caribbean catch by species is shown in Table 2.

During 1986, the tuna fleet was comprised of 31 purse seiners, 17 baitboats and 33 longliners.

### 1.2 1987 catches

The tuna catches made during the first quarter of 1987 reached 24,256 MT, of which 14,789 MT (61 percent) corresponded to the eastern Pacific Ocean, 9,375 MT (38.6 percent) to the Caribbean Sea and 92 MT (0.4 percent) to the Atlantic Ocean. Considering that 14 longliners were transferred to the Pacific Ocean, it is estimated that the total catches from the Caribbean Sea and Atlantic Ocean will decrease around 8.5 percent.

## 2. Research

### 2.1 Research in 1986

Within the port sampling program, 3,130 tuna were measured, of which 1,400 were skipjack (Katsuwonus pelamis), 1,680 were yellowfin (Thunnus albacares), and 50 were albacore (Thunnus alalunga).

In relation to the yellowfin tagging cruises within the framework of the Yellowfin Year Program (Joint FONAIAP-ICCAT Program), an opportunistic tagging cruise was carried out on board a commercial baitboat during October, in which 225 yellowfin tuna were tagged in the Caribbean Sea and four tags were recovered.

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Original report in Spanish.

## 2.2 Biological sampling

During the first quarter of 1987, 1,475 tuna were measured for length, of which 1,000 were Katsuwonus pelamis and 475 were Thunnus albacares.

## 2.3 Research programs for 1987

As part of the Yellowfin Year Program, during 1987 two opportunistic tagging cruises were made, tagging 61 yellowfin. The relatively low number of tagged tunas was due to the species not being present and the predominant temperatures above 28°C in the area of the Caribbean Sea.

Two intensive tagging cruises were planned for 1987, using the French research vessel "Nizery" from ORSTOM. Of these two cruises, only one was carried out due to problems of obtaining permission for this vessel to operate in Venezuelan waters. As the result of this cruise, 118 Katsuwonus pelamis were tagged. This was a decision taken two days before the end of the tagging cruise since no yellowfin were found in the area and where the surface temperatures was between 28° and 31°C. These results led us to suggest establishing a skipjack tagging program for 1988 in the Caribbean Sea and the western Atlantic Ocean.

## 2.4 Billfish

During the visit of Dr. P. M. Miyake to Venezuela in April, it was agreed to establish a "Program of intensive research on billfish" in Caribbean waters. For this program, sampling of billfish has been carried out in landing ports and cruises with observers on board longliners have been made. During August-September, one cruise was made and another one is planned for October.

Table 1. Catches of tunas in the Caribbean Sea and western Atlantic Ocean in 1986

| Gear | Catch (MT) | Percent |
|---|---|---|
| Purse seine | 14,731.09 | 66.85% |
| Baitboat | 3,565.37 | 16.18% |
| Longline | 3,737.54 | 16.95% |
| TOTAL | 22,034.00 | |

Table 2. Catches of tunas in the Caribbean Sea by species in 1986

| Species | Percent |
|---|---|
| Skipjack | 41.4 |
| Yellowfin | 47.4 |
| Frigate tuna | 8.9 |
| Bigeye tuna | 1.5 |
| Albacore | 0.1 |
| Blackfin tuna | 0.7 |