INTERNATIONAL COMMISSION
for the
CONSERVATION of ATLANTIC TUNAS

R E P O R T
for biennial period, 1982-83
PART II (1983)
English version

MADRID, SPAIN 1984

INTERNATIONAL COMMISSION FOR THE CONSERVATION OF ATLANTIC TUNAS

Member Countries (as of April 1, 1984)

Angola, Benin, Brazil, Canada, Cape Verde, Cuba, France, Gabon, Ghana, Ivory Coast, 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, 1984)

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

Council

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

Standing Committees

Standing Committees:	Chairman
Committee on Finance and Administration (STACFAD)	Mr. J. J. CHAO, Spain (from November 15, 1983)
Committee on Research and Statistics (SCRS)	Mr. J. S. BECKETT, Canada (from November 17, 1981)

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

LETTER OF TRANSMITTAL

The Chairman of the International Commission for the Conservation of Atlantic Tunas presents his compliments to the Member Governments to the Convention for the Conservation of Atlantic Tunas (signed in Rio de Janeiro, May 14, 1966), and to the Delegates and Advisers representing said Governments, and has the honor to transmit the ***"Report for the Biennial Period, 1982-83, Part II (1983)"***, describing the activities of the Commission during the second half of said biennial period.

The volume contains reports of the Eighth Regular Meeting of the Commission, held in November, 1983, 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.

L. Coffi
Commission Chairman

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CHAPTER I
Secretariat Reports

ADMINISTRATIVE REPORT 1983

COM/83/10 (Amended)*

1. Member countries of the Commission

Since the last meeting (November, 1982) three countries (Uruguay, Sao Tomé and Principe and Venezuela) became Contracting Parties of the Commission. Consequently, ICCAT is currently comprised of twenty-two (22) member countries.

Uruguay and Sao Tome and Principe deposited instruments of adherence with the Food and Agriculture Organization of the United Nations (FAO) on March 16 and September 15, 1983, respectively. Venezuela deposited an instrument of ratification with FAO on November 17, 1983.

2. Meetings organized by ICCAT

2.1 Skipjack Conference

The International Skipjack Year Program, which began in 1979, ends in 1983. As a conclusion to the scientific work, a conference was held from June 21 to 29, 1983, at the "Centro Costero de Canarias", at the invitation of the "Instituto Español de Oceanografía" (I.E.O.).

A total of 46 scientists from 17 member countries, two non-member countries and two international organizations participated in the Conference. ICCAT paid for round-trip tickets for one scientist attending from each member country, and for two guest speakers. Drs. O. Rodríguez-Martín, P. M. Miyake, P. E. K. Symons and J. Wise, as well as two secretaries participated in the Conference.

During the first half of the Conference, some 46 scientific documents, which reported results and analyses of findings of the International Skipjack Year Program, were presented and reviewed.

The latter half of the Conference was devoted to panel discussions designed to answer the four basic questions posed by the Commission at the beginning of the Skipjack Program.

The "Centro Costero" provided all types of facilities for holding the Conference and assumed expenses for materials, photocopying services, coffee break, etc.

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

2.2 SCRS Officers Meeting

Taking advantage of many SCRS Officers' presence at the Skipjack Conference, a meeting was held in Tenerife during the Conference period. At that time the Officers reviewed progress made by scientists during the first half of the year, decided on the overall organization of the 1983 SCRS Meeting, nominated species rapporteurs, and discussed some pending problems and future plans. The Report of the Officers Meeting was presented as document SCRS/83/7.

2.3 Working Group on Juvenile Tropical Tunas

The Working Group on Juvenile Tropical Tunas met for a short period during the Skipjack Conference in June, 1983, in Tenerife. The Group confirmed the working plan devised during the 1982 SCRS session. However, some countries expressed some delays in the preparation of the basic data base and the Group decided to postpone its 1984 meeting until the first week of July. The Group's Report can be found in Appendix 4 to Annex of the 1983 Commission Meeting Report.

2.4 Data Preparatory Meeting for the Bluefin Workshop

Bluefin scientists held a data preparatory meeting at the laboratory of the "Libera Universitá di Trapani" in Trapani, Sicily (Italy), at the invitation of the University. Eleven scientists from seven countries met and reviewed available bluefin catch and size data. In order to create catch-by-size tables which include all the fisheries, the Group tried to match the catch data with corresponding size data or with substituted size data. The work of dividing the catches by size according to the agreed matched size data was carried out by national scientists and by the Secretariat. The results were attached to the Bluefin Workshop Report (SCRS/83/15). Dr. P. M. Miyake and a secretary participated in the preparatory meeting from the Secretariat.

2.5 Bluefin Workshop

The Bluefin Workshop was held on August 31-September 8, 1983, in Japan, at the invitation of the Japanese Government. Seventeen scientists from five countries participated in the Workshop. The Assistant Executive Secretary participated from the Secretariat.

The first half of the session was held in Tsukuba, at the Office of the Ministry of Agriculture, Forestry, and Fisheries where computer facilities were made available. The data prepared by the Secretariat had been transferred to this computer before the meeting. Discussions centered on the creation of a common data base (catch-by-size) and the examination of the feasibility of applying various analyses to this data base. The data base already prepared was modified slightly and agreed upon.

The latter half of the session was held at the Far Seas Fisheries Research Laboratory (Shimizu) and the feasibility of applying various analytical techniques to the present data was discussed. Dr. W. G. Doubleday (Canada) was invited by Japan as a special guest

speaker. The Bluefin Workshop Report was presented to the Commission; the text can be found in Appendix 7 to Annex 10 of the 1983 Commission Meeting Report.

Computer facilities, conference rooms, transportation between Tsukuba and Shimizu, coffee break, document reproduction and other minor expenses were assumed by the Japanese Government.

3. Meetings at which ICCAT was represented

3.1 International Commission for the Southeast Atlantic Fisheries (ICSEAF)

ICSEAF held its Tenth Session in December, 1982, in Tenerife, Spain. The Executive Secretary attended the Commission session.

3.2 FAO Committee on Fisheries (COFI)

The Executive Secretary attended the COFI meeting held at the FAO Headquarters in Rome, October 10-15, 1983.

3.3 CWP Inter-Agency Meeting

The Coordinating Working Party on Atlantic Fishery Statistics, of which ICCAT is a member, held an inter-agency consultation meeting on October 8-9, 1983, at Gothenburg, Sweden, during the ICES Meeting. The Assistant Executive Secretary attended the meeting.

3.4 CRO-Dakar Regional Skipjack Meeting

A second regional work meeting on results from the Skipjack Program was held at the CRO-Dakar-Thiaroye, Senegal, March 21-26, 1983. Three members of the Secretariat staff attended this meeting: the Skipjack Coordinator (P. Symons), the Biostatistician (J.P. Wise) and the Systems Analyst (V. Nordstrom). The meeting enabled integration of results from eight different countries (Cape Verde, France, Ghana, Ivory Coast, Japan, Portugal, Senegal and Spain) involved in skipjack research in the east Atlantic.

4. Collaboration with other organizations

4.1 FAO

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

Close working relationships were also maintained with other organizations of the FAO Fisheries Department, such as the FAO Fishery Committee for the Eastern Central Atlantic (CECAF), the General Fisheries Council for the Mediterranean (GFCM), the Indo-Pacific Fisheries Council (IPFC), the Indian Ocean Fisheries Commission (IOFC) and the tuna statistical field program in the western Pacific-Indian Ocean region.

4.2 Other organizations

The Commission also collaborated with the following international organizations:

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

5. Coordination of Research

The coordination of research carried out by the Secretariat during 1983 is summarized in the "Secretariat Report on Research and Statistics" (SCRS/83/22).

6. Statistical Training Courses

A statistical training course was held in Abidjan, Ivory Coast, April 18-27, 1983, and a second course was held in Santa Cruz, Tenerife, Canary Islands, Spain, June 27-July 6, 1983 (SCRS/83/18). All Atlantic developing member countries were represented at these courses. It was decided to postpone training requested by Korea until a later date.

The courses were directed primarily at principles of statistics and sampling, particularly as they apply to tuna fisheries. Principles of collection of statistics and techniques of sampling at sea and in port were reviewed in detail. Each trainee had several opportunities to observe and participate in actual sampling of tunas being unloaded at the local fishing port.

Thirty-three trainees from 15 countries attended the two courses. Fifteen trainees from six ICCAT member countries (Angola, Benin, Gabon, Ghana, Morocco, Senegal) and two non-member countries (Congo and Guinea) participated in the first training course. (CECAF member countries had also been invited to send trainees to the Abidjan course.) Eighteen trainees from eight ICCAT member countries (Angola, Brazil, Cape Verde, Cuba, Gabon, Portugal, Spain and Uruguay) and one non-member (Costa Rica) participated in the second training course.

ICCAT provided for travel and per diem of the instructors from the Secretariat and for one trainee from each of the developing member countries. CECAF paid expenses for two trainees from its member countries, and the EEC paid expenses for four other participants. The "Centre de Recherches Océanographiques" at Abidjan provided physical facilities for the first course and the "Centro Costero de Canarias" of the "Instituto Español de Oceanografía" at Santa Cruz, provided physical facilities for the second course. Messrs. J. B. Amon Kothias, F. X. Bard and H. Farrugio of the CRO and A. González-Garcés and Al. Santos Guerra of the I.E.O. served as instructors in addition to P. M. Miyake and J. P. Wise of the Secretariat.

7. Publications

The following publications were issued in 1983:

a) Biennial Report, 1982-83, Part I (English, French and Spanish)

b) Statistical Bulletin, Vol. 12 (1981) (Final Edition)

c) Statistical Bulletin, Vol. 13 (1982) (Preliminary Edition)

d) Collective Volume, Vol. XVIII (1-4) (Report A and 1982 SCRS documents)

e) Data Record, Vol. 21 (Data received from November, 1982, to February, 1983)

f) Data Record, Vol. 22 (Data received from March to September, 1983)

g) Statistical Series-11 (ICCAT port sampling, 1981 and 1982)

h) Newsletter (4 issues)

The scientific papers presented at the Skipjack Conference will be published in a special volume which is scheduled for distribution soon after June, 1984. This is being prepared under contract with the past coordinator of the Program, Dr. P. E. K. Symons, through the consultant company he has joined in Canada. He will be assisted by Drs. P. M. Miyake (ICCAT Secretariat) and G. T. Sakagawa (U.S.A.), Convener of the Sub-Committee on Skipjack. The approved draft reports from the Skipjack Conference Panel discussions were revised, and presented at the 1983 SCRS meeting to officially end the Program.

8. Secretariat and Administration

8.1 Staff

Dr. P. E. K. Symons (Program Coordinator) and D. Magermans (secretary) left the Commission upon termination of the Skipjack Program. However, as mentioned in the previous section, Dr. Symons will work with the Commission under contract to prepare the special Skipjack Conference publication.

The contract with J. P. Wise, ICCAT biostatistician, was extended for two more years.

8.2 Trips

Besides those trips made by the Secretariat staff to attend meetings mentioned in Sections 4 and 5 of this Report, the following trips were also made:

a) Executive Secretary

The Executive Secretary was officially invited by the Spanish authorities to attend the inauguration of the "Centro Costero de Canarias" of the "Instituto Español de Oceanografía" (I.E.O.) in Tenerife, April 8, 1983.

The Executive Secretary took advantage of this opportunity to discuss ICCAT activities with Spanish authorities. He met with Mr. O. Cendrero, Director of the I.E.O., and Mr. J. Bravo de Laguna, Director of the Center, to discuss many items concerning the organization of the Skipjack Conference and the ICCAT Training Course in Statistics and Sampling, both of which were held at the Tenerife Laboratory.

b) Assistant Executive Secretary

In March, the Assistant Executive Secretary visited Dutch Antilles, Venezuela, Brazil and Uruguay. He successfully reconstructed the ICCAT port sampling system in St. Maarten, Venezuela and Uruguay. In Venezuela, he obtained recent statistics for that country and discussed the development of the sampling system. In Brazil, the new skipjack sampling system was reviewed with Brazilian scientists, and a program for reporting Skipjack Program results was studied. In Uruguay, the Assistant Executive Secretary met with government scientists and discussed sampling techniques for the new developing national longline fleet.

8.3 Office automation alternatives

Following a request made by the SCRS, the Secretariat prepared a document (SCRS/83/23) in which the feasibility of purchasing mini-computer/word processors for the Secretariat was studied and the results of an extensive comparison of various models available on the market were presented.

After the SCRS and the Commission authorized the purchase of such a system, DECmate word processors and a micro-computer (PC-100), both manufactured by the Digital Corporation, were purchased. The system installed at the Secretariat consists of seven DECmate units, three letter quality printers and one dot matrix printer.

FINANCIAL REPORT 1983

COM/83/11 (Amended)*

REGULAR COMMISSION BUDGET

I. FISCAL YEAR 1982

1. Auditor's Report for Fiscal Year 1982

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

2. Financial status at the end of Fiscal Year 1982

Statement 1 presents the balance sheet up to the end of Fiscal Year 1982. There was a balance of $727,174.74 in Cash and Bank, broken down as follows: $550,953.45 corresponding to the Regular Commission Budget and $176,221.29 corresponding to the Skipjack Budget.

Contributions pending payment total $153,774.21. Of this amount, $121,224.68 correspond to the Regular Commission Budget and $32,549.53 correspond to the Skipjack Budget.

II. FISCAL YEAR 1983

1. Regular Commission Budget - 1983

The 1983 Regular Commission Budget was approved by the Commission at its

*Updated to the end of Fiscal Year 1983. Modifications agreed upon by the Commission have been included.

Seventh Regular Meeting (Tenerife, November 1981) and amounted to $825,000. (See Biennial Report, 1980-81, Part II, Appendix 3 to Annex 7.)

Due to the fluctuation of the U.S. dollar/peseta, we were able to maintain the budget at the same level as that for 1981, with a 10 percent increase for 1983. During the past year, the revaluation of the dollar continued which resulted in favorable repercussions in almost all of the budget chapters.

2. Review of Commission accounts

Statement 2 shows the current status of the member country contributions for 1983. There is a total of $230,620.83 pending payment from Benin, Brazil, Cuba, Gabon, Ghana, Ivory Coast, Morocco and Senegal corresponding to the 1983 Regular Budget and to amounts pending from other years.

Statement 3 shows the Budget, Expenditures and Balance for Fiscal Year 1983. There is a positive balance of $209,765.30. The Commission decided that this balance should be deposited to the Working Capital Fund.

We should point out that the amount corresponding to the positive balance is not actually available since there is $230,620.83 pending payment.

3. General comments by Budget chapter

Chapter 1 - SALARIES

The effect of the fluctuation in the U.S. dollar/peseta exchange rate resulted in a substantial positive balance ($110,146.29) in this budget chapter, since there were no increases in salary scales. On the contrary, there have been notable decreases in dollar amounts.

Chapter 2 - TRAVEL

Trips made by the Secretariat staff are described in the Administrative Report (COM/83/10).

Trips made by the Executive Secretary to Tenerife to attend the Skipjack Conference, to Rome to attend the COFI (FAO) meeting and to Alicante (Spain) to attend the ICSEAF meeting were charged to this budget chapter.

Also included are the trip expenses of the Assistant Executive Secretary to attend the Skipjack Conference in Tenerife, the CWP meeting in Gotemburg (Sweden), the ICSEAF meeting in Alicante (Spain). Home leave expenses for the Assistant Executive Secretary and his family to Japan were charged to this chapter. The former trip was combined with his attendance at the Bluefin Workshop held in Japan as well as his participation in a tuna experts meeting held in La Jolla, California.

This chapter shows a positive balance of $1,974.19.

Chapter 3 - ANNUAL MEETING

The expenses charged to this budget chapter were as follows:

i) ICCAT Secretariat staff (meals, local transportation, transport of equipment and materials)	$ 7,848.00
ii) Simultaneous translation	8,702.00
iii) Extra staff (3 multi-lingual translators, 1 receptionist, and 1 copy machine operator)	5,589.00
iv) Hotel conference rooms, working rooms, coffee break and miscellaneous	11,286.00
v) Electronic equipment for simultaneous translation	4,818.00
vi) 2 copy machines	4,595.72
vii) Office materials & other misc. expenses	2,775.00
TOTAL	$45,613.72

This chapter shows a substantial positive balance of $31,386.28. We should point out that due to the high proficiency level of the Secretariat staff, less extra staff is required for the meetings. Besides, the excellent financial conditions provided by the hotel for the meeting helped reduce costs considerably.

Chapter 4 - PUBLICATIONS

The Commission publications outlined in the Administrative Report (COM/83/10) have been charged to this budget chapter. There is a positive balance of $13,467.74.

Chapter 5 - OFFICE EQUIPMENT

The purchase of a telephone switchboard unit (TELENORMA) installed at the Secretariat offices, which amounted to $7,188.23, was charged to this budget chapter.

Other expenditures charged to this chapter ($2,966.01) include the purchase of auxiliary office furniture, a cassette recorder, as well as monthly installments on two leased photocopy machines. This chapter shows a negative balance of $2,454.24.

Chapter 6 - GENERAL OPERATING EXPENSES

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

i) Office material	$ 4,304.00
ii) Duplication of documents	8,424.00
iii) Mailing	11,631.00

iv) Telephone	3,102.00
v) Telex and telegram	4,995.00
vi) Equipment maintenance	3,826.00
vii) Auditor's fees	1,200.00
viii) Security bond	932.00
ix) Electricity	4,688.00
x) Office cleaning service	2,155.00
xi) Miscellaneous expenses	11,120.54
TOTAL	$56,377.54

The Secretariat offices had been located on both the 7th and the 3rd floors at Principe de Vergara, no. 17. However, this past year additional office space became available on the 7th floor, so the 3rd floor offices were moved to this new space. As a result, some reforms had to be done to the overall 7th floor offices (i.e. electrical installation, plumbing, painting, carpentry, etc.) and these expenses amounted to $11,120.54, and were charged to the "Miscellaneous Operating Expenses" chapter of the budget. This Chapter shows a positive balance of $5,222.46.

Chapter 7 - MISCELLANEOUS

This chapter includes such expenses as minor repairs, local transportation for office business and, in general, other miscellaneous expenses which are not applicable to other budget chapters.

Chapter 8 - COORDINATION OF RESEARCH

a) Staff

This sub-chapter includes the salaries of the biostatistician, the systems analyst and two statistical assistants. It also includes the expenses incurred ($12,693.92) by the port samplers at Tenerife, Las Palmas, St. Maarten, Cape Town, Cumaná and Montevideo. This sub-chapter shows a positive balance of $65,387.52, due to the same reasons noted in the comments to Chapter 1 of the budget.

b) Travel

Trips made by the biostatistician and the systems analyst to Dakar (Senegal), trips by the Assistant Executive Secretary to South America and Trapani (Italy), as well as one secretary's trip to Trapani, have been charged to this sub-chapter.

c) Equipment

These expenses correspond to office material and equipment acquired for the statistics department. We would like to point out the purchase of a Digital PC 100 PLUS

and corresponding accessories, which totaled $8,010.95. As a result, this sub-chapter shows a negative balance of $3,650.65. The purchase of this equipment was approved by the Commission at its Eighth Regular Meeting (Madrid, November, 1983).

d) Data processing

Data processing costs have remained well within the amount budgeted, in spite of the considerable increase in processing work. As a result, there is a positive balance of $19,012.73.

e) Meetings during the year

Expenses ($20,057.20) for the two statistical training courses (Aibdjan and Tenerife), as well as expenses of the data preparatory meeting held in Trapani ($1,002.08) and those for the Bluefin Workshop held in Japan ($6,271.55) were charged to this budget sub-chapter. There is a negative balance of $930.83 in this budget sub-chapter.

f) Miscellaneous

Included in this sub-chapter are two lottery prizes, tag rewards and some expenses for bluefin sampling.

The costs for the collection, packing and air freight of bluefin samples to IATTC in La Jolla, California, amounted to $4,138.89. Of this amount, $2,520.70 which the U.S. had deposited in the bluefin tagging fund ($1,998.46) and the bluefin sampling fund ($522.24) was applied to cover these expenses. Therefore, the amount actually charged to the Commission was $1,618.19.

Chapter 9 - CONTINGENCIES

Included in this chapter was the purchase ($43,255.08) of a micro-computer/word processing system (Digital DECmate II) for the Secretariat. The system includes 7 DECmates (central unit, keyboard, screen and software for each unit) as well as three letter-quality printers. This system adequately meets the needs of the Secretariat. The purchase was approved by the Commission at its Eighth Regular Meeting (Madrid, November, 1983).

4. Income and Disbursements for the Regular Budget

Statement 4 shows the Income and Disbursements corresponding to Fiscal Year 1983.

5. Balance Sheet for the Regular Budget

Statement 5 shows the assets and liabilities at the end of the Fiscal Year. There is $712,973.20 in Cash and Bank and $230,620.83 pending payment.

6. Breakdown of the Working Capital Fund

Statement 6 shows the status of the Working Capital Fund, including the following deductions from the Fund:

i) Applied to the 1984 Regular Commission Budget	$100,000.00
ii) Contributions pending payment.	230,620.83

Consequently, there were $612,973.20 available in the Working Capital Fund at the end of Fiscal Year 1983.

SKIPJACK BUDGET

1. Background

The Commission reviewed the financial aspect of the Skipjack Program at its 1978 and 1979 meetings and approved the budget as well as the corresponding member country contributions for each year of the Program.

The total budget by year broken down by chapters according to Program activities and ICCAT coordination services is contained in the Biennial Report, 1978-79, Part II, Appendix 5 to Annex 6. The overall total budget approved for the Program amounted to $552,350.

The member country contributions for each year of the Program are given in the Biennial Report, 1978-79, Part II, Appendix 6 to Annex 6. Only those countries which were members of the Commission in 1978 (i.e. 18 countries) contributed to the budget. Countries which joined the Commission after 1978 were not included in the budget.

2. Financial status at the end of the Skipjack Program

At the end of each Fiscal Year since 1979, the year the Program started, the Commission has reviewed the corresponding Financial Report. Besides, the Auditor examined each year the accounts and financial status of the skipjack budgets.

At the end of Fiscal Year 1982, the year the Program came to a close, the skipjack budget accounts showed a substantial positive balance ($176,221.29), deposited in the Working Capital Fund. Besides, there were contributions pending payment which totaled $32,549.53. (*Statement 1*).

Therefore, upon termination of the four-year Program, the skipjack budget had a potential balance of $208,770.82 from the accumulated balances of the various annual Program budgets.

3. Income, expenditures and balance of the 1983 Skipjack Budget

An additional Skipjack Program Budget was approved for 1983 by the Commission at its 1981 Meeting, and this budget was later revised at the 1982 Commission Meeting (see Biennial Report, 1982-83, Part I, Appendix 2 to Annex 9). The budget amounted to $200,000 and covers expenses until the end of all Program activities, which is scheduled for June-July, 1984.

The Commission decided not to request new contributions to meet this additional budget. Instead, it agreed to apply reserves from the Skipjack Working Capital Fund, increased by the contributions pending payment at the end of 1982.

Statement 7 shows the contributions pending from other years which were paid in 1983 ($19,938.83), as well as contributions still pending payment ($12,610.70).

Statement 8 shows the budget, expenditures and balance of the skipjack budget. As of the end of 1983, expenditures totaled $123,545.84. Expenses to the end of Program activities are estimated at $53,331.56. Therefore, total expenses for the overall Program will amount to $176,877.40. There is a positive balance foreseen of $23,122.60 of the $200,000 budget approved for 1983.

4. General comments by Skipjack Budget chapter

Chapter 1 - SALARIES

Salaries of the Program Coordinator and one secretary, both up to August 31, 1983, are included in this chapter. Expenses incurred by the Dobrocky Seatech Ltd., under contract to prepare the skipjack publication, will be charged to this chapter.

Chapter 2 - OFFICE EQUIPMENT & MATERIALS

There were no expenses charged to this chapter in 1983.

Chapter 3 - TRIP EXPENSES

The Program Coordinator's trip to attend a working meeting in Dakar, Senegal, as well as his return trip to Canada were charged to this chapter. Estimated expenditures include air fair for the Coordinator's family to Canada.

Chapter 4 - OPERATIONAL EXPENSES & CONTRACTS

Expenditures charged to this chapter include reproduction of skipjack documents, mailing of tagging materials, T-shirts and lottery prizes. Budgetary provision has been made for translation and typing work done at the Secretariat on Skipjack Program documents.

Chapter 5 - SKIPJACK CONFERENCE

Expenses incurred by the Skipjack Conference, held in Tenerife in June, 1983, were as follows:

a) Facilities	
i) Simultaneous translation	$ 8,400.00
ii) Electronic equipment for translation	4,545.00
iii) Travel, per diem, transport of materials (Program Coordinator and 2 secretaries)	5,717.64
Sub-total	$18,662.64
b) Travel	
i) Invitational (2 scientists: round trip fare)	$ 6,155.00
ii) Member scientist (round trip fare for 16 participating member countries) (Spain relinquished this benefit since the Conference was held in Tenerife)	21,960.29
Sub-Total	28,115.29
TOTAL	$46,777.93

Chapter 6 - PUBLICATION

We expect to spend the total amount budgeted for the special skipjack publication.

5. Income and expenditures

Statement 9 shows the income and expenditures during Fiscal Year 1983. As was noted earlier, $19,938.83 correspond to contributions which were pending payment from other years.

Therefore, the funds available to cover this budget amount to $196,991.81 as of the end of 1983.

Statement 10 shows the Balance Sheet as of December 31, 1983. There is a total of $73,445.97 in Cash and Bank. Expenses forecast to the end of all Program activities amount to $53,331.56. Therefore, we anticipate a positive balance of $20,114.41, based on the funds available ($196,991.81). We would like to point out, however, that this positive balance increases to $23,122.60, based on the budget approved ($200,000).

On the other hand, there are still $12,610.70 pending payment to the Skipjack Budget.

At its Eighth Regular Meeting (Madrid, November, 1983) the Commission decided that the balance of Skipjack Program funds would be deposited to the Working Capital Fund of the Regular Commission Budget

Statement II shows the balance sheet of both the Regular Commission Budget and the Skipjack Budget at the end of Fiscal Year 1983.

STATEMENT 1

Balance Sheet – Regular and Skipjack Budgets – 1982 (US$)

ASSETS			*LIABILITIES*		
Cash and Bank:			Working Capital Funds:		
a) Regular Budget	550,953.45		a) Regular Budget	669,623.69	
b) Skipjack Budget	176,221.29	727,174.74	b) Skipjack Budget	208,770.82	878,394.51
Pending Contributions:			Bluefin Tagging Fund		1,998.46
a) Regular Budget	121,224.68				
b) Skipjack Budget	32,549.53	153,774.21	Advance for bluefin sampling		522.24
			In favor of Cuba:		
			– Regular Budget		33.74
TOTAL		880,948.95	TOTAL		880,948.95

STATEMENT 2

Status of Member Country Contributions in 1983 - Regular Commission Budget (US$)

Country	*1982 Balance*	*Contributions for 1983, approved by the Commission*	*Contributions paid towards the 1983 Budget*	*Other Contributions*	*Balance*
Angola	---	24,815	24,815.00	---	---
Benin	- 14,650.00	5,577	---	---	- 20,227.00
Brazil	- 22,828.00	25,871	---	22,828.00	- 25,871.00
Canada	---	20,748	20,748.00	---	---
Cape Verde	---	13,109	13,109.00	---	---
Cuba	+ 33.74	28,258	14,917.94	---	- 13,306.32
France	---	123,920	123,920.00	---	---
Gabon	- 5,609.41	11,155	---	---	- 16,764.41
Ghana	- 16,515.27	35,007	---	---	- 51,522.27
Ivory Coast	- 5,320.40	32,370	12,759.95	5,320.40	- 19,610.05
Japan	---	76,711	76,711.00	---	---
Korea	---	63,957	63,957.00	---	---
Morocco	- 18,212.00	19,856	---	---	- 38,068.00
Portugal	---	36,396	36,396.00	---	---
Senegal	- 38,089.60	15,439	---	8,276.82	- 45,251.78
South Africa	---	21,961	21,961.00	---	---
Spain	---	169,877	169,877.00	---	---
United States	---	69,751	69,751.00	---	---
U.S.S.R	---	30,222	30,222.00	---	---
TOTAL	- 121,224.68 + 33.74	825,000	679,144.89	36,425.22	- 230,620.83

STATEMENT 3

Budget, Expenditures and Balance of the Regular Commission Budget for Fiscal Year 1983 (US$)

Chapter	*I* *Amount Budgeted*	*II* *Actual Expense*	*III* *Difference*
1. Salaries	343,200.00	233,053.71	+ 110,146.29
2. Travel	17,600.00	15,625.81	+ 1,974.19
3. Annual Meeting	77,000.00	45,613.72	+ 31,386.28
4. Publications	38,500.00	25,032.26	+ 13,467.74
5. Office Equipment	7,700.00	10,154.24	- 2,454.24
6. Operating Expenses	61,600.00	56,377.54	+ 5,222.46
7. Miscellaneous	6,600.00	6,038.67	+ 561.33
Sub-total	*552,200.00*	*391,895.95*	+ *160,304.05*
8. Coordination of Research			
a) Staff	171,600.00	106,212.48	+ 65,387.52
b) Travel	17,600.00	10,738.71	+ 6,861.29
c) Office Equipment	7,700.00	11,350.65	- 3,650.65
d) Data Processing	37,400.00	18,387.27	+ 19,012.73
e) Meetings during the year (Sub-committees, Working Groups, etc.)	26,400.00	27,330.83	- 930.83
f) Miscellaneous	5,500.00	6,063.73	- 563.73
Sub-total	*266,200.00*	*180,083.67*	+ *86,116.33*
9. Contingencies	6,600.00	43,255.08	- 36,655.08
TOTAL	825,000.00	615,234.70	+ 209,765.30

STATEMENT 4

Statement of Income and Disbursements of the Regular Commission Budget for 1983 (US$)

INCOME				*DISBURSEMENTS*		
Cash and Bank at end of Fiscal Year 1982:				From 1983 Regular Budget	615,234.70	
-- Regular Budget		548,432.75		Bluefin Tagging/Sampling Funds	2,520.70	617,755.40
-- Bluefin Tagging Fund	$1,998.46					
-- Bluefin Sampling Fund	522.24	2,520.70	550,953.45	Balance in Cash and Bank		712,973.20
Contributions:						
-- 1983 Regular Budget			679,144.89			
-- From other years			36,425.22			
-- Non-budgeted (Sao Tomé and Principe)*			988.87			
Bank Interest - 1983*			63,206.83			
Sale of ICCAT publications*			9.34			
TOTAL			1,330,728.60	TOTAL		1,330,728.60

* To the Working Capital Fund.

STATEMENT 5

Balance Sheet of the Regular Commission Budget 1983 (US$)

ASSETS		*LIABILITIES*	
Cash and Bank	712,973.20	Available in Working Capital Fund	612,973.20
Contributions pending payment	230,620.83	Applied to the 1984 Budget	100,000.00
		Contributions pending payment	230,620.83
TOTAL	943,594.03	TOTAL	943,594.03

STATEMENT 6

Breakdown of the Working Capital Fund (US$)

At the end of Fiscal Year 1982	669,623.69	
Bank Interest – 1983	63,206.83	
Sale of ICCAT Publications	9.34	
Non-budgeted contribution (Sao Tomé & Principe)	988.87	
Positive Balance - Fiscal Year 1983	209,765.30	943,594.03
Deductions:		
-- Applied to the 1984 Budget	100,000.00	
-- Contributions pending payment	230,620.83	- 330,620.83
Available in the Working Capital Fund		*612,973.20*

STATEMENT 7

Status of Member Country Contributions in 1983 - Skipjack Budget (as of December 31, 1983) (US$)

1983 Budget - $200,000

Country	*1982 Balance*	*Contribution for 1983**	*Pending Contributions paid in 1983*	*Balance*
Angola	---	0	---	---
Benin	- 3,044.70	0	---	- 3,044.70
Brazil	- 2,708.00	0	2,708.00	---
Canada	---	0	---	---
Cuba	---	0	---	---
France	---	0	---	---
Gabon	- 860.00	0	---	- 860.00
Ghana	- 4,800.00	0	---	- 4,800.00
Ivory Coast	- 8,873.83	0	8,873.83	---
Japan	---	0	---	---
Korea	---	0	---	---
Morocco	- 3,906.00	0	---	- 3,906.00
Portugal	---	0	---	---
Senegal	- 8,357.00	0	8,357.00	---
South Africa	---	0	---	---
Spain	---	0	---	---
U.S.A.	---	0	---	---
U.S.S.R.	---	0	---	---
TOTAL	- 32,549.53	0	19,938.83	- 12,610.70

*Funds for the 1983 Skipjack Budget ($200,000) were taken from the Working Capital Fund of the Skipjack Budget. Therefore, no contributions were solicited from the member countries in 1983.

STATEMENT 8

Budget, Expenditures and Balance of the Skipjack Budget for Fiscal Year 1983 (US$)

Chapter	*I* *1983 Budget*	*II* *Expenditures up to the end of 1983*	*III* *Expenditures forecast to the end of Program activities*	*IV* *Total expenditures*	*V* *Balance*
1. Salaries	65,200	59,563.38	5,636.62 *	65,200.00	0
2. Office equipment & material	0	0	0	0	0
3. Trip expenses	10,000	11,099.47	3,000.00	14,099.47	- 4,099.47
4. Operational expenses and contracts	20,000	6,105.06	13,894.94	20,000.00	0
5. Skipjack Conference					
a) Facilities	30,000	18,662.64	0	18,662.64	+ 11,337.36
b) Travel					
i) Invitational	6,000	6,155.00	0	6,155.00	- 155.00
ii) Member scientist	38,000	21,960.29	0	21,960.29	+ 16,039.71
6. Publication					
a) Printing and binding	25,000	0	25,000.00	25,000.00	0
b) Art work	5,800	0	5,800.00	5,800.00	0
7. Miscellaneous	0	0	0	0	0
TOTAL	200,000	123,545.84	53,331.56	176,877.40	+ 23,122.60

*Includes contract with Dobrocky Seatech Ltd. for skipjack publication.

STATEMENT 9

Statement of Income and Disbursements – Skipjack Budget (US$)

INCOME		*EXPENDITURES*	
Cash and Bank at end of Fiscal Year 1982	176,221.29	Up to the end of 1983	123,545.84
Income corresponding to other years.	19,938.83	Balance in Cash and Bank	73,445.97
Sale of T-shirts	187.69		
Contribution by Japan for tag recovery rewards	644.00		
TOTAL.	196,991.81	TOTAL.	196,991.81

STATEMENT 10

Balance Sheet of the Skipjack Budget 1983 (US$)

ASSETS		*LIABILITIES*	
Cash and Bank	73,445.97	Expenses forecast to the end of Program activities	53,331.56
Contributions pending payment	12,610.70	Balance based on funds available ($196,991.81)	20,114.41
		Contributions pending payment	12,610.70
TOTAL	86,056.67	TOTAL	86,056.67

STATEMENT 11

Balance Sheet at Close of Fiscal Year 1983 — Regular Commission Budget and Skipjack Budget (US$)

ASSETS			*LIABILITIES*	
Available:			*Acquired holdings*	201,676.13
BANCO EXTERIOR DE ESPAÑA				
C/84-31279-Z (time deposit)		713,536.25		
C/A 82-31279-Q (US$)		33,369.32	*Available in the Working Capital Fund*	612,973.20
C/A 30-17632A (Ptas.)	6,406,198.53			
C/A 30-17329F (Convert. Ptas.)	3,205.69		Applied to the 1984 Regular Budget	100,000.00
Cash on hand (Ptas.)	11,298.62			
(at 161 Ptas. per $1)	6,420,702.84	39,880.13	Contributions pending payment:	
		786,785.70	Regular Budget	230,620.83
Receivables:			Skipjack Budget	12,610.70
From Regular Budget:				
BENIN	20,227.00			
BRAZIL	25,871.00		Expenses forecast to the end of	
CUBA	13,306.32		Program activities	53,331.56
GABON	16,764.41			
GHANA	51,522.27		Positive balance forecast to the	
IVORY COAST	19,610.05		end of Program activities	20,114.41
MOROCCO	38,068.00			
SENEGAL	45,251.78	230,620.83	Difference in currency exchange	366.53
From Skipjack Budget:				
BENIN	3,044.70			
GABON	860.00			
GHANA	4,800.00			
MOROCCO	3,906.00	12,610.70		
Equipment:				
Acquired before 1983	136,646.96			
Acquired during 1983	64,759.97	201,406.93		
Bonds		269.20		
TOTAL ASSETS		1,231,693.36	TOTAL LIABILITIES	1,231,693.36
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/83/22 (Amended)

I. Data collection and sampling

1. Collection of 1982 statistics through national offices

The same routine procedure was adopted as has been used in previous years. Various requests and reminders were forwarded by letter, telephone, telex and telegram to those countries which did not provide the Commission with statistics on time. The progress made by national offices and by the Secretariat is shown in Table 1 to Appendix 5 to Annex 10.

The reporting of Task I nominal annual catch statistics, Task II catch and effort statistics and Task II biological data in 1983 was again considerably behind schedule. Although some countries (e.g., Spain, Korea) reported Task I data much earlier than usual, as of the date of writing this report (September 30), we still do not have either Task I or Task II data for the following major fisheries: Japanese longline, FIS and Ghanaian fleets. They represent almost half of the total major tuna catches.

On the other hand, the biological sampling program started during the International Skipjack Year Program continued during this year in many countries.

The problem and special achievement areas in current statistics are listed here below by country.

Angola	Task I: Catches of minor species such as West African Spanish mackerel are not reported. These data are taken from FAO statistics for all past years. Size: Bigeye size data reported, but no Task I bigeye catch reported (1982).
FIS	No Task I catch, catch-and-effort or size data reported for 1982. We have noted that there have been major computer problems. Also, past catch and effort statistics (up to 1981) are supposed to be in process of revision. We have been promised these data by March, 1984. If catch and effort data are revised, size data have to be revised as well, since FIS size data are reported only after raised to total catch. Neither basic size data nor substitution procedures have been reported to ICCAT.
Canada	Catch and effort and size data have not yet been reported for 1982. The Secretariat has been notified of delay due to reorganization.

Brazil	No longline data (catch and effort, size) reported for 1982. Also, no data on baitboats from Itajai have been reported for 1981-1982. Baitboats from Rio de Janeiro are well covered for size and catch and effort since 1981.
Brazil-Japan	No data on catch, catch and effort or size for 1982.
Cuba	Improvements in size data for the baitboat fishery. The blackfin tuna catch is now reported separately from skipjack. No longline catch and effort data for 1982 or size data in the past years have been reported.
France	Bay of Biscay, albacore and bluefin: No catch and effort or size data for 1982.
Ghana	No Task I, catch and effort or size data for 1982.
Ghana-based	No Task I, catch and effort or size data for 1982.
Italy	No Adriatic Sea catch data for past years. No reporting of Age-0 fish catch for past years. Biological sampling program terminated this year (possible future problem).
Japan	No Task I, catch and effort or size data for 1982.
Libya	New historical data on bluefin catches.
Mexico	No statistics reported for 1982.
Uruguay	No national statistics reported for 1982. Improvements in reporting foreign vessel landings.
Norway	No bluefin purse seine catch and effort or size data for 1982.
Portugal	Mainland: No Task I, catch and effort or size data. Azores and Madeira: No size data except for bluefin.
Spain	Tropical: No yellowfin/bigeye separation for 1982. Canary Islands: No catch and effort or size data for 1982. Longline: No catch and effort or size data for 1982. Bay of Biscay: No catch and effort for bluefin for recent years.
U.S.A.	Tropical: No catch and effort data since only one boat operated (confidential nature). Bluefin: No catch and effort data. Billfishes: No Task I catch since 1981. All the historical tournament size data became available.

Venezuela	Major improvements in reporting baitboat and purse seine catches. Catch and effort data partially started and sampling started. Puerto Rico sampling covers transported catches. Minor species not yet reported. Purse seine size and catch and effort to be intensified.
Tunisia	New historical data on bluefin obtained.
Turkey	No data for 1982.
U.S.S.R.	Longline: No size data for 1982. Catch and effort reported by FAO area, to be broken down by 5°x5° area.
Yugoslavia	No data for 1982.

2. Port sampling by the Secretariat

In early 1983, the Assistant Executive Secretary visited problem areas and tried to reconstruct the port sampling system.

St. Maarten	The port sampler contracted at this port discontinued his sampling work in mid-1981. A new person was contracted and trained. Since March, 1983, he has been working and sampling all the landings. The program at St. Maarten seems to be running smoothly now.
Venezuela	Foreign flag vessels are no longer unloading at Venezuela. Therefore, the port sampling contract for foreign flag vessels was terminated. However, the Secretariat is trying to establish a port sampling system for the developing Venezuelan national fleets (baitboat and purse seine). This year, for the first time, we had some degree of success along these lines. The program can be reinforced in the future.
Montevideo	A transshipping agency which handles all the transshipments of the foreign flag fleet is refusing to cooperate. In 1983, size sampling at least was successfully initiated with the hiring of a new local sampler. Logbook abstracts are still difficult to obtain due to the above reason.

In addition to the ports mentioned above, port sampling for foreign landings is being continued at Las Palmas, Tenerife and Cape Town. The quality and quantity of sampling was at its lowest in 1982 since we started the program, but great improvements are expected for 1983.

3. Unconventional fleet statistics

For 1982 catch statistics, there are no major problems. When the Assistant Execu-

tive Secretary visited Venezuela, he obtained all national landing data for the past three years, and sufficient data to estimate the foreign port landings of Atlantic catches by Venezuelan seiners.

Through the efforts of the French, Spanish and Moroccan scientists, much better estimates of other unconventional tropical fleet catches have been obtained. However, we still receive Task II catch and effort and size data for these fleets on a very sporadic basis only.

II. Secretariat data processing

1. Facilities

The INFONET system was contracted again in 1983 for ICCAT data management. The unit cost in pesetas rose again but the recent favorable dollar exchange rate absorbed much of this increase.

2. Data processing

The following data processing has been done by the Secretariat in 1983:

a) Updating all data bases (Task I, catch and effort, size, tagging).

b) Data entry and processing of port sampling statistics.

c) Separation of Task I catch data into major areas (and sometimes into species) using Task II and biological data.

d) Output of the Statistical Bulletin Tables.

e) Output of Task II data received recently (Data Record, Vols. 21 and 22).

f) Preparation of species catch tables for the SCRS Meetings and consequently for the SCRS Report (both 1982 and 1983 Reports).

g) Analytical processing for biostatistical work.

h) Updating tagging file and output of yearly recovery summary.

i) Creation and distribution of tapes, upon request by the member countries.

j) Skipjack Program processing and output of bookkeeping information on sample collection and disposition.

k) Tag reward accounting and billing for Skipjack Program.

l) Processing of bluefin data for May Trapani meeting and the September Bluefin Workshop (see Section IV.1).

3. Dissemination of information and publications

a) Quick estimates:

April, 1983 — estimates for all of 1982
October, 1983 — estimates for first half of 1983

b) Statistical Bulletin

February, 1983 — 1981 final version - published (Vol. 12)
September, 1983 — 1982 provisional version - published (Vol. 13)

c) Data Record

Volume	Published	Data received in
21	March, 1983	October, 1982 - February, 1983
22	October, 1983	March - September, 1983

d) Collective Volume of Scientific Papers

Volume	Published	Contents
XVIII (1, 2, 3)	March, 1983	1982 SCRS Papers
XVIII (4)	March, 1983	1982 SCRS Report A

e) Statistical Series

Vol. 11 — Port sampling summary for 1981, 1982 - published September, 1983.

III. Special notes by the Secretariat on problems related to the data base

The ICCAT data base was established in 1975 and has been updated continuously since then. Updating has been done using two sources: annual submissions of Task I and II data from national scientists, and data which the Secretariat obtained from other sources, including the Secretariat port sampling.

The data base format has been designed in a very flexible way so that almost any type of data in various time-area resolutions can be entered.

The new data are tabulated and issued in the Data Record with cumulative data catalogues twice a year.

There have been various serious problems observed in this system:

1. Some ambiguity in the criteria for adequate data

This problem was pointed out at the recent Bluefin Workshop. Up to now the only criterion established by the SCRS has been that Task I catch, Task II catch and effort and Task II biological data are to be submitted. Time-area resolutions required for such data are clear. However, there has been no decision made by the SCRS on the criteria for accuracy, coverage and procedure. The Secretariat uses the "Field Manual for

Statistics and Sampling" (Second edition, 1978) as a guideline for maintaining the quality of information. Since the "Field Manual" was reviewed and approved by the SCRS before its publication, the guidelines outlined in the Manual can be considered as having been approved by the SCRS. On the other hand, if the SCRS wishes to establish different, clear-cut criteria for sampling (e.g., certain number of fish per 100 MT of catch, etc.), it can still do so.

2. Checking adequacy of sampling

At present, the Sub-Committee on Statistics is supposed to check the adequacy of statistics. Every year the Secretariat submits a table showing the availability of data for all fisheries. The table (Table 1 of Appendix 5 to Annex 10) also includes the number of fish which were measured for size, only if that information is available. It seems that the Sub-Committee does not have enough time to evaluate the adequacy of sampling, except to point out some major deficiencies. Since it would be a difficult task for the Secretariat to review the quality of all the data, perhaps some new mechanism can be sought, or the Sub-Committee on Statistics can be assigned the task of enforcing this policy.

3. Unclear procedures for compiling statistics

Many countries submit size frequencies already raised to the catch, but they do not report the data substitutions and raising procedures used. Therefore, the Secretariat has no knowledge of, for example, how many fish have been measured and how substitutions and raising were done. The failure of one of the important biostatistical assignments given to the Secretariat (i.e., overall review of sampling procedures) is precisely due to the lack of such information.

This problem seems more serious than ever as analytical studies have been advancing. Whether the data base used in the analyses can really support such a study is doubtful. Unless each national office becomes more conscientious about reporting this basic information, an evaluation of sampling adequacy can never be achieved.

4. Deficiencies in the ICCAT data base

While preparing the data base to be used by the Bluefin Workshop, the Secretariat made a critical review of the bluefin biological data base. It was found that the base has many problems: some entry errors, double entries of the same samples (e.g., in percent vs. actual size frequencies), various discrepancies among data sources (e.g., size data for supposedly nil catches), inconsistencies in size classes (mid-point, rounded-up, rounded-off are all mixed), vagueness in measuring methods, conversions, etc. Very similar problems were experienced when the Secretariat worked on the juvenile tropical tuna data.

Some deficiencies are partly Secretariat errors when inputting and checking the data, but the major errors and inconsistencies are in the original data which the Secretariat has received.

5. Discrepancies between national and Secretariat data bases

For various reasons, it seems that the data bases—which are supposedly common among various national institutes and the Secretariat—are indeed not the same. The following could be causes for such inconsistencies:

a) National offices frequently update their data bases but sometimes fail to inform the Secretariat of the changes.

b) Errors in inputting hard copies by various institutes.

c) Each scientist gives different interpretations of data.

d) Mechanical and human error in transferring files from a magnetic tape to their own data files.

IV. Special assignments given to the Secretariat

1. Updating and processing for the Bluefin Workshop

When the Secretariat foresaw a delay in preparing the bluefin data base by the national offices and the postponement of the Workshop from May to September, we proposed a "preparatory meeting" in May. (See Administrative Report for more details.)

The Secretariat critically reviewed all bluefin biological and Task I data availability in the data base, which were presented at the Preparatory Meeting held at Trapani, Italy. The group of experts which met there agreed to the data substitution scheme and on the procedure of classifying the catches by size-classes. With the assistance of the French, Japanese, Spanish, Portuguese and U.S. scientists, the Secretariat established a data base including catch-by-size tables for each bluefin fishery for 1960-1981. (See SCRS/83/15.) The base was then converted and adapted to the computer at Tsukuba for use by the Bluefin Workshop participants during the session. The base was modified both during and after the Workshop, and the final base was completed at the Secretariat. The assistance rendered by the Far Seas Fisheries Research Laboratory staff, and in particular by Mr. Honma before and during this session, should be mentioned.

2. Biostatistical work

The biostatistician, after participating in the Regional Meeting on Skipjack convened in Senegal in March, remained at the "Centre de Recherches Oceanographiques de Dakar-Thiaroye" to discuss the FIS-FISM data handling system, visit the fishing port, and discuss training for West African countries with the CECAF Secretariat. He also participated in the Skipjack Conference in Tenerife (Spain) in June-July, and presented a paper on the baitboat fisheries for skipjack in the Gulf of Guinea which will be included in the Proceedings of the Conference.

He coordinated for the Secretariat the statistics and sampling training courses given in Ivory Coast in April and in Tenerife (Spain) in June-July (SCRS/83/18).

He carried on extensive correspondence with the Nigerian Institute of Oceanography and Marine Research (NIOMR) and the private contractor hired by NIOMR to carry out exploratory baitboat fishing in the Gulf of Guinea during 1982-83 as to the use of data from the ICCAT data base in the survey and analysis of its results. He also consulted with the "Direction des Peches Industrielles" of Gabon on the use of data from the ICCAT data base, and with biologists from Madeira (Portugal) on sampling problems.

A specialized study was carried out on the ICCAT data base and factors associated with the levels and adequacy of past and present sampling (SCRS/83/24).

3. Bluefin hard parts sampling

Following the recommendation made by the SCRS, the Secretariat coordinated the eastern Atlantic bluefin hard part sampling program. The following made substantial contributions to the program:

ISTPM, Sète, France, collected small bluefin samples in early 1983 and sent them to the U.S.

IEO, Málaga, Spain, collected samples from 100 large bluefin from the Barbate trap in collaboration with the Secretariat. The samples were sent to the U.S.

PELAGOS, Messina, Italy, collaborated with the Secretariat in the collection of 100 large fish samples from purse seine and trap catches. The samples were sent to the U.S.

4. Training courses

Two official training courses in statistics and sampling were held this year, primarily one for east Atlantic countries and one for west Atlantic countries. (See SCRS/83/18 for more details.)

5. Fishing power statistics

Following the SCRS recommendation, the Secretariat requested all countries concerned to review and update their fleet statistics. As a result, major improvements were observed for the following fleets:

France, temperate (troll and baitboat) – New data series
Morocco – New data series
Spain – Revision
U.S.S.R. - New data series

Also, total fleet capacity statistics became available for many important fleets (see also SCRS/83/27).

V. Tagging Program

With the termination of the International Skipjack Year Program (ISYP), the international tagging program is now being coordinated by regular staff according to the tagging policy agreed upon at the 1982 SCRS Meeting. The tagging lottery was held in June, 1983, at Tenerife, at the time of the Skipjack Conference. A $500 prize was awarded to the winner in each of four categories: east Atlantic skipjack, west Atlantic skipjack, Atlantic tropical tunas (except skipjack) and Atlantic temperate tunas and tuna-like fishes. As the ISPY has ended, next year's lottery will award prizes in only two categories: tropical (yellowfin, skipjack and bigeye) and temperate (all others).

VI. International Skipjack Year Program (ISYP)

Though the ISYP terminated in 1982, the SCRS proposed a one-year (1983) extention of the Program to close and report all the activities. The Skipjack Conference, whose purpose was to report all the findings of the Program, was held in Tenerife (see COM/83/10 and SCRS/83/16) in June, 1983. The report to the Commission was also drafted at that time. The Skipjack Coordinator and the Secretariat staff worked in finalizing the Secretariat's work on the Program, in preparing the Conference, and in coordinating the results of the Conference.

The reports submitted at the Conference are being reviewed by three editors (P. Symons, G. T. Sakagawa and P. M. Miyake) and by selected scientific referees in the respective technical fields. These reports if accepted will be formally published in one volume together with the SCRS' answers to the four skipjack questions posed by the Commission.

The Skipjack Coordinator terminated his contract with the Commission on August 31, 1983. The Commission formulated a contract with Dobrocky Seatech, Dr. Symons' new employer, to complete the editing and typing of the entire report of the Skipjack Conference. The report is expected to be issued in mid-1984.

CHAPTER II
Record of Meetings

PROCEEDINGS OF THE EIGHTH REGULAR MEETING OF THE COMMISSION

Madrid, Spain, November 9 - 15, 1983

Table of Contents

Opening Plenary Session – November 9, 1983

Item 1. OPENING OF THE MEETING

1.1 The Commission held its Eighth Regular Meeting at the Hotel Princesa Plaza, Madrid, Spain, under the chairmanship of Dr. L. Koffi (Ivory Coast). The Chairman introduced Mr. M. Oliver, Secretary General of Fisheries of the Ministry of Agriculture, Spain.

1.2 Mr. Oliver extended a warm welcome to all the delegates and observers. A special welcome was extended to the Commission's newest members, Uruguay and Sao Tomé and Principe. He referred to the growing Spanish fleet and expressed Spain's keen

interest in the conservation of fishery resources. Since tuna fisheries are important to Spain, the work of the Commission in research and conservation is very much appreciated by the country. Its interest is shown by hosting the seat of the Commission. He expressed his wish to the participants for a successful meeting and a pleasant stay in Spain. (Mr. Oliver's address is attached as Annex 3).

1.3 After a short recess, the Chairman, Dr. Koffi, formally opened the meeting. He welcomed all the delegates and observers, particularly the new members of the Commission, Uruguay and Sao Tomé and Principe. He expressed his pleasure in returning to Madrid after two years of meeting outside the Spanish capital. He noted that the Eighth Regular Meeting is working within a new international context created by the new Law of the Sea Convention and suggested that the Commission seriously consider the repercussions that this new Law of the Sea may have on the ICCAT Convention.

1.4 Dr. Koffi expressed his pleasure in having served as Commission Chairman for four years and noted the remarkable progress made by the Standing Committee on Research and Statistics, as well as the extensive activites of the Secretariat. He thanked various Commission officers who assisted him in his duties as Chairman. He noted that ICCAT has entered a new era of maturity. The International Skipjack Year Program (ISYP) was successfully carried to a close and he expressed his appreciation to all those involved in the Program, as well as to the Spanish authorities who hosted the Skipjack Conference in Tenerife. The success of the ISYP is proof that ICCAT fulfills its mission well.

1.5 Dr. Koffi commented on the progress in bluefin research made at the two intersessional meetings and noted that the SCRS has concluded that the state of bluefin stocks is still unknown. He could also foresee some difficulties in evaluations of tropical tuna stocks. He recognized the efforts of scientists to solve these problems and was pleased to see the progress made in research by the various working groups.

1.6 He believed that the Commission will continue to work effectively in the future. He especially commended the efforts and excellent chairmanship demonstrated by the SCRS Chairman, Mr. J. S. Beckett (Canada). (Dr. Koffi's opening address is attached as Annex 4).

1.7 The delegate of Uruguay thanked the Chairman for his welcome. He noted that his country still has a modest tuna fishing fleet but that it is very interested in the Commision's work and added that he is pleased to work with the other members of the Commission.

1.8 The delegate from Sao Tomé and Principe thanked the Chairman for his welcome and expressed his wish for a very successful meeting.

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

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

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

2.3 It was decided that Agenda Items 4-7, 9-14, 24, and 26-28 would be referred to the Standing Committee on Finance and Administration (STACFAD). Item 22 is referred to the Infractions Committee.

Item 3. ADMISSION OF OBSERVERS

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

Item 15. REPORT OF THE THIRD SPECIAL MEETING OF THE COMMISSION

15.1 The Executive Secretary reported briefly on the Third Special Meeting of the Commission held in Funchal, Madeira, in November, 1982. The report of this meeting is included in the "Report for the Biennial Period, 1982-83 (Part I)" which is available to the Commission.

Second Plenary Session – November 10, 1983

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

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

16.2 Mr. Beckett presented the results of scientific research on stock structure, status of stocks, and the effects of current regulations (where applicable) for each major species.

16.3 The SCRS Chairman requested that the Commission take special note of the recommendations made by the SCRS regarding statistics, research, and management, which appear throughout the text and in the appendices of the Report.

16.4 He also commented on the successful termination of the International Skipjack Year Program (see Item 18).

16.5 The extensive program of the Working Group on Juvenile Tropical Tunas to complete the tasks assigned to the Group was also presented. The importance of completing the work was emphasized, particularly as regards the problem of taking undersized yellowfin and bigeye tunas.

16.6 The SCRS also recommended that if a micro-computer system with word processing functions is purchased for the Secretariat, that the system be upgraded to handle analytical studies on the summarized data base during scientific sessions.

16.7 Mr. Beckett reported that SCRS meeting organization was discussed by the Committee. For the 1984 session, the SCRS recommended holding a meeting of the Bluefin Working Group approximately a week before the SCRS session. Also, one day of the SCRS session is scheduled for discussion of statistical collection procedures.

16.8 The Commission congratulated the SCRS Chairman and the scientists for successfully carrying out scientific studies and for the remarkable progress made. The Commission adopted the SCRS Report (Annex 10), while reserving the right to examine further the SCRS findings during the Panel and STACFAD meetings.

Item 17. REPORT OF THE SKIPJACK CONFERENCE (TENERIFE, JUNE, 1983)

17.1 Dr. G. T. Sakagawa (U.S.A.), Convener of the Sub-Committee on Skipjack, reported the results of the Skipjack Conference, held in Tenerife, Canary Islands, Spain. The Conference was held upon termination of the International Skipjack Year Program (ISYP) to report the scientific results of the ISYP and to seek answers to the four questions posed by the Commission at the beginning of the Program.

17.2 The conclusions reached at the Conference are summarized in Appendix 3 of the SCRS Report. Summaries of the individual papers submitted at the Conference were made available to the Commission participants. Publication of these papers is expected in mid-1984.

17.3 While reviewing the Conference Report, some discussion ensued on the species interaction between skipjack and other tropical tunas. Although there is still a considerable margin for exploitation of skipjack tuna, an increase in skipjack catches may increase catches of small yellowfin and bigeye tunas which the Commission has been trying to protect.

17.4 The Commission noted that data collected during the ISYP have been entered into the ICCAT data base and will be available for study by the Working Group on Juvenile Tropical Tunas. This Group is now concentrating its studies on species interactions in the eastern tropical Atlantic surface fisheries.

17.5 The Commission was pleased with the successful completion of the ISYP and congratulated all the scientists who contributed to the Program, the Convener of the Sub-Committee on Skipjack, the Skipjack Coordinator and the Secretariat.

Third Plenary Session – November 12, 1983

Item 8. EEC'S REQUEST FOR ADMISSION TO ICCAT

8.1 The Commission Chairman, Dr. Koffi, reviewed briefly the background of the Commission's discussions on this matter. The delegate from France reviewed the latest French proposed amendment to Article XIV (attached as Annex 5), which had been circulated in advance of the Commission Meeting. He emphasized the length of time it takes the Commission to make a decision, the various changes in the procedure to be

followed, and the importance of this issue for his country considering its commitments to the EEC.

8.2 The delegate from Spain reiterated his country's doubt expressed in previous meetings as to whether the procedure set out in Article XIII of the Convention was the correct one to follow. In his view, the procedure outlined in the aforementioned Article could have future legal implications as the amendment might be accepted by some Contracting Parties, but not by other Contracting Parties, in which case the latter would not be under obligation. He also noted that the French proposal could not be supported by Spain due to the problem of Gibraltar. The EEC observer pointed out that in his view the special status of such a territory does not concern an international convention specialized in fisheries, such as ICCAT.

8.3 Japan proposed a minor change to paragraph 1 of the French proposal, which was accepted (Annex 5).

8.4 The delegate from Japan also requested clarification as to the status of those EEC member states which are not ICCAT members at the time of admission of the EEC as well as the status of those ICCAT member countries who are not currently members of the EEC but who may become members in the future. In order to clarify this point, a slight modification was introduced to paragraph 3 of the French proposal.

8.5 The delegate from the U.S.S.R. presented his country's amendments to the French proposal (Annex 6). He further stated that unless the Soviet Union's amendments are incorporated in the French proposal and approved by the necessary majority, his country could not accept the French proposal.

8.6 As a point of information, the representative from the FAO, on behalf of the Director General in FAO's capacity as the depository of the ICCAT Convention, requested that it be made perfectly clear which present Commission members will or will not cease to be members inasmuch as the duties and obligations to be taken over by the EEC or other intergovernmental organizations are concerned. The representative from FAO also noted that it was suggested by the FAO Legal Office that consistency be maintained with other parts of the Convention. In this respect, he suggested a change in drafting to paragraph 3 of the French proposal (Annex 5).

8.7 The Commission Chairman formed a working group to review the French proposal in more depth. Canada was asked to chair the group.

8.8 After the working group recessed, the Plenary was reconvened. The Chairperson, Ms. E. Feldman, summarized the conclusions of the deliberations of the working group. The group recognized that the differences between the French proposal (as revised) and the Soviet amendments to this proposal were a matter of substance and not one of drafting. As for the procedure to be followed, recognizing the legal implications involved in applying the procedure outlined in Article XIII of the Convention, Spain proposed in the working group that a Conference of Plenipotentiaries be convened to draft a Protocol to deal with the issue of the admission of the EEC or similar intergovernmental organizations.

8.9 The Chairperson reported to the Commission that there was a consensus within the working group that the Protocol procedure be recommended to the Commission for approval.

8.10 The Commission expressed its agreement with the recommendation made by the working group to convene a Conference of Plenipotentiaries to deal with the issue of the admission of the EEC or similar intergovernmental organizations through the addition of an agreement to the present Convention in the form of a Protocol, which would go into effect upon agreement by the plenipotentiary parties. The delegate from France expressed his country's desire that such a Conference be called as soon as possible, and before the next Commission Meeting, if it can be so arranged. While agreeing to this, the Canadian delegate noted that he would have to consult with his government's authorities as to the proper scope for an Agenda for such a Conference.

Fourth Plenary Session – November 14, 1983

Item 23. OTHER POSSIBLE REGULATORY MEASURES TO BE CONSIDERED

23.1 The SCRS Chairman reported that the SCRS had no additional regulations to recommend, except for those presented by the Panels.

Item 25. OTHER ACTIVITIES IN RESEARCH AND STATISTICS

25.1 The SCRS Chairman referred to the recommendations presented and reviewed at the various Panel and Committee meetings. He noted that many recommendations were made this year and that special attention was being given to these recommendations by the member countries and by the SCRS in order to have clearer answers available at the next SCRS meeting.

Final Plenary Session – November 15, 1983

Item 19. REPORTS OF PANELS 1-4

19.1 The Reports of Panels 1 through 4 were presented by the respective Panel Chairmen. All the reports were adopted by the Commission together with all the recommendations contained therein (Annex 7).

19.2 The Commission noted that new recommendations for regulatory measures on the bluefin tuna catch were made by Panel 2 (Appendix 4 to Annex 7). The Commission adopted these recommendations.

Item 20. REPORT OF THE INFRACTIONS COMMITTEE

20.1 The Chairman of the Infractions Committee reported the results of the Committee's discussions. The report was adopted (Annex 8) and the Commission approved all the recommendations contained therein. The Commission noted that Agenda Item 22,

"Status of the regulations adopted by the Commission regarding yellowfin, bluefin and bigeye", was carefully studied by the Committee.

Item 21. REPORTS OF SUBSIDIARY BODIES APPOINTED BY THE COMMISSION FOR THE MEETING

21.1 No subsidiary bodies were appointed.

Item 18. REPORT OF THE STANDING COMMITTEE ON FINANCE AND ADMINISTRATION (STACFAD)

18.1 The Chairman of the Standing Committee on Finance and Administration (STACFAD) presented the Report of his Committee. The Commission reviewed and adopted the Report and all the recommendations contained therein. The Report is attached as Annex 9. The following Agenda items were covered by the Committee:

Item 4. Panel membership

Item 5. Administrative Report

Item 6. Relations with other organizations

Item 7. Commission publications

Item 9. Auditor's Report 1982

Item 10. Financial status of Regular Budget 1983

Item 11. Working Capital Fund - Regular Budget

Item 12. Regular Budget for Biennial Period 1984 - 1985

Item 13. Member country contributions to the Regular Budget 1984 - 1985

Item 14. Financial status of the Skipjack Budget

Item 24. Training program for developing countries

Item 26. Date and place of the next meeting of the Council or Special Meeting of the Commission

Item 27. Items to be considered by the Council at its next meeting

Item 28. Date and place of the next Regular Meeting of the Commission

Item 29. OTHER ITEMS

29.1 Ivory Coast requested that the Agenda for the Meeting of Plenipotentiaries be distributed well in advance so that national offices can study it in depth. He also noted that the Agenda should not be limited to the problem of the adherence of the EEC but should include such items as the possible dissolution of the Council, inclusion of Portuguese as an official language of the Commission, etc.

Item 30. ELECTION OF THE CHAIRMAN OF THE COMMISSION

30.1 Ivory Coast proposed that Mr. C. J. Blondin (U.S.A.) be elected next Chairman of the Commission. Most of the member countries indicated their support of the proposal and Mr. Blondin was elected Chairman for the coming biennial period.

30.2 In accepting the Chairmanship, Mr. Blondin complimented Dr. Koffi for the efficient and congenial manner in which he chaired the Commission and pledged that he would carry out his duties to the best of his ability.

Item 31. ELECTION OF THE VICE-CHAIRMEN OF THE COMMISSION

31.1 France nominated Mr. S. Makiadi (Angola) for the office of First Vice-Chairman of the Commission; this nomination was unanimously supported.

31.2 Spain nominated Mr. J. Boavida (Portugal) for the office of Second Vice-Chairman of the Commission and the nomination was unanimously supported.

31.3 Mr. Makiadi accepted the responsibility as First Vice-Chairman and requested the cooperation of the members. Mr. Boavida also accepted his responsibility as Second Vice-Chairman and thanked the Commission for its support.

Item 32. ELECTION OF COUNCIL MEMBERS

32.1 Since a Special Meeting of the Commission will be held in 1984, the Commission decided that it would not be necessary to elect members of the Council for the next biennial period.

Item 33. ADOPTION OF REPORT

33.1 The Commission adopted the Proceedings of the Opening, Second, Third and Fourth Plenary Sessions, together with all the annexes and appendices.

33.2 The Commission decided to approve the Proceedings of the Final Plenary Session by mail as soon as possible after the meeting.

Item 34. ADJOURNMENT

34.1 Dr. Koffi, Chairman of the Commission, reiterated that it was a pleasure working with the Commission as its Chairman. He thanked the member countries for their cooperation and friendship. He also commended the excellent quality of work carried out by the SCRS, chaired by Mr. Beckett, and the STACFAD, chaired by Mr. Blondin. He thanked the Executive Secretary and his staff and the interpreters for their efficient work during the meeting. He also congratulated the newly-elected Chairmen.

34.2 The Meeting was adjourned.

Annex 1

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. Panel membership
5. Administrative Report
6. Relations with other organizations
7. Commission publications
8. EEC's request for admission to ICCAT

Finance

a) Regular Commission Budget

9. Auditor's Report 1982
10. Financial status of Regular Budget 1983
11. Working Capital Fund - Regular Budget
12. Regular Budget for Biennial Period 1984 - 1985
13. Member country contributions to the Regular Budget 1984 - 1985

b) Special Skipjack Budget

14. Financial status of the Skipjack Budget

Reports to the Commission

15. Report of the Third Special Meeting of the Commission
16. Report of the Standing Committee on Research and Statistics (SCRS)
17. Report of the Skipjack Conference (Tenerife, June 1983)
18. Report of the Standing Committee on Finance and Administration (STACFAD)
19. Reports of Panels 1 - 4
20. Report of the Infractions Committee
21. Reports of subsidiary bodies appointed by the Commission for the meeting

Measures for the conservation of stocks

22. Status of the regulations adopted by the Commission regarding yellowfin, bluefin and bigeye
23. Other possible regulatory measures to be considered

Research

24. Training program for developing countries
25. Other activities in research and statistics

Other matters

26. Date and place of the next meeting of the Council or Special Meeting of the Commission
27. Items to be considered by the Council at its next meeting
28. Date and place of the next Regular Meeting of the Commission
29. Other items
30. Election of the Chairman of the Commission
31. Election of the Vice-Chairmen of the Commission
32. Election of Council Members
33. Adoption of Report

Adjournment

34. Adjournment

Annex 2

LIST OF PARTICIPANTS

Member Countries

ANGOLA

MAKIADI, S.**
Director do Gabiente de
Intercambio Internacional
Ministerio das Pescas
C. P. 83
Luanda
(Head Commissioner)

JARDIM, F.**
Centro de Investigaçao Pesqueira
C. P. 83
Luanda

SEBASTIAO, P. **
Director do Gabinete Jurídico
Ministerio das Pescas
C. P. 83
Luanda

BRAZIL

MELANTONIO NETO, D. C. **
Jefe de la Oficina Comercial
Embajada del Brasil
C/Jacometrezo, 4
Madrid -13 (Spain)

CANADA

PARSONS, L. S.**
Assistant Deputy Minister
Atlantic Fisheries
Dept. of Fisheries & Oceans
240 Sparks St.
Ottawa, Ontario K1A 0E6
(Head Commissioner)

CORMIER, A. O.**
Dept. of Fisheries & Oceans
Fisheries Research Branch
P. O. Box 5030
Moncton, New Brunswick E1C 9B6
(Commissioner)

KING, T.**
RR1 Judique Inv. Co.
Nova Scotia, B0E 1P0
(Commissioner)

BECKETT, J.S.
Fisheries Research Directorate
Resource Research Branch
Dept of Fisheries & Oceans
240 Sparks St.
Ottawa, Ontario K1A 0E6

FELDMAN, E.**
Environmental & Fisheries Law Section
Legal Operations Division
Dept of External Affairs
125 Sussex Drive
Ottawa, Ontario K1A 0E6

*Attended the SCRS but not the Commission Meeting.
**Attended the Commission Meeting but not the SCRS.

HURLBUT, T. R.*
Dept. of Fisheries & Oceans
Fisheries Research Branch
P. O. Box 5030
Moncton, New Brunswick E1C 9B6

JOURNEAUX, H.**
Journeaux Sea Foods, Ltd.
Port Daniel, Quebec

MAGUIRE, J. J.
Dept. of Fisheries & Oceans
Fisheries Research Branch
P. O. Box 15500
Quebec, G1K 7Y7

STEINBOCK, R.**
Pacific Rim Division
International Directorate
Dept. of Fisheries & Oceans
240 Sparks St.
Ottawa, Ontario K1A 0E6

CAPE VERDE

FARIA, A.**
Director Geral da Pesca Industrial
Interbase
C. P. 59
Mindelo
(Head Commissioner)

SANTA RITA VIEIRA, H.*
Direccao Geral das Pescas
C. P. 30
Praia

CUBA

CARTAS IGLESIAS, L.
Director Base Semidan FAC. G.C.
Artemi Semidan, 11 3-B
Las Palmas de Gran Canaria (Spain)
(Head Commissioner)

DELGADO VALDES, A. M.**
Asesor Legal
Ministerio de la Industria Pesquera
Oficios 452
La Habana

GARCIA MORENO, B.
Depto. Recursos Pesqueros
Dirección de Relaciones Internacionales
Ministerio de la Industria Pesquera
Ensenada de Potes y Atares
Luyano, La Habana

RODRIGUEZ RODRIGUEZ, A.
Biólogo Pesquero
Flota Atunera de Cuba
Oficios 110
La Habana

FRANCE

LABROUSSE, B.**
Sous-Directeur des Relations
Internacionales
Direction des Pêches Maritimes
et des Cultures Marines
3, Place de Fontenoy
75007 - Paris
(Head Commissioner)

DOBELLE, F.**
Ministère des Relations Exterieures
37, Quai D'Orsay
75007 - Paris

FONTENEAU, A. (Dr.)
Centre de Recherches Océanographiques
B. P. 2241
Dakar (Senegal)

ARANAZ, R.**
Syndicat des Marins Pêcheurs
Quai P. Ellisalt
74500 - Ciboure
St. Jean de Luz

CUEFF, J. C.**
Comité Central des Pêches Maritimes
11, Rue Anatole de la Forge
75017 - Paris

DION, M.**
Secrétaire Général
S.N.A.T.C.
B. P. 127
29181 - Concarneau Cédex

FARRUGIO, H.
ISTPM
1, Rue Jean Vilar
34200 - Séte

L'HELGOUALC'H, Y.**
Président, Comité Central des
Pêches Maritimes
11, Rue Anatole de la Forge
75017 - Paris

LIORZOU, B.
ISTPM
1, Rue Jean Vilar
34200 - Séte

OLASCUAGA, G.**
Cooperative Maritime Hegakoa
Rue Jean Poulou
74500 - Ciboure

PARRES, A. (Dr.)**
Délegué Général
Union Aramateurs à la Pêche de France
59, Rue des Mathurins
75008 - Paris

SOISSON, P.*
Union Armateurs à la Pêche de France
59, Rue des Mathurins
75008 - Paris

GABON

NDONG, M.**
Directeur des Pêches Industrielles
et Cultures Marines
B. P. 1128
Libreville
(Head Commissioner)

ONDO-EYI, J.**
Direction des Pêches Industrielles
Ministère des Eaux et Fôrets
B. P. 1128
Libreville

MBOUTOU, M. M.**
Ministère des Affaires Etrangères
Libreville

GHANA

KWEI, E. A. (Dr.)
Starkist International
P. O. Box 40
Tema

IVORY COAST

KOFFI, L. (Dr.)**
Directeur des Pêches Maritimes
et Lagunaires
Ministère Production Animale
B. P. V-19
Abidjan
(Head Commissioner)

AMON KOTHIAS, J. B. (Dr.)
Centre de Recherches Océanographiques
B. P. V-18
Abidjan

BARD, F. X. (Dr.)
Centre de Recherches Océanographiques
B. P. V-18
Abidjan

JAPAN

Shima, K.
Counsellor
Oceanic Fisheries Dept.
Fisheries Agency of Japan
1-2-1 Kasumigaseki, Chiyoda-ku
Tokyo
(Head Commissioner)

AKIYAMA, S.
Director
Fishery Division
Ministry of Foreign Affairs
2-2-1 Kasumigaseki, Chiyoda-ku
Tokyo

SHIMURA, S.
Executive Director
Federation of Japan Tuna Fisheries
Co-Operative Associations
22-3-2 Kudankita, Chiyoda-ku
Tokyo

HARADA, Y.
Chief, International Division
Federation of Japan Tuna Fisheries
Co-Operative Associations
22-3-2 Kudankita, Chiyoda-ku
Tokyo

Hayasi, S. (Dr.)
Far Seas Fisheries Research Lab.
Fisheries Agency of Japan
5-7-1 Orido
Shimizu 424, Shizuoka pref.

KUME, S.
Far Seas Fisheries Research Lab.
Fisheries Agency of Japan
5-7-1 Orido
Shimizu 424, Shizuoka pref.

NAGAI, T.*
Far Seas Fisheries Research Lab.
Fisheries Agency of Japan
5-7-1 Orido
Shimizu 424, Shizuoka pref.

NAKAMAE, A.
Far Seas Fishery Division
Fisheries Agency of Japan
2-2-1 Kasumigaseki, Chiyoda-ku
Tokyo

CAMPEN, S. J.
Consultant, Federation of
Japan Tuna Fisheries
7512 Ambergate Place
McLean, Virginia 22102
(U.S.A.)

KOREA

CHO, K. I.
Counsellor
Embassy of Korea
Miguel Angel, 23
Madrid -10 (Spain)
(Head Commissioner)

BAE, B. S.**
Assistant Director
Resources Cooperation Div.
Ministry of Foreign Affairs
Seoul

PARK, J. Y.*
Consul, Consulate General of
the Republic of Korea
Luis Doreste Silva, 60
Las Palmas de Gran Canaria
(Spain)

LEE, J. U.*
National Fisheries Research &
Development Agency
16, 2-Ga, Namhang-Dong, Yeongdo-gu
Busan 606

MOROCCO

BENJELLOUN, M.**
Directeur Financier à l'Office
National des Pêches
13215, Rue Chevalier Bayard
Casablanca
(Head Commissioner)

PORTUGAL

BOAVIDA, J. G.**
Deputy Director
International Fisheries Relations
Secretary of State for Fisheries
Ministry of the Sea
Av. da Republica, 32, 3-D
1100 - Lisbon
(Head Commissioner)

MONTEIRO, E. (Dr.)**
Assistant Director
Direction General for Fisheries
Secretary of State for Fisheries
Ministry of the Sea
Av. 24 Julho, 80
1200 - Lisbon
(Commissioner)

BORGES, J.**
Regional Director for Fisheries
Regional Government of Madeira
C. P. 747
9009 - Funchal, Madeira
(Commissioner)

QUARESMA, O.**
Consultant of the Regional
Government of Azores
Rua Dos Mercadores, 19
9500 - Ponta Delgada
St. Miguel - Azores
(Advisor)

DE GOUVEIA, L.*
Laboratorio de Investigacao
das Pescas
Rua da Mouraria, 31
9000 - Funchal, Madeira

ORNELAS, J. A. T.*
C. P. 747
9009 - Codex
Funchal, Madeira

PEREIRA, J.*
Universidade Dos Azores
Departamento de Oceanografía
e Pescas
9900 - Horta, Azores

SAO TOME AND PRINCIPE

DO ESPIRITO SANTO, G. C.
Técnico do Sector de Biología
Ministerio das Pescas
Sao Tomé

SOUTH AFRICA

WALTERS, B. G.**
Counsellor
South African Embassy
Claudio Coello, 91
Madrid -6 (Spain)

SENEGAL

CAYRE, P.*
Centre de Recherches Océanographiques
B. P. 2241
Dakar

SPAIN

CASANOVA, L. J.**
Director General de Relaciones
Pesqueras Internacionales
Secretaría General de Pesca
Ruiz de Alarcón, 1
Madrid -14
(Head Commissioner)

CHAO TOURIÑO, J. J.**
Subdirector General de Relaciones
Pesqueras Internacionales
Secretaría General de Pesca
Ruiz de Alarcón, 1
Madrid -14

MESEGUER, J. L.**
Jefe de Servicio de Derecho
Internacional Pesquero
Secretaría General de Pesca
Ruiz de Alarcón, 1
Madrid -14

LESMES, J.**
Subdirector General de Coordinación
Secretaría General Técnica
Ministerio de Economía e Hacienda
Alcalá, 5 y 11
Madrid -14

CENDRERO, O.
Director
Instituto Español de Oceanografía
Alcalá, 27
Madrid -14

ALOT, D. E.*
Instituto Español de Oceanografía
Paseo de la Farola, 27
Málaga

ANGULO, J. A.**
ANABAC
Txibitxiaga, 24
Bermeo, Vizcaya

BENITEZ ALVAREZ, M. E.**
PESCAFRISA - GESTION
Arturo Soria, 93
Madrid -27

BERMEJO, V.**
Secretaría General de Pesca
Ruiz de Alarcón, 1
Madrid -14

CORT, J. L.*
Instituto Español de Oceanografía
Apartado 240
Santander

DICENTA, A.*
Instituto Español de Oceanografía
Alcalá, 27
Madrid -14

ECHEVARRIA, J. I.
Consejero - Delegado
PEVASA
Txibitxiaga, 12
Bermeo, Vizcaya

GARCIA MOLINA, R.
Dirección General de Relaciones
Pesqueras Internacionales
Secretaría General de Pesca
Ruiz de Alarcón, 1
Madrid -14

GONZALEZ-GARCES. A.
Instituto Español de Oceanografía
Apartado 130
La Coruña

GARCIA MAMOLAR, J. M.
Instituto Español de Oceanografía
Apartado 240
Santander

FERNANDEZ-GONZALEZ, A. M.
Instituto Español de Oceanografía
Apartado 240
Santander

MEJUTO, J.*
Instituto Español de Oceanografía
Apartado 130
La Coruña

PALLARES, P.*
Instituto Español de Oceanografía
Alcalá, 27
Madrid -14

RAMOS, A.*
Instituto Español de Oceanografía
Paseo de la Farola, 27
Málaga

REY, J. C.*
Instituto Español de Oceanografía
Paseo de la Farola, 27
Málaga

SANTOS, A.*
Instituto Español de Oceanografía
Apartado 1373
Santa Cruz de Tenerife

TRIGO PORTELA, A.**
Jefe Servicio Información
Secretaría General Técnica
Ministerio de Economía e Hacienda
Alcalá, 5 y 11
Madrid -14

UNITED STATES

BLONDIN, C. J.**
Deputy Assistant Administrator (F/M)
NOAA-NMFS
Washington, D. C. 20235
(Head Commissioner)

CARLTON, F. E. (Dr.)
National Coalition for
Marine Conservation
P. O. Box 23298
Savannah, Georgia 31403

MCGOWAN, J. S.**
Consultant
P. O. Box 86
Astoria, Oregon 97103

BARTOO, N. (Dr.)*
Southwest Fisheries Center
NMFS
P. O. Box 271
La Jolla, California 92038

BRANCH, A. F.**
South Atlantic Fishery
Management Council
Council Member
1 South Park Circle
Charleston, South Carolina

BROADHEAD, G. C.
Living Marine Resources, Inc.
7169 Construction Court
San Diego, California 92121

CONSER, R.*
Southeast Fisheries Center
NMFS
75 Virginia Beach Drive
Miami, Florida 33149

CRESTIN, D.**
Chief, International & Oceanic
Fisheries Branch
National Marine Fisheries Service
State Fish Pier 4
Gloucester, Massachusetts 01938

FINK, B.**
Van Camp Sea Food Co.
11555 Sorrento Valley Road
San Diego, California 92101

HALLMAN, B. S.**
OES/OFA
Room 5806
Department of State
Washington, D. C. 20520

KEITH ROTHSCHILD, B.**
Office of International
Fisheries (F,M3)
National Marine Fisheries Service
Washington, D. C. 20235

KERNS, Jr., O.E.
Executive Director
U. S. Tuna Foundation
2040 Harbor Island Dr., Suite 208
San Diego, California 92101

KLEIBER, P. (Dr.)*
Southwest Fisheries Center
NMFS
P. O. Box 271
La Jolla, California 92038

MACKENZIE, W.
U. S. House of Representatives
Washington, D. C. 20515

MUÑOZ, Jr., J. E.**
Executive Vice-President
American Tunaboat Association
One Tuna Lane
San Diego, California 92101

PARRACK, M. L.
Southeast Fisheries Center
NMFS
75 Virginia Beach Dr.
Miami, Florida 33149

PUTNAM, B. J.**
G.M.F.M.C.
2206 Thomas Drive
Panama City, Florida 32407

RITTERHOFF, R.
U.S. Embassy
Serrano, 75
Madrid -6 (Spain)

SAKAGAWA, G. T. (Dr.)
Southwest Fisheries Center
NMFS
P. O. Box 271
La Jolla, California 92038

STOKES, J. E.**
Stokes Enterprises
Fourth Street, Plum Island
Newbury, Massachusetts 01950

STONE, R. B.**
Office of Fisheries Management
NMFS
Washington, D. C. 20235

URUGUAY

MAZZELLA ELENA, D. A.*
División Pesca Experimental
I.N.A.P.E.
Constituyente 1497
Montevideo
(Head Commissioner)

U. S. S. R.

VIALOV, Yu. A.
Atlantniro
Dmitrij Donskogo, 5
Kaliningrad
(Head Commissioner)

MIGETCHOV, Y.
Ministry of Fisheries
Rozhdestvensky Blvd., 12
Moscow, K-45

SHAROV, A. V.
Ministry of Foreign Affairs
Treaty and Law Department
Smolenskay, 3
Moscow

ARKHANGELSKI, R.
Embassy of the U.S.S.R.
Maestro Ripoll, 14
Madrid -6 (Spain)

FAO

GULLAND, J. A. (Dr.)
Chief, Marine Resources Service
FAO Fisheries Dept.
Via delle Terme di Caracalla
00100 - Rome (Italy)

ANSA-EMMIN, M.
Secretary, FAO-CECAF
B. P. 154
Dakar (Senegal)

Observers

ARGENTINA

NOVILLO SARAVIA, G.**
Secretario Comercial
Conserjería Económica
Embajada de Argentina
Paseo de la Castellana, 53
Madrid (Spain)

COLOMBIA

CARRANZA, R.**
Consejero
Embajada de Colombia
Martínez Campos, 48
Madrid (Spain)

COSTA RICA

OBREGON VALVERDE, E.
Embajador de Costa Rica
Embajada de Costa Rica
Espronceda, 34
Madrid -3 (Spain)

ECUADOR

DAVILA, J.*
Embajada de Ecuador
Príncipe de Vergara, 73 - 7º
Madrid -6 (Spain)

ITALY

PICCINETTI, C. (Dr.)*
Laboratorio di Biologia Marina e
di Pesca dell'Universitá di
Bologna in Fano
Viale Adriatico, 52
61032 - Fano

MEXICO

BUENO RODRIGUEZ, H.**
Subdirector, Asuntos Bilaterales
Secretaría de Pesca
Alvaro Obregon, 269 - 7º
Mexico, D. F.

TREVIÑO HUERTA, L.**
Tercer Secretario
Embajada de Mexico
Paseo de la Castellana, 93 - 7º
Madrid -6 (Spain)

NETHERLANDS

GEURTEN, F. J.**
Agricultural Advisor
Embassy of the Netherlands
Paseo de la Castellana, 178
Madrid -16 (Spain)

ROELE, C. D.*
Embassy of the Netherlands
Paseo de la Castellana, 178
Madrid -16 (Spain)

POLAND

DRAGANIK, B.
Director, Sea Fisheries Institute
Al. Zjednoczenia, 1
81-345 Gdynia

EEC

MCDERMOTT, G.**
EEC
200, Rue de la Loi
B-1049 Brussels (Belgium)

WEISS, G.**
EEC
200, Rue de la Loi
B-1049 Brussels (Belgium)

EUROSTAT

CROSS, D.*
EUROSTAT
B. P. 1907
Luxembourg

ICES

CENDRERO, O.

ICSEAF

LAGARDE, R.**
Executive Secretary
ICSEAF
Paseo de la Habana, 65
Madrid -16 (Spain)

IWC

SAKAGAWA, G. T. (Dr.)

CHINA (TAIWAN)

YANG, R. T. (Dr.)
Director
Institute of Oceanography
National Taiwan University
Taipei

ICCAT SECRETARIAT

O. Rodríguez-Martín
P. M. Miyake
J. P. Wise
V. Nordstrom
M. E. Carel
D. Da Rodda
M. A. F. de Bobadilla
C. García Piña
G. Messeri
J. A. Moreno
O. R. Muñoz
P. M. Seidita
G. Stephens
G. Turpeau

******

T. Infiesta
V. Labaye
D. Magermans
A. Mateos
S. Martin
F. Martínez

Annex 3

OPENING ADDRESS BY MR. M. OLIVER, SECRETARY GENERAL OF FISHERIES, SPAIN

Mr. Chairman, Delegates, Ladies and Gentlemen:

It gives me great pleasure and it is a great honor to welcome on behalf of the Government of Spain all the delegations of the ICCAT member countries, especially Uruguay and Sao Tomé and Principe, the newest member countries of the Commission, delegations from non-member countries, and the representatives of international organizations attending the meeting as observers, especially the representative of FAO which enjoys special status in this Commission.

In the fishery for highly migratory species, as well as other fisheries in which the Spanish distant-water fleet operates, the Spanish foreign policy for fisheries has been characterized by the linking of access to fishery resources in waters of other countries with economic, technical and scientific cooperation favoring fishery development of coastal developing countries. The present Spanish Government hopes to augment this practice and to establish through appropriate international means suitable ways of technology transfer, not only in relation to fishing activity, but also as concerns transport, distribution and canning of fish and fish products, the techniques of cold storage, marine fisheries professional training, etc.

In the specific area of highly migratory species, Spain has had considerable experience and high technological development in special fishing methods. It ranges from the most ancient fishing technique with traps–if they did not invent it, the system was at least perfected by the Romans who settled in Spain--to the most sophisticated and advanced technology of fishing by large freezer purse seiners equipped with modern navigational and detection instruments, to artisanal fishing with pole and line suitable for the development of fisheries located close to the coast.

I must mention that the Spanish fleet which normally operates in the Bay of Biscay also carries out its activities in other areas of the Atlantic, and on occasion has even reached the coasts of Senegal. Some vessels of this fleet have even carried out research cruises in waters off the Seychelles Islands.

Just as in the cases of the fleets of other countries which did not traditionally fish for highly migratory fish, the Spanish fleets have increased--although it seems paradoxical--while observing the conservation measures adopted by the International Commission for the Conservation of Atlantic Tunas. As you are all aware, since the Convention which created this Commission was signed in Rio de Janeiro seventeen years ago, the Commission has carried out the important and responsible task of conserving the species through the adoption of management measures aimed at maintaining catches at a sustainable level by means of a rational exploitation of the highly migratory species. We can recall measures which prohibit the catches of specific species under a minimum weight, the drastic reduction in effort on bluefin tuna in the western Atlantic, the adoption of

a port inspection scheme to assure the observance of these management measures, the carrying out of the International Skipjack Year Program, etc.

All of these accomplishments have had specific driving forces--the Standing Committee on Research and Statistics, the true heart of the scientific activities of the Commission, and the Standing Committee on Finance and Administration, which through its adoption of appropriate budgets makes it possible for the Commission to carry out the objectives entrusted to it by the Convention signed in Rio de Janeiro. Finally, I must mention the Executive Secretary, Dr. Rodríguez-Martín, on whose personal and technical qualities depends the success of an international organization of its kind, and which year after year has grown in membership, and of course, the efficient staff of the Secretariat.

The Spanish Government would like to emphasize to this Commission its willingness to collaborate in the success of ICCAT work and to reaffirm our full support, especially since Spain, Madrid in particular, is the headquarters of ICCAT.

In closing, I would like to say that my greatest pleasure would be that upon returning home, you leave satisfied at having carried out useful and beneficial work. I hope, too, that you will have enjoyed your stay in Madrid, a city which most of you know well.

Many thanks.

Annex 4

OPENING ADDRESS BY DR. L. KOFFI, COMMISSION CHAIRMAN

Honorable Delegates, Observers, Ladies and Gentlemen:

This opening ceremony is a particularly moving occasion for me as Chairman of the Commission, and I feel today an unusual and deep satisfaction. How could I not be happy seeing so many people gathered here for a common purpose, that of attending the Eighth Regular Meeting of the International Commission for the Conservation of Atlantic Tunas. Your presence here in such great numbers at this solemn opening ceremony tells me of the profound interest that you have in the organization that we share in common. First, I should like to welcome you in the name of the Secretariat of the International Commission for the Conservation of Atlantic Tunas, and to welcome you personally to Madrid from which we have been absent for two years.

It is a great pleasure and an emotional experience for me to return to this beautiful Spanish capital, where each of my visits has been an occasion for new experiences and growing admiration.

It is a special pleasure to extend a welcome to the Delegates of Uruguay and Sao Tomé and Principe, whose countries have just joined the Commission. I also wish to greet the observers who are here, and to take the opportunity to ask them to pass to the authorities they here represent so well my best wishes. Distinguished Observers, I thank you in the name of the Delegates.

I want particularly to welcome all of the important personages who honor this ceremony with their presence and increase its prestige and chances of success. The presence here of representatives of most of ICCAT's sister organizations, especially FAO, allows me to perform the pleasant duty of expressing my profound gratitude for what they and their collaborators have done in a remarkably positive sense for our organization, whose credibility is increased with the incorporation of Uruguay and Sao Tomé and Principe. The adhesion to our Convention by two more countries is not only a vote of confidence, but also bears witness to the prestige ICCAT has attained among the countries concerned with the Atlantic tuna fisheries.

Honorable Delegates, the Eighth Regular Meeting of our Commission opens in the new international atmosphere created by the new Law of the Sea Treaty signed last December by 119 countries at Montego Bay, Jamaica. With the introduction of the concept of exclusive economic zones and the extension of national jurisdiction to 200 miles, all of the fishery resources, including the tunas, are now under the jurisdiction of the coastal states. This being the case, it seems appropriate to think very seriously about the delicate question of the repercussions of the development of the Law of the Sea on international fisheries commissions such as ours.

Indeed, we must consider the impact of this new maritime regime on our own organization. Obviously, we must carry out our activities with the objective of achieving the goals assigned by the texts which govern our Commission. And we must consider that

we may not behave like ostriches. We have always acted in a rational manner, and once more our critical spirit will be applied. I know already that ICCAT will remain an organization whose actions mesh harmoniously with those of the new maritime regime. But whatever noble intentions we may have, we must act daily in order to strengthen our organization, and must increase our efforts to avoid any risks of its dissolution.

Honorable Delegates, I want to make two points at this time. First of all, the balance of accounts for the four years in which you have honored me with your confidence as Chairman of the Commission, and second, present concerns will be taken up.

I. Balance Sheet for the Last Four Years

I have had the honor of presiding over our Commission for four years, and the time has now come for me to consider the actions of our Commission and to look to the future. Honorable Delegates, the four years just passed have been particularly active for us, and for this reason I will highlight only major accomplishments. I will try first to outline the outstanding activities of the researchers who work within the Standing Committee on Research and Statistics (SCRS) with the active coordination of the Secretariat. I note as a result of that coordination the growing quantity and quality of the ICCAT publications. I have counted 20 Collective Volumes of Scientific Papers, 8 Data Records, and 10 Statistical Bulletins published by ICCAT in the last four years as evidence of our intense activity. I have also noted the meetings of various working groups that have used and appreciated the enormous capital in statistical and scientific data analyzed and managed in the ICCAT data base.

One may say without risk of contradiction that ICCAT is entering a new stage of maturity. Our outstanding results confirm very clearly the opinion expressed by Dr. John Gulland of FAO about the advantages of the ICCAT type of commission, in that it provides a structure that develops and strengthens the research work of its member countries much more than does a commission which has its own research staff.

The most outstanding ICCAT program, which I have followed step by step over the last four years, has been the International Skipjack Year Program, which ended with the Conference in Tenerife, Spain, in June, 1983. Let me take this occasion to thank the Spanish authorities once again for the facilities made available to our research committee. I can assure you that considerable progress has been made in knowledge of the biology and the dynamics of the skipjack, since I attended the Conference personally. Ten or eleven years ago the skipjack was an unknown species to our researchers--in fact the word "skipjack" was rarely found in the SCRS proceedings. Now it has become the most important species in the Atlantic tuna fisheries, and is probably the best known of all the Atlantic tunas, thanks to the work of the International Skipjack Year Program. More than 40 scientific papers were presented at Tenerife, and clear answers were given to all the questions which were the origin of the the Skipjack Program. The outstanding execution of the Program, the careful attention to budgets and time schedules, the quality, the diversity, and the high level of the results all make our program an example which doubtless few commissions could have achieved as well as we did.

Ladies and gentlemen, that has been the essence of our achievements during the

years 1979-1983. You may make your own judgements in terms of this brief review. As for me, I am convinced that ICCAT has carried out its mission well. The balance sheet of the activities of our organization seems to me both satisfactory and positive.

Our organization has been able to count on the discreet efficiency and the modesty and sustained efforts of all of those at its service in the carrying out of its work. I cannot mention all of them, but I place in the first rank the Secretariat staff, headed by Olegario Rodríguez-Martín, whose experience has been most useful to us. I must also mention the Standing Committee on Research and Statistics with Alain Fonteneau and Jim Beckett, both bringing us a solid background of scientific knowledge, and the Standing Committee on Finance and Administration, with its Chairman, Mr. Blondin, whose competence and integrity have been recognized and utilized by all of us in delicate questions of Staff Rules and financial matters. I must mention here the outstanding personal qualities which Mr. Blondin has always shown.

II. Present Concerns

There are, however, some shadows and disquieting uncertainties which mark the record of my four years as Chairman. I will begin with the work of the SCRS on the subject of bluefin tuna. I note that the SCRS has just arrived at the conclusion that the status of the stocks of the bluefin is completely unknown, including the status of the western stock for which we adopted severe restrictions on catches in 1981 and 1982. Of course, I note with satisfaction that the working group meetings in Trapani and Japan made it possible to clarify the data base and the methods to be used for analyzing the status of the bluefin stocks. But I remain uneasy that our Commission was forced to take severe conservation measures whose scientific validity seems to be very doubtful. I request that the SCRS do everything possible to determine as soon as possible the real status of this stock so that our organization may take the appropriate measures.

I am also concerned by some problems that are looming on the horizon with respect to the tropical tunas. I believe that a major ICCAT responsibility in the coming years will be to determine and implement effective conservation measures for the juveniles of the yellowfin and bigeye tunas, while at the same time allowing the development in skipjack catches that the Skipjack Program led us to expect would be possible. Our researchers confirm what common sense tells us, that large catches of young yellowfin and bigeye of less than 3.2 kg, for example, entail a considerable reduction in the productivity of the stocks of these fast-growing species.

How to optimize the production of these species with their rapid growth, but which are presently close to being over-exploited, without interfering with the development of the fisheries for skipjack, and without prejudicing the fisheries interests of the coastal countries--that is the new challenge facing our Commission.

The challenge is at the same time both technical and political. From the technical point of view, the SCRS has to integrate an enormous volume of statistics covering nearly two-thirds of the Atlantic tuna catches in its analyses. It also has to develop new population dynamics models adapted to the special and complex nature of the problem. I have noted with pleasure that the SCRS has been taking all the necessary steps to solve these problems, and that two working groups have been scheduled, one

dedicated to statistics and the other to management of the resources.

When this work is finished in November, 1984, the ball will be in the Commission's court, if you will permit the expression, and we will then have the responsibility of adopting appropriate conservation measures if they appear necessary. In my opinion, that will be the great challenge for our Commission in the next decade, but I am sure that as we have done in the past we shall face it calmly and efficiently find solutions to these difficult problems.

The image of our Commission should concern all of us. Our cohesion does not imply a limited and passive belonging to or wishing to belong to the same organization. It should represent a common will overall, a unanimous desire to move forward together toward common goals, and to make common sacrifices.

I cannot close my discussion without reiterating my confidence and that of my country, Ivory Coast, in our organization. Honorable Delegates, Ladies and Gentlemen, it is on this note of hope and confidence in our common organization and in renewing my sincere desires that our work will achieve success, that I declare officially open the Eighth Regular Meeting of the International Commission for the Conservation of Atlantic Tunas.

Thank you.

Annex 5

DRAFT AMENDMENT PROPOSED BY FRANCE

ARTICLE XIV BIS

1. This Convention shall be open for signature and (*or*) adherence by the European Economic Community or by any intergovernmental organization made up of States which have transferred to it competence on matters dealt with by the Convention, including the competence to conclude treaties on these matters.

2. Upon deposit of their instrument of formal confirmation or adherence, the European Economic Community or intergovernmental organizations shall become a Contracting Party with the same rights and obligations pursuant to the provisions of the Convention as other Contracting Parties and references in the Convention to the terms "State" and "Government" shall be construed accordingly.

3. Once the European Economic Community or intergovernmental organizations referred to in paragraphs 1 and 2 become a Contracting Party of ~~ICCAT (International Convention for the Conservation of Atlantic Tunas)~~ (*to the present Convention*), the Member States of the European Economic Community or of the intergovernmental organizations shall cease to be Parties (*or can no longer become Parties*) to this Convention insofar as the treaty establishing the European Economic Community or the constituent act of an intergovernmental organization is applicable.

Note: Italicized words in parentheses reflect agreed modifications.

Annex 6

DRAFT AMENDMENT PROPOSED BY THE U.S.S.R.

ARTICLE XIV BIS

1. This Convention shall be open for signature and adherence by any intergovernmental organization made up of States which have transferred to it competence on matters dealt with by the Convention, including the competence to conclude treaties on these matters.

2. Upon deposit of their instrument of formal confirmation or adherence, the intergovernmental organizations shall become a Contracting Party with the same rights and obligations pursuant to the provisions of the Convention as other Contracting Parties and references in the Convention to the terms "State" and "Government" shall be construed accordingly.

3. Once the intergovernmental organizations referred to in paragraphs 1 and 2 become a Contracting Party of ICCAT (International Convention for the Conservation of Atlantic Tunas), the Member States of the intergovernmental organizations shall cease to be Parties to this Convention. From this moment the intergovernmental organization shall have one vote.

Annex 7

REPORTS OF THE MEETINGS OF PANELS 1 - 4

Report of the Meeting of Panel 1

Madrid, Spain, November 1983

1. OPENING

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

2. ADOPTION OF AGENDA

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

3. ELECTION OF RAPPORTEUR

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

4. REVIEW OF PANEL MEMBERSHIP

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

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

Dr. Kwei asked the SCRS Chairman, Mr. J. S. Beckett, to summarize the Committee's report on yellowfin and skipjack.

5-a) Yellowfin

Mr. Beckett reported that while catches had increased considerably in recent years to a high of 143,000 MT in 1981, the 1982 catch was lower (136,000 MT) and it appeared that the 1983 catch would be lower than 1982. Effort has increased significantly, mainly in the purse seine fishery while the baitboat fishery has remained fairly constant.

Although modelling has been attempted, it is still uncertain whether there are one or two stocks. If there are two stocks, then the catch in the eastern Atlantic was apparently above MSY in 1981 and slightly below in 1982.

The large quantities of small yellowfin taken reduce the levels at which MSY would be reached. If the size-at-first-capture was increased, the MSY could be as much as 40,000 MT higher. For the eastern Atlantic fleets, 68 percent of the baitboat catch and 57 percent of the purse seine catch are estimated to be below the legal size. The percent of undersized fish taken in the western Atlantic is uncertain.

The production model for the total Atlantic stock is similar to the model for the eastern Atlantic--the fishery is near the top of the yield curve. There does not appear to be a problem with recruitment in the eastern Atlantic fishery.

5-b) Skipjack

Skipjack catches increased to 150,000 MT in 1982. Most of the catch (118,000 MT) came from the eastern Atlantic, while the developing fishery in the western Atlantic accounted for 32,000 MT. Most of the increase in the western Atlantic catch can be attributed to the increase in effort in the Brazilian baitboat fishery.

The stocks appear capable of sustaining additional effort. In traditional areas this would mean fishing for larger fish, while fishing in new areas could be pursued with present or new techniques such as fish aggregation devices. There is little concern about additional effort because of the short time the fish are in the fishery. The only concern is the impact of additional effort on catches of small bigeye and yellowfin.

6. REVIEW OF POSSIBLE MEASURES FOR THE CONSERVATION OF STOCKS

6-a) Yellowfin

No management measures were recommended by the SCRS; however, Mr. Beckett reiterated that catches were near MSY. He stated that the SCRS hoped to be able to suggest ways to reduce the catch of small fish which would raise the MSY.

The delegate from Spain asked what effect increasing the size-at-first-capture would have on the yield and how this could be done. Also, he asked what was meant by size-at-first-capture: the size of the fish being taken now or the size legislated.

Mr. Beckett responded that the SCRS would try to provide better advice on how to avoid small fish and what impact this would have after data from the International Skipjack Year Program are fully analyzed and studied by the Working Group on Juvenile Tropical Tunas, which is scheduled to meet in 1984. In general, areas where small yellowfin occur should be avoided. The term size-at-first-capture refers to small fish that are being taken now rather than legal size limit. For yellowfin they are first taken from about 1 1/2 to 2 years of age. All fleets must change from fishing undersized fish for it to be effective.

The delegate from Spain was pleased that a better answer would be available after the Working Group on Juvenile Tropical Tunas reviewed the data. He agreed with a multi-species approach. While he was glad to see that there are ways to increase the effort in other fisheries (e.g., skipjack), he was concerned that this might have an impact on yellowfin.

6-b) Skipjack

There were no comments.

7. RESEARCH TO BE CARRIED OUT

7-a) Yellowfin

The SCRS proposed that further analyses be made on the catch of small fish, and that an anaylsis on the state of the western stock be presented. The production models need to be confirmed so the SCRS can be more confident of results.

7-b) Skipjack

The SCRS proposed additional research on biological and environmental factors affecting skipjack. Also more modelling is needed.

Dr. J. Gulland from FAO remarked that, noticing the increased carrying capacity of the purse seine fleet and some upward trends in catch, an analysis of total production of the combined species might provide a better picture since the fleets move between species. He also noted some doubts about the precise location of the MSY, but noted that in the last decade a large increase in fleet size has resulted in only a small increase in the catch of yellowfin. He inquired whether there has been any consideration of holding down fleet size to improve the economic return. He suggested looking at the total fleet size for yellowfin and skipjack together as a different approach.

Mr. Beckett responded that this has not been done but that the SCRS might be able to address the combined catch after the data from the ISYP are further analyzed.

Dr. Kwei asked if areas had been defined from tagging studies where there were more skipjack and less yellowfin.

Dr. Sakagawa responded that this information will probably be available after the single-set data are analyzed.

8. DATE AND PLACE OF NEXT PANEL MEETING

The Panel will meet at the same time and place as the next Commission Meeting.

9. OTHER MATTERS

No other matters were discussed.

10. ELECTION OF PANEL CHAIRMAN

Ivory Coast was nominated and elected unanimously.

11. ADOPTION OF REPORT

The report was adopted.

12. ADJOURNMENT

The meeting was adjourned.

Report of the Meeting of Panel 2

Madrid, Spain, November 1983

1. OPENING

The meeting of Panel 2 was opened by its Chairman, Mr. M. Benjelloun (Morocco).

2. ADOPTION OF AGENDA

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

3. ELECTION OF RAPPORTEUR

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

4. REVIEW OF PANEL MEMBERSHIP

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

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

5-a) Bluefin

The SCRS Chairman, Mr. J. S. Beckett, presented the results of the SCRS studies. Currently two temporally and spatially separate spawning areas are shown and some variable interchange of fish between the west Atlantic and the east Atlantic stocks is known to take place, but the extent of interchange is not yet known.

Mr. Beckett pointed out that in 1982 it was not possible to reach a consensus on the state of the stocks, especially for the west stock. For several years, many countries have expressed their concern about this stock.

For this reason the bluefin problem was studied in considerable depth during 1983 at the Bluefin Workshop held in Japan in September, preceeded by a preparatory meeting in Trapani (Italy) in May. The ICCAT bluefin data base can be considered the best

possible at the present time, but its absolute value is not very good because much essential information is lacking for certain fisheries.

The SCRS Chairman indicated that the regulations in force since 1975 concerning fishing mortality and minimum size seem to have had a possitive effect, particularly in the west Atlantic where catches of small bluefin have been substantially reduced from 1976 on. The effects of these regulations are more difficult to evaluate for the east Atlantic and the Mediterranean.

Once again this year, the SCRS could not advise the Commission on the subject of bluefin management. Numerous recommendations on statistics and research were proposed for 1984, as well as a working schedule, in order to clarify many points. The SCRS feels that these studies can provide better knowledge between now and November, 1984, on the state of the stocks that will allow the SCRS to advise the Commission more exactly.

In order to examine critically the scientific documents that will be presented in 1984, the SCRS decided that the scientists concerned should meet a week before the beginning of the SCRS meeting. They will have sufficient data processing facilities available at the meeting to carry out the analyses that are necessary to test the validity of the different hypotheses and to try to reach agreed conclusions on the state of the stocks.

5-b) Albacore, North

The Chairman of the SCRS pointed out that the North Atlantic albacore stock is currently moderately exploited. An increase in effort may produce an increase in catches, although it must be noted that the stock has been in a phase of reduced recruitment for two years, if the recruitment estimates based on CPUE are not distorted by recent anomalies observed in the environment.

6. REVIEW OF POSSIBLE MEASURES FOR THE CONSERVATION OF STOCKS

6-a) Bluefin

The delegate of the United States congratulated the scientists on the progress made in statistics and analytical methodology and asked the SCRS Chairman if the length of time and the date of the bluefin meeting presently proposed by the SCRS were appropriate.

The SCRS Chairman explained that in 1984 the scientists would have the possibility of carrying out at the time of their meeting all the relevant analyses on the state of the stocks, using data processing facilities.

The United States expressed its concern that the SCRS bluefin studies risked being too rushed or too late in 1984 because of the procedure proposed by the SCRS. Canada expressed similar concern and suggested that the Panel consider recommending that the SCRS hold a special meeting on bluefin stock evaluation before the SCRS meeting.

The SCRS Chairman noted that such a meeting would be possible but that it must be planned well in advance so that all the scientists interested in the meeting could participate. The SCRS Chairman emphasized that because of the numerous problems in

statistics and research that must be solved, such a meeting could only be held shortly before the regular SCRS meeting. The Canadian delegate again emphasized the importance of such a meeting before the SCRS meeting, and invited a working group to meet in Canada in September, 1984. The exact location of this meeting will be decided later. This proposal was supported by Japan, France and the United States and then accepted by the Panel.

The Japanese delegate presented a statement which is attached as Appendix 2. While congratulating the scientists for their progress, he expressed his disappointment in the fact that the SCRS could give no advice on the status of the stocks and called attention to the fact that the measures taken in the west Atlantic in 1981-1982 were not based on reliable scientific evidence. He hoped that the SCRS could reach definite conclusions in 1984 and noted that Japan would cooperate fully to that end. Japan feels that management measures have not been based on reliable science or advice from the SCRS, and that there must be a return to catch levels in place before the adoption of measures at the 1981 ICCAT meeting, if next year there is no firm advice from the SCRS.

The delegate from the United States presented a statement which is attached as Appendix 3. He noted that his country has been expressing concern since 1973 and stated that in spite of the progress achieved by the scientists, the analysis of the current state of the stocks remains a very complex problem. He emphasized that many fishery indices indicate depletion of the west stock. He stated that, on the other hand, he considered that there was not much chance that the SCRS could provide definite conclusions in 1984. Considering these uncertainties, the U.S. delegate recommended extending the measures taken by the Commission in 1982 for two years.

Japan stated that the U.S. reference to research in Report A is misleading because as stated in the Report these preliminary studies are only guides for research and not intended for consideration as a basis for drawing conclusions on the present status of the stocks.

The Canadian delegate expressed his concern on the current state of the bluefin stock in the west Atlantic. He noted the growing uncertainty of the SCRS, which recommended strong conservation measures in 1981 and which did not present any management recommendations in 1983. Taking into account both the uncertainties and the necessity to take some action, Canada recommends prudent action and proposes an extension of the present regulations for one year, while awaiting the 1984 SCRS' conclusions.

The delegate from the United States noted that its proposal was not very different from Canada's and that the extension for two years proposed by his country could be reviewed and modified if warranted by the 1984 SCRS' conclusions.

The Japanese delegate supported Canada's proposal to extend the current regulations for only one year.

There was a consensus among the main countries concerned with the ICCAT regulations in the west Atlantic and the Chairman appointed a working group to draft the regulation accordingly.

The working group appointed by the Chairman proposed a draft regulation for 1984 derived from the text approved by the Commission in 1982. The text of the new regulations is attached as Appendix 4 and was approved by the Panel after being amended

by a suggestion from Cuba, which called for moving the reference to the year 1984 to the preamble of the recommendation.

While accepting the draft regulation, the Korean delegate asked that his country be included, along with Cuba and Brazil, in the exemption for the longline fishery which has incidental catches of bluefin tuna. The delegate from the United States emphasized the need to understand and to put into effect the restrictions imposed; he noted that Korea has not caught bluefin tuna since 1980 and that Article 5 was written in the spirit of protecting the fisheries of two coastal countries which have only small-scale local fisheries.

The French delegate expressed his pleasure with the agreement reached. He supported the regulations that have existed since 1974 on bluefin in the east Atlantic and expressed his opinion that these measures do not need to be reinforced.

6-b) Albacore, North

The state of the stock seems satisfactory and no comments were made by any delegates.

7. RESEARCH NEEDED TO BE CARRIED OUT

The SCRS Chairman asked the Panel to refer to the recommendations on research that appear in the SCRS report. He particularly pointed out the numerous recommendations made during the meeting held in Japan. These recommendations were accepted by the Panel.

8. DATE AND PLACE OF NEXT PANEL MEETING

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

9. OTHER MATTERS

No other matters were discussed.

10. ELECTION OF CHAIRMAN

The delegate from France expressed his country's satisfaction at Morocco's chairmanship of Panel 2. He then proposed that Morocco continue as chairman of the Panel. This proposal was supported by Canada, Portugal, Japan, Korea, Spain and the U.S.A. Morocco was, therefore, re-elected chairman of Panel 2.

11. ADOPTION OF REPORT

The report was adopted by the members of the Panel.

12. ADJOURNMENT

The Chairman adjourned the meeting of Panel 2.

Report of the Meeting of Panel 3

Madrid, Spain, November 1983

1. OPENING

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

2. ADOPTION OF AGENDA

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

3. ELECTION OF RAPPORTEUR

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

4. REVIEW OF PANEL MEMBERSHIP

The Panel members are: Brazil, Japan, South Africa and the United States.

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

Mr. J. S. Beckett, SCRS Chairman, summarized the findings of the scientific committee regarding the southern bluefin and albacore stocks in the south Atlantic, representing the two species of interest to Panel 3.

5-a) Southern bluefin

Three countries fish this stock, which spawns off northeastern Australia. Japan conducts a longline fishery, while Australian harvest techniques rely on baitboats and purse seiners. New Zealand has a coastal handline fishery.

Harvest levels in recent years were in the vicinity of 40,000 MT, of which 500 to 6,000 MT were taken from the Atlantic.

The SCRS has been concerned with dropping catch rates in this fishery. Stock assessment scientists met in Japan this year and confirmed that the stock was in depressed condition but that recruitment has not been affected.

5-b) Albacore, South

The SCRS Chairman stated that this species is considered to comprise a distinct south Atlantic stock. There has been a variable trend in catch with an increase over the last few years. The effort has remained fairly steady. The catch in 1982 was 28,400 MT with 3,700 MT of that coming from the surface fishery in the south Atlantic. The MSY is in the 23,400 to 25,800 MT range. This differs from last year because of the addition of data from Taiwanese fleets. The surface fishery in the western Atlantic could impact the stock if there is an increase in the number of small fish taken. Another year of data should help firm up the production model. There is no concern over recruitment.

6. REVIEW OF POSSIBLE MEASURES FOR THE CONSERVATION OF STOCKS

6-a) Southern bluefin

The SCRS understands that the countries concerned may initiate management measures in this fishery. While the SCRS is interested, the catch in athe Atlantic is low and the SCRS does not suggest any management measures at this time.

6-b) Albacore, South

The SCRS made no recommendations regarding this fishery.

7. RESEARCH NEEDED TO BE CARRIED OUT

7-a) Southern bluefin

No new research was recommended.

7-b) Albacore, South

The SCRS will try cohort analysis as well as production models. There is a need for data from the south Atlantic surface fishery. Also, there is a need to improve the index of recruitment to the stock.

8. DATE AND PLACE OF NEXT PANEL MEETING

The Panel will meet at the same time and place as the next Commission Meeting.

9. OTHER MATTERS

No other matters were discussed.

10. ELECTION OF PANEL CHAIRMAN

Japan was reelected unanimously.

11. ADOPTION OF REPORT

The report was adopted.

12. ADJOURNMENT

The meeting was adjourned.

Report of the Meeting of Panel 4

Madrid, Spain, November 1983

1. OPENING

The meeting of Panel 4 was opened by the Chairman, Mr. V. Bermejo (Spain).

2. ADOPTION OF AGENDA

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

3. ELECTION OF RAPPORTEUR

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

4. REVIEW OF PANEL MEMBERSHIP

All Panel members were present at the meeting.

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

5-a) Bigeye

Bigeye tuna are distributed widely in the tropical and temperate waters of the Atlantic from 40°N to 40°S. The longline fishery is spread throughout almost the entire bigeye habitat.

Following the introduction of longline fishing, the total catches of bigeye increased gradually to 60,000 MT in 1974, and since then fluctuated between 38,800 MT in 1976 and 58,800 MT in 1980. The preliminary 1982 catch is 61,600 MT. The increase in catch in 1980-82 was due to the increased longline catches.

At the present time, the stock structure is uncertain. Therefore, the SCRS assesses the state of the stock(s) under two hypotheses: a single Atlantic-wide stock, and two separate stocks, one in the north and one in the south Atlantic.

For the first hypothesis, the production model analysis indicates that the stock is

currently being exploited at a high level close to the lower estimates of MSY (53,700-114,200 MT). An increase in fishing effort will probably not result in a significant increase in yield given the present pattern of the fishery. Surface fishery catches decreased slightly in 1982; bigeye less than 3.2 kg. made up a large percentage of the catch.

In analyzing the second hypothesis, we see that for the north stock the updated production model analysis resulted in estimates of MSY in the range of 32,900 MT and 74,100 MT. Therefore, if North Atlantic bigeye comprise a unit stock, then an increase in fishing effort using the same fishery scheme could result in a marginal increase in sustainable catch.

The current bigeye regulation has not been effective in reducing the amount of small bigeye tuna in surface fishery catches.

It is recommended that the Working Group on Juvenile Tropical Tunas, which is scheduled to meet in the summer of 1984, use information derived from the International Skipjack Year Program to carry out detailed analyses.

With regard to the south stock, MSY estimates are about 23,700 to 49,200 MT. In 1981, bigeye fishery catches (28,600 MT) were within the range of estimated MSY. A further increase in effort from the present level would not likely be accompanied by an increase in sustainable yield.

5-b) Atlantic bonito

Atlantic bonito is the principal species in the catch of small tunas. Catches of this species reached 12,000 MT in 1982. At present, statistical data and general information on bonito are somewhat scarce.

Detailed studies on Atlantic bonito and other small tuna species are needed in such areas as biological parameters, stock structure information, and on the impact these species have within the eco-system.

5-c) Billfishes

Major catches of billfish are incidental to the tuna longline fisheries of several countries. Secondary fisheries are the directed recreational fisheries of the United States and Senegal. The tropical purse seine fishery takes small quantities of billfish incidentally. Total billfish catches in the last three years have been on the order of 5,000-6,000 MT.

The state of the stocks is not considered entirely satisfactory and there has been a reduction in fishing effort by Japan in recent years. The U.S. delegation stated that efforts should be continued to improve catch and effort data for these species.

5.c.i) Blue marlin

Catches of blue marlin have decreased until 1978, when approximately 1,400 MT were taken. Catches have increased recently and reached 2,300 MT in 1982.

Fishing effort in recent years (1978-1980) appears to be below the level associated with MSY. However, both the sport and commercial fisheries should be monitored and analysis and studies on methods to reduce fishing mortality should be carried out, if necessary.

5-c.ii) White marlin

Catches of white marlin have decreased considerably if we compare recent catch levels (1,200 MT in 1981 and 1,300 MT in 1982) with those of the early 1970's when catch levels were more than 2,000 MT annually. Production models on white marlin do not seem to fit the available data and, therefore, little useful information can be derived from this method.

5-c.iii) Sailfish

Sailfish landings during the 1968-1982 period fluctuated but showed no apparent trends. Landings in 1982 reached 2,400 MT. Age composition data taken from samples of the U.S. recreational fishery indicate that the age as well as the average size of the west Atlantic stock has decreased since the 1950's, although the stock has remained stable in the last 10 to 20 years.

Available statistical data on sailfish are somewhat mixed with data corresponding to spearfish, especially in the case of the longline fishery. The CPUE shows fluctuations but with no clear tendency.

With regards to the east Atlantic stock, the CPUE of the sailfish fishery of Senegal for the period 1970-1980 has also fluctuated with no apparent trend.

Statistics and stock structure information, especially as concerns the longline fishery, should be improved.

5-c.iv) Swordfish

This species is taken mainly by directed longline, harpoon and sport fisheries. It is also caught incidentally by longline and other gears targeting tunas.

Swordfish catches in 1982 were the highest recorded (approximately 21,500 MT) for the 1950-1982 historical series.

No new data pertaining to production model or yield-per-recruit analyses were reported. Therefore, conclusions reached last year are still valid.

After the pertinent section of the SCRS was reviewed, the delegate of the United States commended the scientists for the work carried out, especially in the collection and improvement of statistical information. He also noted his country's support in attaining such objectives.

6. REVIEW OF POSSIBLE MEASURES FOR THE CONSERVATION OF STOCKS

No new stock conservation measures were presented.

7. RESEARCH NEEDED TO BE CARRIED OUT

In the sections of this Report corresponding to each particular species details are given on the principal research activities to be carried out.

8. DATE AND PLACE OF NEXT PANEL MEETING

Panel 4 decided to hold its next meeting at the same place and at the same time as the next Commission Meeting.

9. OTHER MATTERS

No other matters were discussed.

10. ELECTION OF PANEL CHAIRMAN

The Chairman of Panel 4 proposed that the U.S.S.R. be elected Chairman. The proposal was supported by Angola, Canada, Cuba, France, U.S.A. and others.

11. ADOPTION OF REPORT

The report was adopted.

12. ADJOURNMENT

The meeting of Panel 4 was adjourned.

Appendix 1 to Annex 7

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. Review of Panel Membership
5. Review of the Report of the Standing Committee on Research and Statistics (SCRS)
6. Review of possible measures for the conservation of stocks:

Panel 1	*Panel 2*	*Panel 3*	*Panel 4*
a) Yellowfin	a) Bluefin	a) Southern bluefin	a) Bigeye
b) Skipjack	b) Albacore	b) Albacore	b) Atl. bonito
			c) Billfishes
			d) Other species

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

Appendix 2 to Annex 7

JAPANESE STATEMENT ON BLUEFIN TUNA

(Attached to Report of Panel 2)

Japan would like to express its deep appreciation to all the scientists who have worked so diligently on bluefin tuna here at this meeting and during the bluefin tuna workshops held in Italy and Japan this year.

As probably many feel, Japan is disappointed that the SCRS was unable to provide any management recommendations to the Commission on bluefin tuna.

Japan feels that it is imperative that we see completion of all the research and statistical goals contained in the Bluefin Report. We sincerely hope that the work will allow us to make sound decisions next year toward the proper management of the bluefin stocks.

If we may, Japan would like to refresh the Commissioners' minds by pointing out that in 1981 ICCAT adopted management measures that drastically restricted bluefin catch limits in the western Atlantic. The following year, 1982, the SCRS found the science on which this decision was based to be erroneous and it was unable to give any advice to the Commission. However, stringent catch limits were retained.

Japan objected strongly in both 1981 and 1982 to these drastic measures and now in 1983, the SCRS once again reports that it is uncertain about the status of the bluefin stocks and can make no recommendation.

Japan objects to the continuation of this type of procedure but will wait another year with the following reservation.

It is the position of Japan that, if next year the SCRS is again unable to give firm advice with regard to the western Atlantic bluefin, we must return to management measures in place before those adopted at the 1981 ICCAT meeting.

Japan finds that the actions which this Commission has taken on bluefin tuna are not based on reliable scientific evidence. We beg all countries to recognize this and seriously consider the destructive precedent that is being set. We must recognize the danger inherent in such behavior for a Commission dedicated to maintaining the populations of tunas at levels which will permit the maximum sustainable catch for food.

Appendix 3 to Annex 7

STATEMENT BY THE U.S. DELEGATION

(Attached to Report of Panel 2)

Bluefin tuna management is the most serious challenge to face ICCAT in its 15-year history. While considerable efforts have been expended by the ICCAT scientists, information and data have not been sufficient to indicate that actions taken by the Commission regarding bluefin tuna have thus far rebuilt the stock.

We have found that the nature of the bluefin tuna fishery has made analysis extremely difficult. While new advice has not been forthcoming this year from the SCRS on this species, given past information and other factors, the Commission previously has taken measures which, in its judgement, would result in positive benefits to the resource. From isolated information in the SCRS reports and information from participants in the U.S. fishery, we have seen trends that have indicated depressed stock abundance. To address these trends, catch limitations were adopted, and we may be seeing early results from these restrictions. For example, we note that the SCRS has reported that the exceptionally large 1973 year-class has entered the spawning area in the Gulf of Mexico.

The U.S. is further concerned that the SCRS will not be able in only one year to complete the tasks it has outlined for completing a new virtual population analysis of the bluefin tuna stock abundance. The management difficulties which will result from erratic changes in the ICCAT recommendations are quite serious. We, therefore, propose that Panel 2 extend for two years the current management regime with a provision that a review be conducted in 1984 and modifications be considered if the scientific information warrants.

In view of the demonstrated history of bluefin tuna fishing, the U.S. cannot accept a return to increased bluefin tuna catches in the western Atlantic until such time as stock recovery has been conclusively documented.

In the absence of further technical evidence to the contrary, the U.S. position will continue to be that historic declines in population size, both for recruits and spawning stocks, and the work of SCRS over recent years are sufficiently convincing to warrant a continuation of the present conservation program for bluefin tuna, including closure of the spawning areas.

Appendix 4 to Annex 7

PROPOSED NEW REGULATIONS FOR THE ATLANTIC BLUEFIN TUNA CATCH

(Attached to Report of Panel 2)

Recognizing that we are uncertain of the status of the bluefin tuna stock in the western Atlantic,

Taking into account that the SCRS was unable to give any advice on bluefin tuna at the Eighth Regular Meeting of the Commission,

The Commission recommends that during 1984:

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

a) the Contracting Parties whose nationals have been actively fishing for bluefin tuna in the western Atlantic take measures to limit the catch for scientific monitoring in 1984 to 2,660 MT metric tons (MT);

b) the catch of 2,660 MT be taken by these Contracting Parties in the same proportions as previously agreed for 1983, and

c) further scientific investigations, including the work of the Working Group on Bluefin Tuna that is to meet prior to the next SCRS meeting, be carried out in order that the Fourth Special Meeting in November, 1984, has additional information upon which to base bluefin tuna management measures.

SECOND: That the adoption of the above measures concerning the western Atlantic must not imply any modification in the ICCAT recommendation adopted in 1975 concerning a minimum weight of 6.4 kg adopted for the entire Atlantic and fishing mortality limited to recent levels in the eastern Atlantic; this latter measure being extended until a new decision is made by ICCAT.

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

FOURTH: That the Contracting Parties take measures to prohibit any transfer of fishing effort from the western Atlantic to the eastern Atlantic in order to avoid increasing fishing mortality of bluefin tuna in the eastern Atlantic.

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

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

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

EIGHTH: That in the event that the SCRS is not able to provide new scientific advice on the status of the stock of bluefin tuna in the western Atlantic, the Commission will consider, at the Fourth Special Meeting, appropriate management measures, including the continuation of the current management measures, throughout 1985.

Annex 8

REPORT OF THE MEETING OF THE INFRACTIONS COMMITTEE

1. OPENING OF THE MEETING

Dr. L. Koffi, Chairman of the Commission, opened the first meeting of the Committee. He reviewed the recent history with regard to ICCAT port inspection, drawing attention to the fact that at the last ICCAT meeting it had been decided definitely by majority vote to establish an Infractions Committee. The delegate of the United States noted that in his opinion, and considering the problems with continued landings of undersized yellowfin and bigeye, it was most opportune for the Committee to start its work at this time.

The Executive Secretary reviewed developments since the last meeting of the Commission, and said that five countries (Cuba, Japan, Portugal, Spain and the U.S.A.) had replied to his letter of February 16, 1983.

2. ELECTION OF CHAIRMAN FOR 1983 SESSION

Dr. Koffi proposed that Cuba chair the Committee, and this proposal was endorsed by Angola, France, Gabon, Ivory Coast, Morocco, Spain and the U.S.A. Cuba proposed Mr. B. García Moreno, who assumed the chair.

3. ADOPTION OF AGENDA AND ARRANGEMENTS FOR THE MEETING

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

4. ELECTION OF RAPPORTEUR

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

5. NATIONAL REGULATIONS ON SPECIES

The Executive Secretary reviewed the status of proposals adopted by the Commission for the conservation of yellowfin, bigeye and bluefin tuna stocks (COM/83/24), indicating that the document contained a resume of the conservation recommendations adopted by ICCAT and a record of the notifications received from the member countries on their implementation of appropriate regulations. Japan and Canada pointed out that the document was not complete or entirely correct with regard to their actions. The

Executive Secretary took note of the corrections, and requested that they be confirmed in writing, and that all countries keep the Secretariat informed by correspondence. A corrected version of the table from COM/83/24 is attached as Appendix 2.

6. NATIONAL LEGISLATION ON PORT INSPECTION

The Chairman asked that all countries report on the current status of national legislation. The U.S.A. pointed out that its current internal procedures consisted of adopting domestic regulations under existing legislation which implemented the ICCAT Convention. The formal issuance of appropriate regulations is expected prior to the end of the year. In the meantime, ICCAT recommendations are consistently enforced for U.S. flag vessels. France noted that it has been studying application of the ICCAT recommendations, but since essential elements such as forms, identity cards, etc., have been missing, it has not yet begun enforcement. As soon as these materials are available, the plan will be implemented. Japan responded that it was encountering some difficulties with regard to domestic procedures necessary for adopting the scheme, since there was no clear stipulation provided in the ICCAT Convention for the scheme. However, as Japan recognizes the importance of cooperating with the scheme, Japanese tuna fishermen have been instructed to cooperate voluntarily with inspections carried out at ports of call. Japan requested that, because Japanese fishermen are very sensitive about the high quality of tuna demanded by the national market for "sashimi," all countries carrying out inspections should take into full account the provisions of Paragraph 3 that inspections should be done with the minimum of interference and inconvenience to the vessel, avoiding degredation of the quality of the fish.

Portugal reported that it expected to have port inspection in place in 1984, and that it needed guidelines on questions such as the application of certain paragraphs of the ICCAT inspection scheme. The delegate from Portugal also suggested that it might be appropriate for the SCRS to help standardize guidelines, particularly with respect to sampling of catches. Spain reported that the appropriate ministerial order had been drafted, and at the finish of the current meeting the order would be implemented.

The Executive Secretary noted that he was very satisfied with the progress made to date, but that there was still much to be done, such as the design of standard forms, detailed instructions for inspections, etc. It is clear that these are among the tasks of this Committee, and it appears that many of them could be completed in 1984. Of course, as experience accumulates, there will be a considerable amount of refinement and updating to be done.

7. REPORT OF PORT INSPECTIONS CARRIED OUT IN 1983

The U.S.A. noted its view that inspections carried out under the port inspection scheme referred primarily to foreign vessels; compliance by domestic vessels had been consistently monitored.

8. ADOPTION OF AN IDENTITY CARD FOR INSPECTORS

The Chairman called the attention of the Committee to the design of the proposed

card on the last page of COM/83/25, and copies of the cards used by ICSEAF and the card proposed for ICCAT were distributed. Several delegations commented on the cards, and the Chairman appointed a small working group, chaired by Cape Verde, with members from France, Spain and the U.S.A. to bring firm recommendations to the Committee. The rapporteur was asked to assist the group.

The Chairman of the working group reported that the preferred form for the identification card was the ICSEAF type, but with dimensions of about 6.5 by 10 cm, a convenient wallet size. Use of a fourth language on the card for those countries desiring it should be optional. These recommendations were accepted by the Committee.

9. ADOPTION OF AN INSPECTION FORM AND QUESTIONNAIRE

The Chair requested that the small working group also examine this question and report back to the Committee.

The Chairman of the working group reported that group found the proposed form in COM/83/25 generally satisfactory, but suggested the following modifications:

a) Space should be provided after the inspector's signature for the vessel captain to enter any observations, disagreements with the inspector's findings, etc.

b) Item 12 should be modified to permit the recording of the amount of bluefin tuna of less than 120 cm in accordance with the ICCAT recommendations in Appendix 4 to Annex 8 of the report of the 1982 meeting.

c) Standard sampling forms should be used insofar as possible for inspections. ICCAT Form 3-1 as shown in the "Field Manual" or a close equivalent is recommended.

The group called the attention of the Committee to the fact that there may be some ambiguity in the recommendation concerning 120 cm bluefin, in that it is not clear whether the 15 percent limitation applies to individual countries.

These recommendations were accepted by the Committee.

10. PLAN FOR THE APPLICATION OF THE INSPECTION SCHEME

The Executive Secretary pointed out that the ICCAT scheme envisioned notification through the Secretariat of whom would be conducting the inspections. The delegate from the U.S.A. pointed out that listing actual names of inspectors might not be a good idea, since there would be considerable problems with keeping lists updated, notifying all countries of the names of all inspectors, etc. She suggested that it might be more appropriate in some cases to exchange through the Secretariat the names of national agencies, such as the National Marine Fisheries Service and the U.S. Coast Guard, authorized to carry out inspections on behalf of the countries. South Africa supported this proposal. It was generally agreed that this would be an acceptable alternative to furnishing the Secretariat with the names of individual inspectors and that such individuals be permitted to use their own official identification cards.

11. DATE AND PLACE OF THE NEXT COMMITTEE MEETING

It was agreed that the Committee would next meet during the Commission's next meeting.

12. OTHER MATTERS

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

13. ELECTION OF CHAIRMAN FOR THE 1984-1985 BIENNIAL PERIOD

Spain nominated Cuba as Chairman, and there was unanimous agreement.

14. ADOPTION OF REPORT

The report was adopted.

15. ADJOURNMENT

The meeting was adjourned.

Appendix 1 to Annex 8

AGENDA

1. Opening of the meeting
2. Election of Chairman for 1983 session
3. Adoption of Agenda and arrangements for the meeting
4. Election of Rapporteur
5. National regulations on species
6. National legislations on port inspection
7. Report of port inspections carried out in 1983
8. Adoption of an identity card for inspectors
9. Adoption of an inspection form and questionnaire
10. Plan for the application of the inspection scheme
    a) National correspondents
    b) Nomination of inspectors
    c) Application dates
11. Date and place of the next Committee meeting
12. Other matters
13. Election of Chairman for the 1984-1985 biennial period
14. Adoption of Report
15. Adjournment

Status of the regulatory measures on size limits adopted by the member countries (as of April 30, 1984)

Species	YELLOWFIN	BIGEYE	BLUEFIN
Type of Regulation	*Size limit (3.2 kg)*	*Size limit (3.2 kg)*	*Size limit (6.4 kg)*
Area of application	*Entire Atlantic*	*Entire Atlantic*	*Entire Atlantic*
Date of entry into effect	*July 1, 1973*	*September 7, 1980*	*August 10, 1975*
Date of expiration	*Indefinite period*	*End of 1984*	*Indefinite period*
Angola	Jun. 17, 1979		No fishing
Benin			
Brazil	Feb. 23, 1973	Nov. 17, 1980*	Aug. 18, 1977
Canada	Sep. 4, 1973	No fishing	Feb. 17, 1976
Cape Verde			
Cuba	Jul. 1, 1973	Sep. 7, 1980	No fishing
France	Jun. 29, 1973	Mar. 3, 1981	Aug. 8, 1975
Gabon	No fishing or landings	Measures being considered	No fishing or landings
Ghana	Jun. 19, 1976		
Ivory Coast	Mar. 2, 1970	Mar. 2, 1970	
Japan	Jun. 14, 1973	Sep. 7, 1980	Apr. 16, 1975
Korea	Jan. 21, 1973	Sep. 15, 1980	Dec. 17, 1975
Morocco	No fishing		
Portugal	Nov. 26, 1973	Jul. 17, 1981	Nov. 27, 1976
Sao Tomé & Principe			
Senegal	Jul. 2, 1976	Jul. 2, 1976	
South Africa	May, 1973	Dec. 5, 1980	Jun. 27, 1975
Spain	May 29, 1974		Mar. 3, 1975
Uruguay			
U.S.A.	Nov. 5, 1975	Mar. 30, 1981	Aug. 13, 1975
U.S.S.R.	Sep. 28, 1978	Nov. 4, 1980	Sep. 28, 1978
Venezuela			

*Awaiting written confirmation.

Status of bluefin regulatory measures (other than size limit) adopted by the member countries (as of April 30, 1984)

Type of regulation	*Limiting fishing mortality to recent levels*	*Extensions*				*Catch prohibited, except for monitoring purposes*		
		1st	*2nd*	*3rd*	*4th*	*(COM-81)*	*(COM-82)*	*(COM-83)*
Area of application	*Entire Atlantic*	*Entire Atlantic*	*Entire Atlantic*	*Entire Atlantic*	*E. Atl. only*	*West Atlantic only*		
Date of entry into effect	*Aug. 10, 1975*	*Aug. 10, 1976*	*Oct. 10, 1978*	*Sep. 4, 1980*	*Jul. 21, 1982*	*Feb., 1982*	*Jan., 1983*	*Jan., 1984*
Date of expiration	*Aug. 10, 1976*	*Aug. 10, 1978*	*Aug. 10,1980*	*Aug. 10,1982*	*Indefinite*	*Feb., 1984*	*Jan., 1984*	*Jan., 1985*
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		Jun. 14, 1982	Jun. 21, 1983	
Cape Verde								
Cuba	-------- No fishing for the three-year period ----------							
France		Dec. 27, 1974	Dec. 27,1974	Dec. 27,1974				
Gabon	----------			No fishing or landings				
Ghana								
Ivory Coast								
Japan	Apr. 16, 1975	Apr. 16, 1975	Apr. 16,1975	Apr. 16,1975	Mar. 3,1982	Mar. 3,1982	Mar. 7, 1983	
Korea	Dec. 17, 1975	Dec. 17, 1975	Oct. 14, 1978	Sep. 15, 1980				
Morocco								
Portugal		Nov. 27, 1976	**	**	**			
Sao Tomé-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		Jun. 11, 1982	Jun. 17, 1983	
U.S.S.R.	Sep. 28, 1978	Sep. 18, 1978						
Venezuela								

*In process.

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

Annex 9

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

Madrid, Spain, November, 1983

Table of Contents

Item 1. OPENING OF THE MEETING

1.1 The 1983 meeting of the Standing Committee on Finance and Administration (STACFAD) was opened by the Chairman, Mr. C. J. Blondin (U.S.A.). The Chairman thanked the Committee for its support of his work as Chairman and commended the Secretariat staff for their efficient work.

Item 2. ADOPTION OF AGENDA

2.1 After reviewing the Commission Agenda items referred to the Committee, the Tentative Agenda, prepared prior to the meeting by the Secretariat, was adopted (Appendix 1).

Item 3. ELECTION OF RAPPORTEUR

3.1 The Secretariat was nominated rapporteur.

Item 4. PANEL MEMBERSHIP

4.1 Panel membership, referred to in document COM/83/13, was reviewed.

4.2 In noting that many member countries do not belong to any panel, the Chairman asked if any country wished to participate in or withdraw from a Panel. As no comments were made to this effect, the current Panel membership, as shown in COM/83/13, was confirmed.

Item 5. ADMINISTRATIVE REPORT

5.1 The Executive Secretary presented and explained the Administrative Report (COM/83/10). He reported that Uruguay and Sao Tomé and Principe had become new members of the Commission during 1983. He also outlined Secretariat and Commission activities, the ICCAT intersessional meetings, meetings at which the Commission was represented, cooperation with other organizations, ICCAT data processing work, training courses organized by the Commission, ICCAT publications, results of the Skipjack Year Program, trips made by the Secretariat staff and new Article 29 of the Staff Rules.

5.2 The Committee reviewed and adopted the Administrative Report and recommended it to the Commission for approval.

Item 6. RELATIONS WITH OTHER ORGANIZATIONS

6.1 The Committee reviewed the relationship the Commission maintains with various organizations (COM/83/10) and found them to be satisfactory.

Item 7. COMMISSION PUBLICATIONS

7.1 The Committee reviewed the pertinent sections of the Administrative Report concerning Commission publications (COM/83/10) and recommended that the current publication policy be maintained.

Item 8. AUDITOR'S REPORT, 1982

8.1 The 1982 Auditor's Report (original in Spanish), with summary translations in English and French, was circulated to the head of each delegation in mid-1983. The Report was adopted by the Committee and then recommended to the Commission for adoption.

Item 9. FINANCIAL STATUS OF THE REGULAR BUDGET – 1983

9.1 The Financial Report (COM/83/11) was presented and explained in detail by the Executive Secretary. He noted the favorable exchange rate in 1983 of the U.S. dollar, in which the budget is planned, and the Spanish peseta, in which many of the expenditures are incurred. As a result, the financial status of the Commission is good and a positive balance of approximately $228,900 is forecast for the end of this fiscal year.

9.2 The Executive Secretary pointed out the member country contributions still pending payment (approximately $270,000). Fortunately, no difficulties were encountered in 1983 because of the balance in the Working Capital Fund and also because expenditures for 1983 were considerably less than budgeted.

9.3 The Committee noted that a recommendation was made by the SCRS to purchase a word processing/micro-computer system with analytical and graphic capabilities for the Secretariat. The Committee recommended that the Commission authorize this

purchase and that about $40,000 of the positive balance foreseen for the end of this fiscal year be used for this purchase.

9.4 The Committee postponed discussion of the remainder of the positive balance foreseen for the end of fiscal year 1983 until the 1984-1985 budgets and status of the Working Capital Fund are discussed.

Item 10. WORKING CAPITAL FUND – REGULAR BUDGET

10.1 The Committee reviewed Statement 9 of the Financial Report (COM/83/11) and noted that there is a theoretical balance of $711,755 in the Working Capital Fund. The actual balance in the Fund is about $270,000 less than that mentioned above due to contributions still pending payment.

10.2 The Commission decided to discuss this matter together with the positive balance of the 1983 budget under Agenda Item 11.

Item 11. REGULAR BUDGET FOR THE BIENNIAL PERIOD 1984-1985

11.1 The Executive Secretary presented the Regular Budget for the 1984-1985 biennial period (COM/83/12). Explanations were given for each budget chapter.

11.2 The proposed budget for the 1984-1985 biennial period was reviewed in light of recommendations made by the SCRS and other proposals on various Commission activities made by the Commission. Although there are uncertainties regarding future inflation rates and fluctuations in the U.S. dollar/peseta exchange rates, the Executive Secretary noted that the proposed budget for 1984, which is 10 percent less than the 1983 budget, and the 1985 budget which is the same as for 1983, are the best estimates possible at this time.

11.3 The Committee commended the Executive Secretary for his sound financial management of Commission funds which has made it possible to reduce the 1984 budget from the previous level.

11.4 The delegate from Spain noted that the Executive Secretary had prepared the budget using an exchange rate of 120 pesetas to 1 US dollar. The Executive Secretary had noted that approximately 65 percent of the expenditures were in pesetas. Notwithstanding other particulars, the current budget should not exceed $600,000. According to ICCAT data, from which Appendix 4 was prepared, the Working Capital Fund has an excessive balance, if we bear in mind the purpose of the this Fund and the total annual budget. The delegate from Spain requested the Chairman to open debate concerning this matter.

11.5 The Executive Secretary responded that several budget items (e.g. travel, computer services, meeting expenses, etc.) are actually expended in dollars and not in pesetas. He insisted on the need to maintain a certain level in the Working Capital Fund. On the other hand, he noted that there is approximately $710,000 in the Working Capital Fund plus about $190,000 corresponding to the positive balance of the 1983 Budget, less about $270,000 in contributions still pending payment, which consequently amounts to about $630,000 in cash.

11.6 The delegate from Ivory Coast emphasized the need to maintain a reasonable balance in the Working Capital Fund to assure the healthy operation of the Commission.

11.7 Canada proposed a total 1984 budget of $700,000, including an allocation of $100,000 to this budget from the Working Capital Fund. The Chairman of the Committee further clarified for the Committee that $600,000 of the total budget should be covered by country contributions and $100,000 should be covered by the Working Capital Fund. It was further noted that the 1985 Budget would be approximately 10 percent more than the 1984 Budget.

11.8 Noting that a sudden change in the budget may cause problems for increases in future budgets, the U.S. supported the Canadian proposal. Ivory Coast also supported the solution proposed by Canada.

11.9 Spain, while accepting the Canadian proposal, emphasized the importance of reviewing the Working Capital Fund and its possible application as regards the 1985 Budget and proposed that a working group be formed to study the Working Capital Fund and related matters.

11.10 It was agreed that the working group be open to participation by any member country and a February 1, 1984, deadline was set for countries to notify the Secretariat of their desire to participate in the group. In this respect, the Committee requested the Executive Secretary to circulate a document on the status of the Working Capital Fund and its alternative applications to the member countries for comments and/or suggestions.

11.11 The budget estimates for 1984-1985 (Appendix 2) were adopted with the reservation that the Commission review the 1985 Budget in light of the study and recommendations made by the working group at its next meeting.

Item 12. MEMBER COUNTRY CONTRIBUTIONS TO THE REGULAR BUDGET, 1984-1985

12.1 The Committee agreed to calculate the member country contributions based on the catch and canning figures for 1981, the year for which the most complete data are available.

12.2 The member country contributions for 1984 and 1985, calculated according to the formula outlined in Article X of the Convention, are attached herewith as Appendix 3 to this Report.

Item 13. FINANCIAL STATUS OF THE SKIPJACK PROGRAM

13.1 The Committee reviewed the 1983 Skipjack Budget, which supposedly will cover all expenses incurred up to the end of the Program in mid-1984 (including the skipjack publication). Member country contributions still pending payment to this Budget total $15,318. At present, a positive balance of $21,066 is foreseen upon termination of all Program activities in mid-1984.

13.2 Once all Program activities have been completed, and should there be a positive balance of skipjack funds, the Committee recommended that this balance be deposited to the Working Capital Fund of the Regular Budget.

Item 14. TRAINING PROGRAM FOR DEVELOPING COUNTRIES

14.1 The Committee noted with pleasure that two statistical training courses were carried out in 1983 by the Commission, and many scientists and technicians from developing member countries participated in the courses. Particular mention was made of funding provided for several trainees by the European Economic Community and CECAF. A special note of appreciation was extended to the CRO (Abidjan) and the I.E.O (Tenerife) for having provided facilities to hold this year's courses.

Item 15. DATE AND PLACE OF THE NEXT REGULAR MEETING OF THE COUNCIL OR SPECIAL MEETING OF THE COMMISSION

15.1 The Committee recommended that a Special Commission Meeting be held in 1984, rather than a Council Meeting, in view of the important matters pending discussion next year which will require a decision by the Commission.

15.2 The Committee decided that the next meeting should start on Wednesday, November 7, 1984. The scientific meetings will start the week preceding the Commission Meeting.

15.3 The delegate from France proposed that the 1984 meeting be held in Las Palmas, Canary Islands (Spain). The Executive Secretary noted that holding a meeting outside Madrid represents a considerable increase in meeting costs. The Committee then recommended that the Executive Secretary carry out a detailed comparative study on the budgetary implications involved in holding the meeting in Las Palmas or other appropriate city in Spain. Based on this study, the Executive Secretary, in consultation with the STACFAD Chairman and the Commission Chairman, should decide on the meeting place.

Item 16. ITEMS TO BE CONSIDERED BY THE COUNCIL AT ITS NEXT MEETING

16.1 Since the Council will not be meeting in 1984, this Agenda Item was not discussed.

Item 17. DATE AND PLACE OF THE NEXT REGULAR MEETING OF THE COMMISSION

17.1 Since a Special Meeting of the Commission is to be held in 1984, the Committee recommended that this Agenda Item be discussed at the1984 Commission Meeting.

Item 18. OTHER MATTERS

18.1 In noting the increasing number of ICCAT member countries whose official

language is Portuguese, the delegate of Portugal suggested studying the possibility of introducing Portuguese as the fourth official language of the Commission. Portugal recognized that such a procedure would require an amendment to the ICCAT Convention and would also involve budgetary implications. Therefore, the delegate of Portugal requested that the working group set up to study the Working Capital Fund evaluate, in consultation with the Executive Secretary, the consequences and financial implications of his suggestion.

Item 19. ELECTION OF STACFAD CHAIRMAN

19.1 The outgoing Chairman, Mr. C. J. Blondin, expressed his satisfaction at having chaired this Committee and thanked all the Committee members for their assistance. Mr. Blondin proposed Mr. J. J. Chao (Spain) as the next STACFAD Chairman. His nomination was supported unanimously by the Committee. Therefore, Mr. Chao was elected STACFAD Chairman for the next biennial period.

Item 20. ADOPTION OF REPORT

20.1 The Report was adopted.

Item 21. ADJOURNMENT

21.1 The meeting was adjourned.

Appendix 1 to Annex 9

Agenda

1. Opening of the meeting
2. Adoption of Agenda
3. Election of Rapporteur
4. Panel membership
5. Administrative Report
6. Relations with other organizations
7. Commission publications
8. Auditor's Report – 1982
9. Financial status of the Regular Budget – 1983
10. Working Capital Fund – Regular Budget
11. Regular Budget for the Biennial Period 1984-1985
12. Member country contributions to the Regular Budget 1984-1985
13. Financial status of the Skipjack Program
14. Training program for developing countries
15. Date and place of the next Regular Meeting of the Council or Special Meeting of the Commission
16. Items to be considered by the Council at its next meeting
17. Date and place of the next Regular Meeting of the Commission
18. Other matters
19. Election of STACFAD Chairman
20. Adoption of Report
21. Adjournment

Appendix 2 to Annex 9

REGULAR BUDGET 1984-85
(US$)

	1984 Budget (700,000)	*1985 Estimated Budget (770,000)*
Chapter		
1. Salaries	280,000	308,000
2. Travel	14,000	15,400
3. Annual Meeting	72,000	79,200
4. Publications	30,000	33,000
5. Office Equipment	10,000	11,000
6. General Operating Expenses	55,000	60,500
7. Miscellaneous Expenses	9,000	9,900
Sub-total	*470,000*	*517,000*
8. Coordination of Research		
a) Salaries	150,000	165,000
b) Travel	12,000	13,200
c) Equipment	5,000	5,500
d) Data Processing	36,000	39,600
e) Meetings during the year (Sub-Committees, Working Groups, etc.) and/or Training Courses	22,000	24,200
f) Miscellaneous Expenses	5,000	5,500
Sub-total	*230,000*	*253,000*
9. Contingencies	0	0
TOTAL	700,000	770,000
From Working Capital Fund	**100,000**	**100,000**
From Country Contributions	**600,000**	**670,000**

Table of Member Country Contributions to the 1984 Regular Commission Budget

Total Budget - $700,000 / Contributions (K) - $600,000

Country	*A* *No.*	*B* *%*	*C*	*D* *(1,000 MT)*	*E*	*F* *%*	*G* *$*	*H* *$*	*I* *$*	*J* *$*	*K* *$*
Angola	2	5.17	5.209	1.377	6.586	1.24	1,000	2,000	9,345	4,482	16,827
Benin	0	1.72	.003	0	.003	0.00	1,000	0	3,115	2	4,117
Brazil	2	5.17	20.197	0	20.197	3.80	1,000	2,000	9,345	13,745	26,089
Canada	2	5.17	1.166	3.254	4.420	0.83	1,000	2,000	9,345	3,008	15,353
Cape Verde	1	3.45	2.735	.250	2.985	0.56	1,000	1,000	6,230	2,031	10,261
Cuba	2	5.17	9.700	.799	10.499	1.98	1,000	2,000	9,345	7,145	19,490
France	2	5.17	62.826	25.200	88.026	16.58	1,000	2,000	9,345	59,904	72,249
Gabon	1	3.45	0	0	0	0.00	1,000	1,000	6,230	0	8,230
Ghana	1	3.45	20.184	3.297	23.481	4.42	1,000	1,000	6,230	15,979	24,209
Ivory Coast	1	3.45	17.560	6.400	23.960	4.51	1,000	1,000	6,230	16,305	24,535
Japan	4	8.62	52.975	0	52.975	9.98	1,000	4,000	15,575	36,051	56,625
Korea	3	6.90	31.835	0	31.835	6.00	1,000	3,000	12,460	21,664	38,124
Morocco	2	5.17	11.795	.924	12.719	2.40	1,000	2,000	9,345	8,656	21,000
Portugal	3	6.90	6.848	4.593	11.441	2.15	1,000	3,000	12,460	7,786	24,246
Sao Tomé & Principe	0	1.72	0	0	0	0.00	1,000	0	3,115	0	4,115
Senegal	1	3.45	2.323	2.900	5.223	0.98	1,000	1,000	6,230	3,554	11,784
South Africa	1	3.45	2.466	.539	3.005	0.57	1,000	1,000	6,230	2,045	10,275
Spain	3	6.90	135.569	33.200	168.769	31.79	1,000	3,000	12,460	114,851	131,311
Uruguay	0	1.72	.328	2	.330	0.06	1,000	0	3,115	225	4,340
U.S.A.	4	8.62	17.795	32.317	50.112	9.44	1,000	4,000	15,575	34,102	54,677
U.S.S.R.	2	5.17	13.834	.564	14.398	2.71	1,000	2,000	9,345	9,798	22,143
Total	*37*	*100.00*	*415.348*	*115.616*	*530.964*	*100.00*	*21,000*	*37,000*	*180,666*	*361,333*	*600,000*

A – Panel membership.
B – Percentage of payments for annual membership and panel membership (G + H).
C – 1981 catch (live weight).
D – 1981 canned production (net product weight).
E – Total (C + D).
F – Percentage distribution of E.
G – Payment of $1,000 annual membership contribution.
H – Payment of $1,000 for each panel membership.
I – 1/3 of $542,000 = ($600,000 - $58,000 (G + H)) distributed percentage-wise according to column B.
J – 2/3 of $542,000 = ($600,000 - $58,000 (G + H)) distributed percentage-wise according to column F.
K – Total (G + H + I + J).

Table of Member Country Contributions to the 1985 Regular Commission Budget

Total Budget - $770,000 / Contributions (K) - $670,000

Country	*A* *No.*	*B* *%*	*C*	*D* *..... (1,000 MT) .....*	*E*	*F* *%*	*G* *$*	*H* *$*	*I* *$*	*J* *$*	*K* *$*
Angola	2	5.17	5.209	1.377	6.586	1.24	1,000	2,000	10,552	5,061	18,612
Benin	0	1.72	.003	0	.003	0.00	1,000	0	3,517	2	4,520
Brazil	2	5.17	20.197	0	20.197	3.80	1,000	2,000	10,552	15,520	29,071
Canada	2	5.17	1.166	3.254	4.420	0.83	1,000	2,000	10,552	3,396	16,948
Cape Verde	1	3.45	2.735	.250	2.985	0.56	1,000	1,000	7,034	2,294	11,328
Cuba.	2	5.17	9.700	.799	10.499	1.98	1,000	2,000	10,552	8,068	21,619
France.	2	5.17	62.826	25.200	88.026	16.58	1,000	2,000	10,552	67,640	81,192
Gabon.	1	3.45	0	0	0	0.00	1,000	1,000	7,034	0	9,034
Ghana.	1	3.45	20.184	3.297	23.481	4.42	1,000	1,000	7,034	18,043	27,078
Ivory Coast	1	3.45	17.560	6.400	23.960	4.51	1,000	1,000	7,034	18,411	27,446
Japan	4	8.62	52.975	0	52.975	9.98	1,000	4,000	17,586	40,707	63,293
Korea	3	6.90	31.835	0	31.835	6.00	1,000	3,000	14,069	24,462	42,531
Morocco	2	5.17	11.795	.924	12.719	2.40	1,000	2,000	10,552	9,773	23,325
Portugal.	3	6.90	6.848	4.593	11.441	2.15	1,000	3,000	14,069	8,791	26,860
Sao Tomé & Principe	0	1.72	0	0	0	0.00	1,000	0	3,517	0	4,517
Senegal	1	3.45	2.323	2.900	5.223	0.98	1,000	1,000	7,034	4,013	13,048
South Africa. . . .	1	3.45	2.466	.539	3.005	0.57	1,000	1,000	7,034	2,309	11,344
Spain	3	6.90	135.569	33.200	168.769	31.79	1,000	3,000	14,069	129,684	147,753
Uruguay	0	1.72	.328	2	.330	0.06	1,000	0	3,517	254	4,771
U.S.A..	4	8.62	17.795	32.317	50.112	9.44	1,000	4,000	17,586	38,507	61,093
U.S.S.R.	2	5.17	13.834	.564	14.398	2.71	1,000	2,000	10,552	11,064	24,615
Total.	*37*	*100.00*	*415.348*	*115.616*	*530.964*	*100.00*	*21,000*	*37,000*	*204,000*	*408,000*	*670,000*

A – Panel membership.
B – Percentage of payments for annual membership and panel membership (G + H).
C – 1981 catch (live weight).
D – 1981 canned production (net product weight).
E – Total (C + D).
F – Percentage distribution of F.
G – Payment of $1,000 annual membership contribution.
H – Payment of $1,000 for each panel membership.
I – 1/3 of $612,000 = ($670,000 - $58,000 (G + H)) distributed percentage-wise according to column B.
J – 2/3 of $612,000 = ($670,000 - $58,000 (G + H)) distributed percentage-wise according to column F.
K – Total (G + H + I + J).

Appendix 4 to Annex 9

TABLE PRESENTED BY THE SPANISH DELEGATION ON THE CURRENT STATE OF THE WORKING CAPITAL FUND

All the figures shown in this table were taken from document COM/83/11 (Financial Report, 1983) and are as of September 30, 1983.

Working Capital Fund *(Statement 8)*	$ 918,548	
Expenses pending up to end of 1983 for Regular Budget *(Statement 4)*	- 192,165	
		726,383
Expenses pending up to end of 1983 for Skipjack Budget *(Statement 7)*		- 82,000
		644,383
Contributions pending payment in October, 1983, for Regular Budget *(Statement 3)*	+ 313,333	
Contributions pending payment in October, 1983, for Skipjack Budget *(Statement 6)*	+ 15,318	
		+ 328,651
Balance in the Working Capital Fund at end of 1983		$ 973,034

Annex 10

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

Madrid, Spain, November 3 - 7, 1983

Table of Contents

Item 1. OPENING OF THE MEETING

The Standing Committee on Research and Statistics (SCRS) met in Madrid at the Hotel Princesa Plaza on November 3-7, 1983, under the chairmanship of Mr. J. S. Beckett (Canada). Groups of scientists met during the preceding three days to help rapporteurs draft the species sections of the SCRS Report.

The SCRS Chairman opened the Fourteenth Regular Meeting of the Committee and welcomed all the scientific delegations, particularly Uruguay, the newest ICCAT member country attending this session.

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

Item 2. ADOPTION OF AGENDA AND ARRANGEMENTS FOR THE MEETING

The Tentative Agenda which was circulated prior to the Meeting was adopted (attached as Appendix 1). The following scientists were nominated rapporteurs for the 1983 session:

TROPICAL TUNAS	A. Fonteneau (General rapporteur)
Yellowfin	F. X. Bard
Bigeye	S. Kume
Skipjack	N. Bartoo
ALBACORE	A. González-Garcés
BLUEFIN	H. Farrugio
BILLFISH	R. Conser
SWORDFISH	J. C. Rey
SOUTHERN BLUEFIN	S. Kume
SMALL TUNAS	J. P. Wise
MULTI-SPECIES INTERACTIONS	
(Tropical)	P. Kleiber
(Temperate)	G. T. Sakagawa
OTHER AGENDA ITEMS	P. M. Miyake

Noting that Mr. Z. Suzuki, the Convener of the Sub-Committee on Statistics was not present at this Meeting, the SCRS Chairman nominated Dr. G. T. Sakagawa as Convener of the Sub-Committee for this session. Besides the meeting of the Sub-Committee on Statistics, Mr. Beckett noted that the Sub-Committee on Skipjack and the Working Group on Juvenile Tropical Tunas would be holding their meetings during this session. He asked the Convener of the Working Group on Juvenile Bluefin to decide whether or not a meeting of this Group would be held during the current session. A meeting of the Working Group on the Eco-biological Aspects of Tunas was postponed until the SCRS decides whether a mini symposium would be held at the 1984 session of the SCRS.

Item 3. ADMISSION OF OBSERVERS

The observers (see List of Participants) were introduced, admitted and welcomed to the 1983 SCRS Meeting.

Item 4. ADMISSION OF SCIENTIFIC PAPERS

The SCRS was informed that this year all documents were submitted before the deadline, accompanied by 80 copies as requested. All the documents were admitted (the List of Documents is attached as Appendix 2). The Chairman hoped that this affirmative procedure would be followed again next year. He also encouraged the scientists to submit papers early and to send a copy to the species rapporteurs.

Item 5. REVIEW OF NATIONAL FISHERIES AND RESEARCH PROGRAMS

5.1 ANGOLA

Angolan catches for 1982 were very similar to those of 1981. A total of 4,643 MT was reached and can be broken down as follows: 37 percent skipjack, 30 percent yellowfin, 24 percent Atlantic little tuna, and 9 percent other species.

In 1983, the total estimated catch data were obtained during landings.

An effort was made to continue the port sampling activities on the most abundant species.

Presently, the Angolan Government is investigating possible bilateral agreements with foreign tuna companies to promote a joint exploitation of tuna in its exclusive economic zone.

5.2 BENIN

No report was submitted.

5.3 BRAZIL

No report was submitted.

5.4 CANADA

In 1982, 554 MT of swordfish were taken, of which 542 MT were taken by longline and 12 MT were taken in the harpoon fishery. A total of 291 MT of bluefin tuna were taken in 1982, of which 68 MT were taken by trapnet, 213 MT were taken by handgear ("tended line" and rod and reel), and 10 MT were caught incidentally. There was no Canadian purse seine fishery in 1982.

An ageing validation study on swordfish was continued in 1982 comparing ages determined from otoliths, finspines and vertebrae. Intensive port sampling of bluefin tuna was conducted on Prince Edward Island and at St. Margaret's Bay, Nova Scotia. Logbooks were collected from most of the bluefin handgear fishermen. There were no tuna tagged or recaptured in 1982.

There was a decrease in effort for swordfish in 1983 and the total catch is not expected to exceed 500 MT. The Canadian quota for bluefin tuna was increased from 250 to 573 MT. Effort did not increase and the bluefin fishery was managed by subarea quotas. The trapnet fishery was nearly a complete failure. There was no purse seine fishery and no tuna or swordfish were tagged.

5.5 CAPE VERDE

Cape Verde fishing operations all take place around the islands. An experimental fishery was developed in Sao Tomé and another in Azores.

As of September, 1983, the active Atlantic fleet was comprised of three freezer

baitboats and 18 baitboats without freezer facilities. Some 40 small boats using pole-and-line supply a small canning factory.

Through an agreement with the Spanish Government, seven Spanish baitboats were fishing in the Cape Verde Exclusive Economic Zone (EEZ). In order to test other gears, a Portuguese purse seine operation was authorized. As regards statistics, Cape Verde has complied with ICCAT requests to submit catch and effort data and biological sampling by 5° squares.

5.6 CUBA

Tuna landings by the Cuban tuna fleet in 1982 were very similar to those of previous years. Longline is the principal gear used by wide-range vessels operating in the east-central Atlantic and accounted for 70 percent of the total catch. The pole-and-line is the second most important gear (21 percent of the catches) and is used in adjacent Cuban waters.

The total Cuban catch in 1982 (8,595 MT) was lower than in 1981 and 1980 (9,700 and 11,800 MT, respectively). This is due to the decrease of yellowfin catches which also explains the longline catches of this species.

The tuna fleet was comprised of 23 large longliners, 2 medium longliners, about 60 small longliners and trollers, 67 small and medium vessels using pole-and-line and one large purse seiner.

In 1982 and 1983 size sampling of skipjack and blackfin continued. Cuba contributed to activities of the Skipjack Year Program and exploratory fishing was carried out using medium longliners and a medium purse seiner. In addition, more accurate statistics were presented to ICCAT in 1982 and the species breakdown was improved in 1982.

5.7 FRANCE

In 1982, French catches were about 66,900 MT comprised of 29,200 MT yellowfin, 26,100 MT skipjack, 5,000 MT bluefin, 3,600 MT albacore and 3,000 MT bigeye.

Research conducted by CNEXO/COB, ISTPM, and ORSTOM included searching for new albacore fishing areas, collection of albacore biometric data, studies on environmental conditions and tests of partial freezing. Age composition of albacore catches and CPUE were studied. Studies were made on bluefin tuna catches and their age composition in the Mediterranean. For tropical tunas, data for the FISM fleet were processed. Research was centered on yellowfin and skipjack. The latter species was the subject of the Conference during which the various studies carried out this year, in the context of the Skipjack Program, were presented.

5.8 GABON

No report was submitted.

5.9 GHANA

No report was submitted.

5.10 IVORY COAST

The Ivory Coast fleet was comprised of 8 purse seiners which operated in the eastern tropical Atlantic. Tuna catches in 1982 were 17,620 MT which is similar to 1981 levels (17,560 MT). However, the preliminary estimate for 1983 shows a decrease of about 20 percent, in spite of constant fishing effort. The catches were made up mainly of yellowfin (50 percent) and skipjack (47 percent).

The total landings and transshipments of tuna at Abidjan amounted to 145,000 MT in 1982, which made statistical data collection more difficult. However, in spite of the difficulties, data coverage was still very satisfactory, 80 to 100 percent for Task I and II data, depending on the fleet; about 75,000 fish were measured.

The CRO-Abidjan actively participated in the Skipjack Program activities (tagging and processing of skipjack data). Scientists from the CRO presented six documents at the Skipjack Conference in Tenerife.

5.11 JAPAN

The Japanese tuna fishery produced approximately 57,000 MT of tuna and tuna-like fishes in 1982 in the Atlantic, which was slightly higher than that of the preceding year. The longline fleet, spreading over a wide area of the Atlantic, caught about 44,000 MT representing an increase of 20 percent compared to 1981. Due to a decrease in fleet size, the 1982 tropical tuna catch by Tema-based baitboats showed a significant decrease from 16,178 MT to 10,620 MT in 1981. One purse seiner took 2,250 MT of tropical tunas in 1982. All the fleets have been under national measures to comply with ICCAT regulations on yellowfin, bigeye and bluefin tunas.

The fisheries data on Atlantic tunas and tuna-like fishes are collected and compiled by the Far Seas Fisheries Research Laboratory (FSFRL) and are submitted to the ICCAT Secretariat as requested by the SCRS. Seven documents containing scientific findings on fishery biology and stock assessment analyses were presented to the 1983 SCRS. A scientist representing the FSFRL submitted three research documents to the Skipjack Conference held in Tenerife in June, 1983. FSFRL scientists also participated in the Preparatory Meeting on Atlantic bluefin tuna held in Trapani, Italy, in May and the Bluefin Workshop hosted by Japan in September, 1983.

5.12 KOREA

In 1982, Korean catches of Atlantic tunas and tuna-like species were about 24,500 MT, which represent a decrease of 23 percent from the 1981 catch of 31,800 MT.

Fifty-two longliners operated in the Atlantic and caught about 21,000 MT, a 6 percent decrease; four baitboats yielded about 3,500 MT, a 63 percent decrease compared to the previous year's catch. A considerable decrease in the baitboat fishery (58.1 percent for skipjack and 97.7 percent for yellowfin) is attributed to the decrease in the number of fishing vessels. Until May, 1983, two baitboats operated and thereafter no baitboats fished in the Gulf of Guinea.

Research activities were carried out by the Fisheries Research and Development Agency in association with Korean fishermen as in past years. The catch and effort and bio-

logical data were collected from the fishing vessels, and for the Skipjack Program, tagging activities and intensive sampling were also performed in the Gulf of Guinea.

5.13 MOROCCO

No report was submitted.

5.14 PORTUGAL

In 1982, Portuguese catches of tuna and tuna-like fishes totaled 8,865 MT. This catch is broken down as follows:

a) by species – 5,531 MT skipjack, 1,859 MT bigeye, 981.5 MT yellowfin, 322 MT albacore, 40.5 MT bluefin, 10 MT swordfish, and 121 MT Atlantic bonito and other species;

b) by administrative regions – 1,888 MT mainland, 5,979 MT Azores, and 998 MT Madeira.

In 1982, the artisanal boats and two purse seiners registered in the ports of continental Portugal (mainland) captured 1,888 MT (119.5 MT were captured in Iberian waters; 868.5 MT were captured in Gulf of Guinea waters, and 900 MT were captured in other eastern Atlantic waters).

These 1,888 MT of tunas and tuna-like fishes included 948.5 MT yellowfin, 779 MT skipjack, 10.5 MT bluefin, 24 MT bigeye, 16 MT albacore, and 110 MT Atlantic bonito and other species.

A total of 5,979 MT of tunas were taken in 1982 by Azores including 1,129 MT bigeye, 4,599 MT skipjack, 188 MT albacore, 18 MT yellowfin, 30 MT bluefin, 4 MT swordfish, and 11 MT other species.

Madeira's catches in 1982 totaled 998 MT, of which 706 MT were bigeye, 153 MT skipjack, 118 MT albacore, 15 MT yellowfin and 6 MT swordfish.

For the current year (1983) estimates for Azores and Madeira indicate that the total catch is at the same level as in 1982 with a marked increase in bigeye and yellowfin catches and a significant (80 percent) decline in skipjack catches.

During this year 2,820 MT bigeye, 880 MT skipjack, and 1,650 MT albacore were taken in the Azores.

5.15 SAO TOME AND PRINCIPE

No report was submitted.

5.16 SENEGAL

In 1982, the tuna fleet based at Dakar (24 baitboats and 5 purse seiners) landed a total of 12,350 MT, of which 50 percent was skipjack. These landings are 20 percent higher than in 1981, due to good skipjack catches. Tuna landings and transshipments by the Senegalese fleet are estimated at about 30,000 MT for 1982. Catches in 1983 for the three species of tropical tuna will be particularly low (40 percent less than in 1981 as of August 31, 1983).

Landings of small tunas (4,600 MT) comprised essentially of Atlantic little tuna, increased by almost 36 percent in 1982. Sailfish catches (640 MT) were made mainly by the artisanal fishery, an increase of 21 percent. In 1983, a new swordfish fishery, comprised of two Spanish longliners, was based in Senegal.

Research activities in Senegal centered as usual on the processing of data collected by the FISM fleet.

A special research effort was made for the Skipjack Program with the organization of a successful skipjack working meeting in March, 1983, in which ten countries and ICCAT participated. Ten documents were prepared in Senegal concerning the Skipjack Program. These documents discussed the research carried out for the Skipjack Program, such as studies on skipjack biology, statistics, age structure, etc. These documents demonstrate the important research and the quality of work carried out in Senegal.

5.17 SOUTH AFRICA

No report was submitted.

5.18 SPAIN

Spanish catches of tunas and tuna-like species rose in 1982 to 141,342 MT, the highest Spanish catch on record up to now. These catches represent an increase of approximately 6,000 MT over 1981. This is mainly due to the tropical fleet catches. Although yellowfin catches have decreased slightly, skipjack catches increased considerably by about 7,000 MT. Canary Islands catches decreased overall by about 2,000 MT due to the decrease in catches for almost all species. Peninsular catches increased by about 5,300 MT caused mainly by an increase in albacore and swordfish production.

Spanish catches, in order of importance of the species, were as follows: yellowfin (48,636 MT), skipjack (44,466 MT), albacore (26,156 MT), bigeye (8,410 MT), swordfish (5,454 MT), and bluefin (3,813 MT); catches of other species totaled 4,407 MT.

Research was centered on carrying out ICCAT SCRS work. Considerable attention was given to skipjack research such as processing of skipjack data and development of biological parameters. The data obtained were presented to the Skipjack Conference which took place in Santa Cruz de Tenerife, Spain, in June, 1983. As regards bluefin, studies were made on the possible interchange between the eastern and western stocks, through collection and analysis of bluefin parasites. Bluefin catch-by-size data for all the Spanish fisheries from 1950 to 1982 were completed and presented at the Bluefin Preparatory Meeting in Trapani (Italy) and the Bluefin Workshop in Japan. Besides, new size-weight

and size-age relationships were developed for bluefin in the eastern Atlantic and Mediterranean.

During 1982 and 1983 two bluefin tagging cruises, two skipjack tagging cruises, one swordfish cruise and one albacore tagging cruise were carried out. Collection of biological data from all Spanish fleets continued as usual in 1982 and in 1983.

5.19 URUGUAY

Atlantic longline catches by Uruguay in 1982 totaled 1,663 MT broken down as follows:

Swordfish	663 MT
Bigeye	463 MT
Albacore	260 MT
Yellowfin	253 MT
Tuna	3 MT
Billfishes	5 MT
Others	16 MT
Total	1,663 MT

Statistics on catches were compiled using records abstracted from the fishing vessel logbooks. Since the second quarter of 1983, sampling of the national fleet landings has been carried out. The "Instituto Nacional de Pesca" is the organization that gathered the statistics and conducted the sampling from national flag vessels.

5.20 U.S.A.

In 1982, the United States catch of Atlantic tunas and tuna-like species totaled approximately 15,000 MT. This total is approximately 16 percent lower than the 1981 catch of 18,000 MT.

In 1982, tropical tuna catches totaled approximately 2,000 MT, down sharply from 7,300 MT in 1981. Bluefin tuna catches were limited to 684 MT in 1982, approximately one half of the 1981 catch. Catches of swordfish rose in 1982 to 3,700 MT from 2,700 MT in 1981.

Both the United States tropical tuna and bluefin tuna fleets operated under regulations in 1982. The tropical tuna fleet was subjected to 3.2 kg minimum size limits for yellowfin and bigeye tunas. The bluefin tuna fishery was subjected to a minimum size limit and catch limitations.

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

5.21 U.S.S.R.

In 1982, the U.S.S.R. tuna catch amounted to 18,728 MT, including 5,623 MT frigate tuna, 3,957 MT skipjack, 1,085 MT little tuna, 1,004 MT yellowfin, 635 MT bigeye, 95 MT swordfish and 6,329 MT bonito. Catches in the first two quarters of 1983 amounted to 5,149 MT. Tunas and swordfish were caught in the east equatorial Atlantic by longline, purse seine and suface fishing gears. Purse seine catches increased with respect to 1982, whereas longline catches decreased.

Scientific research was carried out on the age structure of the skipjack population, yellowfin and skipjack reproductive biology, yellowfin size composition, as well as an analysis of the distribution of the tuna species, taking into account variability factors in the hydrophysical field.

5.22 CHINA (TAIWAN)

The total landings made by Taiwanese longliners in 1982 was 38,800 MT, which is approximately 30 percent more than the 1981 landings of 29,800 MT. Eighty-five percent of the total landings (33,300 MT) was albacore, of which 10,500 MT were from the North Atlantic and 22,800 MT from the South Atlantic. A total of 213 boats operated in 1982; in 1981, 190 boats operated.

Collection and compilation of catch and effort statistics continued in 1982. The coverage rate of logbooks improved slightly from 79 percent in 1981 to 81 percent in 1982.

Size measurements on board also continued. In 1982, 133,000 albacore were measured. Also, 4,000 bigeye, 800 yellowfin, 500 swordfish, and 200 white marlin were measured. These size data have been compiled by ICCAT large areas and were reported to the SCRS.

Standardized total longline effort on albacore was updated to 1982. Based on this, fishing intensity and CPUE of the albacore longline fishery were analyzed. An evaluation of the South Atlantic albacore stock was made. The results of these studies were summarized in three working papers and were presented to the SCRS.

As for an estimate of this year's fishing, the number of Taiwanese boats fishing in the Atlantic decreased significantly from last year (from 213 to 104 vessels). Based on the first six months' landing statistics, this year's total landings will be around 28,000 MT, which means a reduction of about 28 percent.

Item 6. REVIEW OF CONDITIONS OF STOCKS, WITH BRIEF PRESENTATION OF MAJOR PAPERS ON THIS SUBJECT

YFT–YELLOWFIN

YFT-1 Description of fisheries

Yellowfin are fished throughout the tropical Atlantic by surface gears (seiners and baitboats) and by longline. Figure 1 shows the increasing domination of the fishery by the surface gears. The precise division of the catches by gear and country is shown in Table 1.

Catches increased steadily until about 1975, then stabilized until 1980 at a level of about 120,000-130,000 MT. In 1981, there was a record catch of 143,600 MT; since then catches have decreased.

The greater part of the catch in the eastern Atlantic is taken by surface gears, particularly by seiners. In the western Atlantic, the dominance of longline fishing was offset by an increase in surface gear.

The carrying capacity of the surface tuna boats is a simple measure of the nominal fishing effort exerted on yellowfin. This index was completely recalculated for the eastern Atlantic for the present meeting (Table 2 and Figure 2). A continuing increase in this index is evident. The growth of the effective effort on yellowfin as calculated on the basis of the CPUE of the FISM fleet is remarkably similar.

YFT-2 State of the stocks

There has been no new information to permit improvement of knowledge of stock structure. Two hypotheses have been regularly used: that of two stocks, one in the eastern Atlantic and one in the western Atlantic, separated at around 30°W, and that of a single Atlantic stock. It should be kept in mind that, because of the magnitude of the catches in the eastern Atlantic, most of the data and conclusions concern the eastern Atlantic stock.

YFT-2.1 Eastern Atlantic

Three indices were studied which indicate the changes in abundance in the eastern Atlantic stock (Figure 3). The first is based on the CPUE of the FISM fleet, while the other two are indices of the biomass estimated with two different hypothetical exploitation rates of the stock.

All three indices show a continuous decline from 1969 through 1982. The biomass curve under the hypothesis of a fully exploited stock (F-max) is apparently closer to the index derived from the FISM CPUE. However, the FISM CPUE showed a more marked decline than the biomasses calculated from cohort analysis under either hypothesis.

Examination of the production model (Figure 4) shows that in spite of the marked increase in effective fishing effort since 1976, the catches have increased only slightly until 1981 and decreased in 1982-83. The curves can be fitted with different m and k

values. The m value is responsible for defining the shape of the curves and k represents the number of age-classes that contribute significantly to the catches.

The curves fitted for different values of k (3 and 5) and m (1 and 2) give MSY's varying from 107,000 to 114,000 MT. The best fit is with an m of about 2, and estimates an MSY of 112,800 MT which must be compared to the average catches of 1981-1982 (120,000 MT). If the model with m = 2 corresponds to the fishery, a decrease in catch will be expected when the stock reaches equilibrium at current effort levels. In fact, it appears that the present fishing effort is above the effort levels corresponding to these MSY's which are 57,000 to 79,800 fishing days. The average effort of 1981-1982 is 82,100 fishing days. However, the uncertainty about the effort levels corresponding to the MSY is greater than the uncertainty about the MSY. Nonetheless, it is possible that the current fishing effort level may be close to the upper limit of the uncertain range of effort corresponding to the MSY.

It should be taken into account that all these considerations based on production models are only valid for the current exploitation pattern. Finally, this present analysis eliminated some doubts, which were referred to last year, with respect to the reality of the steady increase in fishing effort since 1981.

An analytical study of the current yield-per-recruit has been made for the eastern stock under the two hypotheses: F-min (low exploitation rate) and F-max (high exploitation rate) as mentioned before. The real fishing mortality values should lie between these two values. Comparison of other available information, such as the change in the abundance index derived from the CPUE and the biomass, or the similar change in fishing effort and fishing mortality, suggests that the current situation is close to the F-max hypothesis since the stock is being heavily exploited at present. However, the current analysis is valid only if the current recruitment is fluctuating without trend, as is suggested by the variations in the CPUE of young yellowfin.

Yield-per-recruit analysis shows this heavy exploitation for 1982, as can be seen in Figure 5. This figure also shows the situation before 1969, which is characterized by a low exploitation rate, as well as the curve of optimum production in case fishing effort increased. Figure 6 shows possible increases in production which may result from a simple increase in age-at-first-capture under the 1969 and 1982 fishing effort patterns. It is noted that in the current situation, an increase in production may be expected from effective regulation on age-at-first-capture.

For the first time, a figure was drawn to present the relationship between the spawning biomass and recruitment for 1969 to 1981 (Figure 7). It appears that recruitment has heavily fluctuated but without a decreasing trend during these years. On the other hand, the fecundity level in 1981 does not seem to have reached dangerously low values. Finally, it should be noted that the fitted curve has only a very low prediction value due to the dispersion of points.

However, the stock conditions may be adversely affected because when fishing effort is higher, the size of old age-classes in that population has to decrease. Consequently, significant catches are made from fewer age-classes. For this reason, the effect of apparent variability of recruitment (1 to 7) in this stock could have a serious negative impact on the catch and the CPUE when the recruitment is low.

YFT-2.2 West Atlantic stock

As in the past, it is impossible to draw any conclusions on the state of the western stock due to the lack of updated studies. However, the rapid increase of catches recorded in the west Atlantic seems to indicate significant potential.

YFT-2.3 Total Atlantic stock

A production model analysis of Atlantic-wide catches (Figure 8) shows that the total production remains constant in spite of a significant increase in fishing effort. For 1981-1982, the production was 140,000 MT. The MSY's were estimated to be between 118,000 and 131,000 MT. The fishing effort level which would maintain these MSY's is estimated to be 65,000-87,000 fishing days. The current effort for 1981-1982 is 97,150 fishing days. The total Atlantic stock seems to be exploited at a fishing effort level which is beyond that corresponding to the MSY.

However, when assessing the yellowfin population on an ocean-wide basis, it should be recognized that total catches are dominated to a large degree by catch in the east Atlantic. Therefore, the results are truly representative of the whole Atlantic only if there is a high enough exchange of fish so that population trends on one side are reflected by similar population trends on the other side. Consequently, until such a high rate of exchange is demonstrated, the conclusions of an Atlantic-wide production model analysis must be viewed with caution.

YFT-3 Effects of current regulations

Due to mixing with skipjack in schools, young yellowfin under the 3.2 kg size limit are caught in large numbers in the Gulf of Guinea. The proportion of such undersized fish in recent yellowfin catches is extremely high in the eastern Atlantic. In 1982, the percentage in number of fish is about 68 percent for baitboat catches, 57 percent for purse seine catches and about 59 percent for total catches. Judging from these figures, the regulation limiting catches of small yellowfin has, at present, no effect on the principal fleets operating in the eastern Atlantic. This deficiency should be compared with the substantial gains to be expected from such a regulation in the current exploitation of the eastern stock (Figure 6).

YFT-4 Recommendations

YFT-4.a Statistics

The current level of yellowfin statistics is satisfactory for most of the fisheries. However, several tasks should be carried out:

i) An improvement in Task I and II catch and effort and size composition data from the fisheries in the western Atlantic.

ii) An accurate estimate of the quantities of young yellowfin and bigeye less than 3 kg that are sold as skipjack in African ports. This recommendation is a very important task for the Working Group on Juvenile Tropical Tunas.

iii) Documentation of a system for collecting Task I, II and size composition statistics for the international fleet based at Tema.

iv) Due to the development of a fishing technique of deep longline, it would be useful to report Task II data separately for the classic and deep longlines.

YFT-4.b Research

The Committee recommended that an analysis on the state of the western yellowfin stock be presented.

The Committee also recommended that research be conducted to improve reliability of the MSY, effort and production gains predicted by the models.

It also recommended that catch-by-age tables be improved, either from direct age determinations from hard parts of adult fish, or by new techniques in the analysis of size distributions.

Finally, it would be useful to compare changes in environmental conditions in the tropical Atlantic with annual variations in yellowfin abundance indices.

YFT-4.c Management

The Committee has no new management recommendations at this time. However, the Committee is concerned that in the eastern Atlantic, effective fishing effort appears to be in excess of that needed to maintain current estimates of MSY. Also, large amounts of juvenile fish are being caught, reducing the potential maximum yield from the stock. Should these trends continue, it may be necessary for the Commission to consider more stringent regulations.

The Committee noted that the results of the Working Group on Juvenile Tropical Tunas, which is to complete its work in 1984, should provide information on which the Commission might base a decision on further management measures.

BET–BIGEYE

BET-1 Description of fisheries

Bigeye tuna are distributed widely in the temperate and tropical waters of the Atlantic between 40°N and 40°S. The spawners and juveniles inhabit the equatorial area and the fish at late juvenile and post-reproduction feeding stages migrate into the temperate waters north of 20°N or south of 20°S. The longline fishery is spread over almost the entire bigeye habitat. Presently, the local baitboat fisheries seasonally catch bigeye in waters off Azores, Madeira, the Canary Islands and off Dakar. Bigeye are caught incidentally mixed with yellowfin and skipjack by the Tema-based baitboat fleet and the tropical purse seine fleets.

The historical catches by gear and country are given in Table 3. The longline fishery has been taking the largest share of the catch in past years (Figure 9). Following the ini-

tiation of longline fishing, the total Atlantic catch increased gradually to 60,000 MT in 1974, and since then has fluctuated between 38,800 MT in 1976 and 58,800 MT in 1980. The preliminary 1982 catch is 61,600 MT. The increase in catch in 1980-1982 was due to the increased catch by the longline fishery.

BET-2 State of the stocks

Whether or not Atlantic bigeye comprise a single stock is still uncertain, and the Committee assessed the state of the stock(s) under two hypotheses of stock structure: (1) a single Atlantic-wide stock, and (2) separate stocks in the North and south Atlantic. Examination of adjusted CPUE of the longline fishery indicates that the recent level of relative abundance of adult stock is apparently close to one half the level at the initial exploitation period, whichever stock structure hypothesis is considered (Figure 10). The Committee also used production models to evaluate the status of the stock for Atlantic bigeye (Table 4). The highest values of the MSY are estimated with $m = 0$ and infinite effort, and this unlikely situation corresponds to the theoretical upper limit of the MSY. The conclusions from the production model analyses are essentially the same as the results reported last year, under both hypotheses of stock structure.

BET-2.1 Total Atlantic stock

The total Atlantic stock appraisal made by production model analysis suggests that the stock is currently exploited at a high level close to the lower estimates of MSY. The MSY was estimated at between 53,700-114,200 MT, depending on the form of the curves (Figure 11). Consequently, increasing fishing effort would probably not result in a substantial increase in yield given the current operating pattern of the fishery.

The previous examination by the Committee of the effect of certain time and area closures for the bigeye fishery indicated that under various assumptions reduction of the catch of juvenile bigeye tuna would result in a minor gain in overall yield-per-recruit (1976-78) of up to 10 percent in the following 3 to 7 years. The overall gain would be distributed among the longline and baitboat fisheries that take large fish. These calculations were based on data for the fishery up to 1979 and should be verified using the most recent data.

BET-2.2 North Atlantic stock

The updated production model analysis for the north stock resulted in MSY estimates in the range of 32,900-74,100 MT, (1981 catch 31,300 MT) depending on the parameters of the model (Figure 12). These are unchanged from last year's estimates. If the North Atlantic bigeye tuna comprise a unit stock, an increase in the sustainable catch would be expected by an increase in effort given the current fishery pattern, though the gain would be marginal.

BET-2.3 South Atlantic stock

For the south Atlantic stock, the production model fitted to updated catch and

effort data produced MSY estimates of 23,700-49,200 MT, depending on the parameters of the model used (Figure 13). The bigeye fishery (28,600 MT in 1981) has been recently operating around the estimated MSY level. The observed catch and effort in 1980 and 1981 were above the lower limit of the range of estimated MSY. A further increase in effort from the present level would not likely be accompanied by an increase in sustainable yield.

BET-3 Effects of current regulations

In September, 1980, a minimum size regulation of 3.2 kg for bigeye tuna was put into effect by the Commission for three years and was subsequently extended until the end of 1984. Size composition sampling of some components of the 1982 catches from the eastern Atlantic revealed that bigeye tuna less than 3.2 kg comprised at least 56 percent by number of the purse seine catch and 48 percent by number of the baitboat catch (or 56 percent overall). Size samples were not reported for several fleets. It is noted that the 3.2 kg size limit regulation has not been effective for the surface fleet in the eastern Atlantic.

It is expected that the intersessional meeting of the Working Group on Juvenile Tropical Tunas, scheduled for 1984, would give further insight on this subject.

BET-4 Recommendations

BET-4.a Statistics

The Committee recommended that:

i) The amount of bigeye tuna included in the FISM and Spanish tropical nominal yellowfin catch and Tema-based tuna catches be more accurately estimated.

ii) The Working Group on Juvenile Tropical Tunas develop estimates of the quantities of bigeye and yellowfin of less than 3 kg that are sold as skipjack. This refers particularly to catches by the Tema-based and FISM fleets but also to a minor extent to the Spanish fleet.

iii) Size sampling at transshipment sites in Puerto Rico be continued.

iv) Detailed data on deep longlining sets be compiled to examine the difference of gear efficiency within the fishery.

BET-4.b Research

The Committee recommended that:

i) Data on bigeye tuna collected during the International Skipjack Year Program be examined.

ii) Uncertainty about the stock structure be re-examined based on all available biological information such as maturity and updated tag release-recapture data.

iii) An index of abundance that incorporates information from the surface bigeye tuna fisheries be developed.

iv) Age-structure stock analysis, such as cohort and yield-per-recruit analyses, be continued, based on improved catch-at-age table.

v) Research on alternative management strategies be carried out to evaluate the effects of catches of small bigeye tuna on the yield-per-recruit.

BET-4.c Management

The Committee has no specific recommendations for additional management measures, although it would draw attention to the fact that current landings are close to or above the lower limits of the range of MSY's, as currently estimated, and hence, increased effort is unlikely to generate increases in sustainable yield. Measures to increase yield-per-recruit could increase the estimates of MSY and the Working Group on Juvenile Tropical Tunas will provide information on the significance of the catch of bigeye less than 3.2 kg in this regard.

SKJ–SKIPJACK

SKJ-1 Description of fisheries

Skipjack are fished Atlantic-wide with a majority of the catch taken east of 30°W. Catches of skipjack tuna by gear and country for both east and west Atlantic are shown in Table 5. Since 1969, the general trend in Atlantic-wide skipjack catches has been upward, although irregular, with surface gears accounting for almost all catches. Total catches moved upward from about 30,000 MT in 1969 to 118,800 MT in 1974. Lower catches of 62,000 MT and 77,000 MT were recorded in 1975 and 1976. In 1977, the catches rose to 118,000 MT and have remained high since, with record catches of 140,000 MT and 150,000 MT being made in 1981 and 1982. Preliminary estimates place the 1983 catch about 10-20 percent lower than the 1982 catch, in the 130,000 MT to 140,000 MT range.

Catches of skipjack tuna from the east Atlantic from 1968 to 1978 ranged from 28,000 MT to 114,000 MT and are only a few tons less than the total Atlantic catch. From 1978 through 1982 eastern Atlantic skipjack catches remained high, reaching peak catches of 116,000 MT and 117,000 MT in 1981 and 1982, respectively.

Skipjack tuna catches from the west Atlantic amounted to only a few tons from 1968 through 1977. Beginning in 1978, west Atlantic skipjack catches increased to about 6,000 MT. In 1980, catches rose to 13,000 MT. The increase in catch continued with 23,000 MT and 32,000 MT taken in 1981 and 1982. The increase in 1980-1982 was due primarily to the developing Brazilian baitboat fishery.

Fishing effort measures are inadequate or unproven for the eastern Atlantic fishery and non-existent for the western fishery. Figure 14 shows carrying capacity and effective skipjack effort as the two best measures of fishing effort. Both indices show a steady increase in fishing effort, increasing nearly four-fold since 1969.

SKJ-2 State of the stocks

The International Skipjack Year Program (ISYP) has provided numerous data and analyses which have improved our understanding and assessment of the skipjack stocks in the Atlantic. Results of tagging have not yet confirmed the stock structure of Atlantic skipjack. However, for assessment and management it appears that the east and west Atlantic fisheries can be considered as management units.

Catch-per-unit effort (CPUE) for the east Atlantic as measured by purse seiners fishing throughout the Atlantic, are considered the best measure of eastern Atlantic skipjack CPUE. As concluded by the Report of the ISYP the CPUE's of purse seiners show a slight decrease since the mid-1970's. This trend was supported by a CPUE series for the FIS purse seine fleet (Figure 15) which showed high variability in CPUE based on 15-day periods from 1969-1982.

Based on tagging data from the ISYP and additional analysis, it appears that the skipjack population in the Gulf of Guinea in the eastern tropical Atlantic shows a rather high instantaneous rate of attrition from the population (all causes) of .20 - .40 per month. This rate appears higher for waters off Senegal and Cape Verde and may be due to fish migration. The instantaneous rate of fishing mortality is low to moderate: .019 - .045 per month. This leads to a low exploitation rate, the ratio of fishing mortality to total attrition of .068 - .21.

No production model was presented to the Committee. However, the Committee examined production model results presented to the ISYP Conference. Even though CPUE does not appear to index abundance very well and only qualitative information is useful, i.e., no reliable estimates of MSY can be taken from the analysis, it appears that the fishery is below MSY and could absorb additional effort.

The ISYP Report concluded that skipjack are characterized by fast growth, high fecundity, and early maturation. In addition, they are most vulnerable to fishing gears only for one or two years during their life. Tagging experiments showed a rapid reduction of tag recovery rates with time, in the eastern tropical fishery, and the scarcity of large-sized (over 55 cm long) fish. This suggests rapid loss of fish to attrition. Given this situation, it seems that catching as many skipjack as possible before they become unavailable to the fishery will produce a better yield.

No direct measurement of recruitment was made during the ISYP, although some information collected by the ISYP gives a better understanding of recruitment trends for Atlantic skipjack tuna. Results of analysis of tagging data, catches and reproduction show that skipjack move over long distances, spawn year-round over a large area and are recruited at 35-55 cm fork length, year-round in the eastern Atlantic fishery. Overall spawning and recruitment, therefore, could be at least partially independent of local environmental conditons. Some evidence suggested that recruitment to the eastern Atlantic fishery was relatively stable over the years 1968-1980, during a time when fishing effort and catch increased greatly. This relatively stable pattern of recruitment and CPUE declining only slightly, as a function of increasing fishing effort, indicates that the eastern fishery is having minimal, if any, effect on recruitment to the population.

In conclusion, the Committee's opinion is that the skipjack stocks in the Atlantic are under-exploited and can withstand additional fishing pressure which will produce additional yield.

SKJ-3 Effects of current regulations

No regulations are currently in force for skipjack. Regulations protecting small yellowfin and bigeye may be unintentionally affecting the skipjack fishery, at least partially. The SCRS Working Group on Juvenile Tropical Tunas will meet in mid-1984 to evaluate the extent of the interaction between species.

SKJ-4 Recommendations

An extensive and detailed set of recommendations on statistics and research arose from the ISYP Conference. These are summarized here.

SKJ-4.a Statistics

i) Catch statistics should be improved. Examples include total catch from the Caribbean and landings at Tema.

ii) Data on fishing effort need to be gathered and improved. In the west Atlantic almost no effort data are available. In the east Atlantic improved measures of effort should be pursued.

iii) Biological sampling from Caribbean catches needs to be conducted.

iv) Comparisons of observer and port sampling data should be done to detect biases in sampling.

SKJ-4.b Research

i) CPUE indices relating fishing power of various gears and fleets should be developed or improved.

ii) Additional research on maturity, fecundity and spawning should be developed for expanded areas which have not yet been studied.

iii) Growth studies should be done for fish from various regions (e.g., parts of the western Atlantic or off Angola) and time periods both in the east and west Atlantic.

iv) Studies of predation and distribution of young as well as studies of factors affecting survival of recruits should be made.

v) Investigations on relation of environmental factors to skipjack abundance and recruitment should be conducted.

vi) More tagging experiments are needed to define stock structure. Evaluations of past tagging efforts and the resulting conclusions should be used when designing new studies.

vii) Estimates of fishing mortality (F) should be done using different methods including size structured models.

SKJ-4.c Management

There are no management measures needed or recommended for Atlantic skipjack stocks. All indications are that catches can be increased. It should be noted that increased effort on skipjack tuna may conflict with management measures currently in place for other species.

ALB–ALBACORE

ALB-1 Description of fisheries

It is well accepted that the Atlantic albacore population is comprised primarily of a North Atlantic stock and a south Atlantic stock, separated conventionally at 5° N. There are three main fisheries which take albacore of the North Atlantic stock, two surface, troll and baitboat fisheries and one longline fishery. The combined catches of these fisheries reached a maximum level in the 1960's (about 60,000 MT). After that, catches fluctuated at about 50,000 MT until 1979. Since then, catches have decreased considerably, reaching a minimum level in 1981 (34,100 MT), and then increased in 1982 to 42,100 MT (Table 6, Figure 16).

Catches of the south Atlantic stock are taken mainly by longline, although in the last few years a surface fishery is developing. The total catch has fluctuated between 20,000 MT and 34,000 MT since 1964 (Table 6, Figure 17). Since 1975,when a low catch was recorded (17,500 MT), there has been a slight annual increase in catches to 28,400 MT in 1982. The surface catches of this stock have progressively increased from 200 MT in 1978 to 3,700 MT in 1982.

In considering the total Atlantic albacore catches (north and south stocks) a decrease can be noted since 1972 (Table 6). For the North Atlantic stock, surface fishery effort (Figure 18) has declined sharply since 1967, principally in the troll fishery. Longline effort (Figure 19) decreased from 1977 to 1980 and then increased slightly in 1981 and 1982.

Effort exerted on the south Atlantic stock (Figure 20) increased slightly for the 1974 to 1982 period. Surface fishery effort, though low, has increased in recent years.

In general, a decrease in catch and effort is observed for the North Atlantic stock, while the south Atlantic stock is showing a slight, but constant, increase in effort and catches since 1975.

ALB-2 State of the stocks

ALB-2.1 North Atlantic stock

The CPUE of age 3 and 4 fish (Figure 21) for the combined surface fisheries are used to index the abundance of juvenile fish (2 to 5 years). The CPUE suggests that after a rapid reduction in 1975 and a sudden increase in 1979, abundance is currently at average levels of the historical series (1957-1982). The wide fluctuations in abundance observed since 1970 could possibly be due to the lack of more precise data. As regards

adult fish (age 5 and over), if longline CPUE is used as an index of abundance (Figure 22), then the situation seems to have remained relatively stable since 1975.

The production model fitted to the data this year used baitboat fishing days, since it appears that baitboat CPUE is a better index of abundance than the CPUE of other fisheries. The MSY obtained was in the range of 64,500 MT and 56,000 MT with $m = 1$ and $m = 2$, respectively, and the corresponding fishing effort is from 117,000 to 76,400 standard baitboat days (equivalent to 240,000 and 160,000 troll days, the standard of effort used last year), respectively (Figure 23). Data for 1982 (42,100 MT of catches and 44,000 standard baitboat days) are below the MSY range (between 25 and 33 percent less in the case of catches, and between 42 and 62 percent less in the case of effort).

It should be noted, however, that marked changes in fishing patterns, little fluctuation in standardized fishing effort during the period studied, uncertainties about the appropriate value of k (an index of the number of significant age-classes in the fisheries), and the type of standardized effort used could adversely affect the reliability of this type of production model.

Analysis made in previous years shows that yield-per-recruit could have apparently increased, as a result of the decrease in fishing effort and catches of juveniles. Yield-per-recruit was estimated at 3.3 kg for the 1969 to 1973 period, and at 4.1 kg for the 1974 to 1978 period. This possible increase in yield-per-recruit could also be augmented by an increase in the average weight of catches taken by the surface fisheries in recent years (Figure 24).

Recruitment, as indexed by CPUE of age 3 fish in the surface fisheries, shows the same wide variations found in other estimates of recruitment. This variability is by a factor of 4 and increased in the latest years of the time series available.

In recent years, recruitment has decreased from 1968 to a low level in 1972. Later, recruitment increased to the high level of the 1976 cohort. Since then it has decreased for the 1977 and 1978 cohorts, and increased slightly in 1979 (Figure 25). The apparent differences in the CPUE levels of age 3 and 4 fish in 1981 and 1982 (Figure 21) and the CPUE levels of age 3 fish of the corresponding cohorts (1978 and 1979) (Figure 25) could be due to the unfavorable environmental conditions which may have made age 3 fish less available to the fishery than normal. If so, the CPUE for these years may not really indicate low recruitment of age 3 fish.

The relation between spawning stock and recruitment, established using surface CPUE of age 3 fish as an index of recruitment, and longline CPUE as an index of spawning stock, seems to indicate that small variations in the spawning stock are accompanied by wide variations in recruitment. This would seem to indicate that these variations could be caused, principally, by changes in environmental conditions, which seem to have occurred with the low index of recruitment abundance observed for the 1978 and 1979 cohorts mentioned earlier in this report (Figure 26).

After a period of intense exploitation of albacore in the North Atlantic, it seems that the species is currently being exploited at a moderate level and possible increases in effort would be followed by increases in catches, such as occurred in 1982.

ALB-2.2 South Atlantic stock

Longline CPUE (Figure 27) decreased from 1968 to 1973 and has remained stable

ever since. A production model (Figure 28) was fitted to the revised 1967 to 1982 effort data. This revision was made using Taiwanese and Japanese combined longline effort as a standard effort. Earlier analysis had been made using only the Japanese longline effort, or only Taiwanese effort for recent years since Japan shifted its effort to other species, whereas Taiwan is still directing its effort at albacore.

Two measures of effort were used. Case 1 used the number of effective hooks, whereas Case 2 used fishing intensity (in number of hooks/5 degree square). In both cases values of m = 0, 1 and 2 and k = 3 and 4 were used. Although in both cases the MSY range and the corresponding effort were very similar, we are only discussing Case 2 in this report since the effort measure seemed more reliable. In this case, the range of MSY obtained was 23,400 MT to 25,800 MT, with effort of 98.6×10^4 to 116.9×10^4 hooks/5 degree square. This MSY range is somewhat inferior to that obtained in 1982 (25,000 MT to 29,000 MT). Catches in 1982 (28,400 MT) and the corresponding effort (132.2×10^4 hooks/5 degree square) are 10 to 15 percent higher than the MSY. However, it should be noted that the fit of the model to the data is somewhat mediocre.

As there were no significant changes in the fisheries, earlier yield-per-recruit estimates are still valid. An increase in the size-at-first-capture would only slightly affect yield-per-recruit. An important development in the baitboat surface fishery directed at juveniles would produce decreases in the yield-per-recruit.

No new studies were carried out on stock/recruitment relation. According to current data it seems that south Atlantic albacore are being exploited at MSY levels. The continuing development of the surface fishery could result in modifications to MSY estimates already carried out. These surface fisheries could produce decreases in the yield-per-recruit from present levels.

ALB-3 Effects of current regulations

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

ALB-4 Recommendations

ALB-4.a Statistics

i) Catch and effort statistics should be improved for the Mediterranean albacore fisheries.

ii) Catch and effort statistics for the surface fisheries (baitboat and purse seine) of the south stock should be accurately compiled because of the impact these fisheries could have on this stock, should it continue to develop.

ALB-4.b Research

i) Previous recommendations concerning age and sex determination of adult albacore are still valid.

ii) For the north stock, studies should continue on the relation between spawning potential and recruitment and yield-per-recruit study should be updated.

iii) Studies on cohort analysis should be updated for both the north stock and the south stock.

iv) It is necessary that a recruitment index for the south stock be obtained.

v) It is essential that production model analysis, for the north stock as well as the south stock, be reviewed and adapted to the special characteristics of the fisheries taking these stocks; the sensitivity of the results relevant to the assumptions used should be indicated.

vi) Studies should be carried out to determine the relation between Mediterranean albacore and North Atlantic albacore, and information should be obtained on age, growth, recruitment, etc. for Mediterranean fish.

vii) Studies should be carried out on the existing relation between variations in oceanographic conditons and albacore abundance and availability to the fishery.

ALB-4.3 Management

The north stock seems to be in good condition although recruitment is variable and in the last two years seems to be at a relatively low level. The Committee did not present any specific management recommendations, although close monitoring of the fisheries is advised.

The south stock seems to be exploited at the MSY level, according to the model used, although abundance seems to be stabilized during the last few years. The Committee did not present any concrete recommendations regarding management of the south stock.

BFT–BLUEFIN

BFT-1 Description of fisheries

Bluefin tuna are exploited by numerous national gear-specific fisheries that are not only geographically and temporally distinct but which are also specific as to the size of fish. The major fisheries are found in the North Atlantic (in both eastern and western waters) and in the Mediterranean. The available tagging data show at present that there has been some interchange of fish between east and west, but variable, throughout time, but we do not know the extent of interchange. There are two spawning areas: one in the Gulf of Mexico and another in the Mediterranean, and the spawning seasons are different between these two areas.

Table 7-A shows catches in weight in the east and west Atlantic and Mediterranean. This table shows the changes made in statistics during the last three years, and some of these are very significant. The 1982 reported catch was 19,000 MT; 12,000 MT were from the Mediterranean, 5,800 MT were from the east Atlantic, and 1,200 MT from the west Atlantic. Table 7-B gives a breakdown of reported catches by gear and by country. Table 8 presents catches, in number of fish, for 1960-1981. These data are also shown in Figure 29-A (catch in weight) and Figure 29-B (catch in number).

BFT-2 State of the stocks

During 1982 SCRS discussions, the assessments used the year before (1981) for the adoption of regulation measures were re-examined. A consensus on the state of the stocks was not reached, and it was noted that further detailed discussions on the bluefin problem were necessary. Consequently, a Bluefin Workshop was held in Japan in September, 1983, to address the problems relative to data analysis and to attempt to solve them. A "preparatory" meeting for the Workshop took place in Trapani (Italy) in May, 1983. The methodology used to transform sample into catches was studied and agreed upon. The Workshop held in Japan intended to improve the data base. The present base can be considered as the best one, but the value of the base is intrinsically poor. This is a major limitation to a detailed analysis on the state of the stocks.

Some analysis methods could be used to determine the bluefin tuna stock status, such as a better analysis of larval data, aerial survey to count schools, etc. The Workshop concluded that it is impossible to obtain a CPUE abundance index of the entire stock that makes possible the development of production models. The diversity of spatial-temporal distribution of fisheries that are perfectly adapted to the behavior of age-specific stock segments and the long-lived nature of this species excludes the use of CPUE-based production models. On the contrary, CPUE could be useful as an index of abundance of particular size groups. The Workshop noted that there was not a more efficient method for bluefin stock studies than various forms of cohort (SPA, VPA, SVPA, etc.) analysis but that the use of these analyses should incorporate CPUE indices of abundance for recruits and spawners.

The Workshop recommended the use of a natural mortality rate of 0.10 to 0.18. It considered that, given the importance of the work to be performed to obtain a reliable first estimate of the stock status, it is unlikely that analysis carried out before 1984 will add significantly to the stock assessments.

Nonetheless, some preliminary studies using several methods have been presented this year to the SCRS. It should be noted that these works are only guides for research, but not intended for consideration as a basis for drawing any general conclusions on the present status of stocks.

The Committee noted some interesting observations for the western Atlantic. Incidental catches of bluefin by swordfish fishermen indicated that the strong 1973 cohort has entered the Gulf of Mexico spawning area in 1983. Fishermen's reports of observations off the U.S. east coast in 1983 indicated that the 1982 cohort seems abundant.

BFT-3 Effects of current regulations

The ICCAT regulation limiting fishing mortality entered into effect in August, 1975. With respect to this regulation, the Committee is encouraged to note that the 1973 year-class, which has been estimated to be strong in younger ages, entered into the Gulf of Mexico spawning area in 1983.

Up to last year, evaluation of the effects of this regulation was attempted by an analysis of fishing mortality for different ages calculated in cohort analyses. Since the validity of these analyses has been questioned, a new criterion must be used this year to evaluate the effects of this regulation. Information could be afforded by examining the

total catches in weight in different areas of the Atlantic and the Mediterranean (Table 7).

The catches of small (less than 120 cm) fish have consistently decreased in the western and eastern Atlantic since 1975, while the catches fluctuated considerably in the Mediterranean. The catches of large bluefin tuna increased since 1978 in the Mediterranean. These catches declined steadily from 1977 to 1981 in the eastern Atlantic, but rose last year to the 1977 level. The catches of large fish in the western Atlantic were relatively stable from 1977 to 1981 then decreased substantially in the following years as a result of the catch regulation.

A regulation limiting the catches of bluefin less than 6.4 kg went into effect in August, 1975. After the regulation, the percentage (Table 10) of individuals less than 6.4 kg (6.4 kg = 69 cm) is low (2 to 8 percent) in the western Atlantic but is still important in the east Atlantic (40 to 63 percent) and in the Mediterranean. The percentage of reported undersized fish declined from 52 to 12 percent from 1977 to 1982 in the Mediterranean.

A regulation limited the western Atlantic catches in 1982 and 1983 to 1,160 MT and 2,660 MT, respectively, and forbade fishing directed at the spawning stock in the Gulf of Mexico. This regulation was applied, as can be seen by the considerable decrease in the catches recorded in 1982 (Table 8 and Figure 29). Recent management measures reduced considerably the fishing mortality in the west Atlantic. At present, however, there are no means to adequately evaluate the effects of this regulation on the status of the stock on a quantative basis.

BFT-4. Recommendations

BFT-4.a Statistics

The Committee recommended:

i) That all countries submit to ICCAT catch-at-size data by the finest time-area (not less than monthly) resolution available by March, 1984. The Secretariat shall, in collaboration with national scientists, determine area-time designations for catch without such information.

ii) That a set of standards for collection and reporting of statistics to the Secretariat as well as a mechanism to insure that such standards are followed be developed.

iii) That dependable statistics for the Mediterranean Sea fisheries of non-member countries be collected. An action, among the options available to the Secretariat, should be executed in 1984 to obtain historical and current statistics for the fisheries.

iv) That bluefin tuna catches made by the Japanese longline fishery in 1957-1966 be reviewed in terms of its east-west division to be used in the stock analysis. Until a detailed study is completed, the Committee recommended that all catches from the equatorial and south Atlantic regions during those years be designated from the western stock, for analysis purposes under the two-stock hypothesis.

v) That statistics for the major fisheries be made available on a more timely basis. The goal for 1984 is to have available at the SCRS meeting (November, 1984) complete Task I, II and size data for the 1983 season and partial data for the 1984 season.

BFT-4.b Research

The Committee recommended:

i) That studies to determine the frequency and periodicity of transatlantic migrations be undertaken. The U.S. should provide information on cost of the new X-ray analysis of micro-elements in hard parts by November, 1984.

ii) That studies be undertaken on the use of over-flight data to index recruitment abundance.

iii) That larval survey data to index spawning stock abundance be collected and analyzed. The U.S.A. was urged to pursue such research in the Gulf of Mexico, and Spain in the Mediterranean Sea.

iv) That a feasibility study be undertaken to appraise the use of hydro-acoustical methods for censusing the spawning population. The U.S.A., Canada and Japan will collaborate to produce a report by November, 1984.

v) That a mark-recapture data file for the western Atlantic be prepared and maintained by the Secretariat. The U.S.A. should prepare the initial file as soon as possible.

vi) That all mark-recapture data for the Atlantic and Mediterranean be analyzed by October, 1984. Spain, Japan and the U.S.A. should undertake this analysis.

vii) That analysis of CPUE by 1 degree square data for selected areas of the Japanese longline fishery be undertaken. Japan should make the data available as soon as possible.

viii) That the possibility of sex-specific growth curves be investigated with use of length by sex data. France should undertake this study and have results available as soon as possible.

ix) That the following criteria be followed in future VPA:

–Develop techniques to estimate age from length that account for different growth rates among individuals and among cohorts of different abundances.

–Study and report the reliability of calibration methods via simulation. Assumptions such as zero intercept may not be forced to hold but rather be used in the tuning process to choose between different fishing mortality vectors. Further, calibration should be based on catch and effort samples, not on the estimates of totals after prorating. Such calibration should be on the basis of a fine resolution of time and space.

–Use a single age compartment for older fish. However, the presence of fish older than the last age employed in VPA should be used in forward projections.

–Use VPA procedures that do not assume that the last age in the catch is the last age alive using Z = M for forward projection of a cohort.

–Use the range of natural mortality from 0.10 to 0.18 which seems reasonable given the current information. The use of M's outside this range should be justified by additional data.

BFT-4.c Management measures

The Committee at its 1982 Meeting was unable to provide the Commission with firm advice on Atlantic bluefin, particularly with respect to the west Atlantic stock. During the present 1983 Meeting, the Committee noted that a major effort has been made to correct the bluefin catch-at-age information, but much more work needs to be done on other aspects of the bluefin data base before a comprehensive analysis of the condition of the bluefin stock can be completed.

West Atlantic stock

The Committee does not have any new advice for management.

East Atlantic stock

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

Total Atlantic stock

If the stock were to be managed on the basis of a single stock, the Committee has no advice for new management measures.

BIL–BILLFISHES

BIL-1 Description of fisheries

Billfishes are distributed over the tropical and temperate waters of the Atlantic Ocean. Blue marlin, white marlin, sailfish and longbill spearfish are caught by many fisheries, both directed and incidental, throughout their ranges. Black marlin are also present in the Atlantic Ocean, but they are rare and negligible in the landings. Major catches of billfishes are incidental to the tuna longline fisheries of several countries. Secondary fisheries are the directed recreational fisheries of the U.S.A. and Senegal. Also, there are developing industrial and artisanal fisheries for sailfish, especially in Ghana and Senegal, as well as incidental catches in the tropical tuna purse seine fisheries. Of these billfishes, the most important in terms of landings in recent years is blue marlin, followed by sailfish/spearfish and white marlin. Sailfish and spearfish are often treated as a species group, since the longline statistics for these species are mixed. The catch statistics of blue

marlin and white marlin by countries, 1957-80, are given in Tables 11 to 14. Catch statistics for sailfish/spearfish and the 1981-82 data for the marlins are provided in Table 15. These tables represent the best estimates of catch based on the revisions adopted by the Intersessional Billfish Workshop in 1981.

BIL-2 State of the stocks

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

BIL-2.1 Blue marlin

Landings from the total Atlantic (Tables 11 and 15) and the North Atlantic (Table 12) show a continual decline over the period 1975-79 with an increase in 1980, reflective of the doubling in Japanese longline catch. Landings have continued to increase in 1981 and 1982. There was a corresponding decline in Japanese effective fishing effort (Figure 30) from 1975-1978 followed by an increase for 1979-1980. CPUE slightly increased during 1977-80, but only to a level still below the 1965-75 average (Figure 31). Production model results (Figures 32 and 33) indicate that some over-exploitation may have occurred during the early to mid-1970's, but fishing effort in recent years (1978-80) appears to be below the level associated with maximum sustainable yield. As concluded in last year's report, the Committee remains unsure of the exact status of blue marlin, but given the low CPUE levels of recent years (through 1980) and the production model results, concern is expressed about any increase of effort on the stocks. The Committee believes that fisheries taking blue marlin, either directed or undirected, i.e. sport or commercial fisheries, should be closely monitored and if further analysis confirms this apparent low level of abundance, consideration should be given to methods of reducing fishing mortality on this species.

BIL-2.2 White marlin

Landings from the total Atlantic (Tables 13 and 15) and the North Atlantic (Table 14) show a negative trend over the period 1971-80. Total Atlantic landings have increased in 1981 and in 1982. There has been a continuing decline in Japanese effective effort (Figure 34) over the period 1971-79, with an increase occurring in 1980. CPUE (Figure

35) in the total Atlantic decreased sharply from the high in 1961 through 1964, increasing through 1967 and has fluctuated with a basically decreasing trend to the present (1980). Production models do not appear to fit the white marlin data adequately and little useful management information can be derived from the method. As concluded in last year's report, the Committee remains unsure of the exact status of white marlin but with the declining trend and low CPUE levels of recent years, concern is expressed about increased levels of effort on the stock. The Committee believes that fisheries taking white marlin, either directed or undirected, i.e. sport or commercial fisheries, should be closely monitered and if further analysis confirms this low level of abundance, consideration should be given to methods of reducing effort on this species.

BIL-2.3 Sailfish

Landings from the total Atlantic (Table 15) have fluctuated over the period 1968-82 with no apparent trend. Landings in 1982 (2,400 MT) were slightly above the previous 14-year average (2,200 MT).

BIL-2.3.a Western Atlantic stock

In the western Atlantic areas, hook rates from the Japanese longline fishery (Figures 36 and 37) appear to fluctuate without apparent trend. Age composition of samples from the U.S. recreational fishery (Figure 38) indicate that average age (and size) has declined since the 1950's but the age composition appears to be quite stable over the past ten years or so. Age composition for the Japanese longline fishery, available only for 1971-76, is also stable. Yield-per-recruit analysis (Figure 39) indicates that recent fishing mortality levels are about 40 percent below $F_{0.1}$ (the point where the slope of the curve is one tenth the slope at the origin; see Figure 39). Considering these data collectively, sailfish appear to be only moderately exploited. However, the fishing mortality and natural mortality rate estimates are nearly equal ($F = M = 0.34$), a condition often assumed to occur at the point of maximum sustainable yield, and the Committee cautioned that further analysis of catch and effort data (e.g. VPA and/or production model analysis), in conjunction with yield-per-recruit analysis, would be needed before a more definitive assessment of the status of stocks could be made.

BIL-2.3.b Eastern Atlantic stock

Japanese catch-per-unit-effort (CPUE) of sailfish/spearfish declined from the mid-1960's to the early 1970's, then fluctuated without trend (Figure 40). Senegalese CPUE of sailfish, 1970-80, has also fluctuated without apparent trend (Figure 40). There are no other means to evaluate the eastern Atlantic stock at this time. Renewed efforts to report catch, effort, and size data are recommended because of the uncertainty of the status of the stock and the reported increases in the sport, artisanal, and industrial fisheries along west Africa.

BIL-3 Effects of current regulations

No ICCAT regulations are currently in force for billfishes.

BIL-4 Recommendations

BIL-4.a Statistics

i) Catch and effort statistics from all longline countries should be reported by 5 degree area and by month for each of the billfish species. Currently only Japan reports its catch and effort statistics in this manner (Table 16). Size frequency data should also be reported by month for each species.

ii) Catch statistics for sailfish and spearfish, in particular, should be reported separately by all countries in order to facilitate stock assessment work on both of the species. Sailfish statistics (separated from spearfish statistics) should be reported for the east/west Atlantic in the future rather than north/south, as currently reported, and historical statistics should also be segmented in this manner. An appropriate dividing line is given in Figure 41. ICCAT billfish areas should also be adjusted to accomodate the east/west stock structure hypothesis. When appropriate size data are not available for converting number to weight or vice versa, data should be reported in the original units, as reported to ICCAT.

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

iv) Comprehensive data collection for the sailfish fishery off Senegal should be continued and improved data collection in Ghana should be carried out due to the development of commercial fisheries on this species during apparent spawning aggregations.

v) At the 1983 SCRS Meeting, several longlining nations have reported that some of their fishing operations are deploying longline gear in non-traditional ways, e.g., deep longlining for bigeye tuna (Japan) and shallow longlining for sailfish (Cuba). Such differences in the deployment of longline gear may affect the catchability of billfishes (and other species). It is requested that each longline nation prepare a description of its current and past longline operations for the 1984 SCRS Meeting in order to evaluate the need to further stratify the Task II catch and effort statistics by depth of fishing.

BIL-4.b Research

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

i) Studies be continued on age and growth of marlins to provide accurate information for study of population parameters for cohort analyses and yield-per-recruit analyses; and that preliminary findings be reported.

ii) Further data collection and analyses be done from both the commercial and recreational fisheries for billfishes to determine indices of abundance which take into account changes in target species of the longline fleets and the incidental catch problems. Particularly, investigations into possible alternatives to using Japanese longline catch rate data for standardization should also be begun, e.g. standardization of effort from the Taiwanese longline fleet.

iii) Stock assessment work on sailfish should continue. Improvements in the data base and better estimates of population parameters should enable more progress to be made in this area.

iv) Production model analysis of blue marlin and white marlin should be updated to provide a more current assessment of the status of the stocks.

BIL-4.c Management

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

SWO-SWORDFISH

SWO-1 Description of fisheries

Swordfish are taken primarily in directed fisheries using longline, harpoon and sport gear, although they are also taken, quite often, by longline and other gears directed at other tuna species.

Countries participating in the fisheries are listed in Table 17. The total catch in 1982 (Atlantic and Mediterranean) was 19,400 MT, which is 5.4 percent below the historical maximum recorded during 1950-1982 but was 28 percent above the 1981 catch of 15,800 MT. It should be recalled that the total Atlantic catches decreased from 14,600 MT in 1970 to 7,100 MT in 1971, when fishing was reduced as a result of mercury content restrictions by some of the major consumers of swordfish. When these restrictions were relaxed, catches returned to previous levels, and 13,100 MT were recorded in 1978.

In the Atlantic, catches recorded for 1982 are the highest in the historical series during 1950-1982, with 15,500 MT, which is an increase of 34.8 percent over 1981 and a 17 percent increase over the previous three-year average (13,200 MT).

Mediterranean catches reported for 1982 were 3,900 MT, declining 15.2 percent from the 1981 catches. This decrease could be due to delays in receiving catch information from countries normally fishing for swordfish in the Mediterranean (Table 17 and Figure 42).

SWO-2 State of the stocks

No new information was presented that enabled the Committee to choose any specific hypothesis of stock structure in the Atlantic and Mediterranean.

CPUE data from the Spanish longline fishery have shown no specific trend during 1973-1982. The 1982 CPUE remained at the previous years average level (Figure 43).

As no new data were presented this year on the state of the stocks of this species, the conclusions reached last year are still valid in that the adjusted CPUE in the Japanese longline fishery in the total Atlantic (Figure 44) has been relatively stable over the past decade. However, this index in the northwest Atlantic area (north of 5°N, west of 40°W) has exhibited a steady decrease in recent years, 1977-1980 (Figure 45). Though this may indicate a decline in the abundance of swordfish in the northwest Atlantic area, it is cautioned that since the fishery was not targeting swordfish and since Japan's share of the total Atlantic catch (northwest Atlantic share is unknown) has been very small throughout the history of the fishery, the trend may not reflect a real change in the stock abundance.

No new data were reported pertaining to production model or yield-per-recruit analyses. Therefore, the reservations expressed in the 1982 SCRS Report concerning the accuracy and applicability of the analyses presented at that time remain the same.

The lack of adequate data precludes any firm conclusions regarding the status of the stock(s) or stock structure.

SWO-3 Effects of current regulations

No ICCAT regulations are currently in effect for swordfish.

SWO-4 Recommendations

SWO-4.a Statistics

There have been no noticeable improvements in swordfish catch statistics since the Intersessional Billfish Workshop (1981). Therefore, there are still deficiencies in the availability of detailed catch, sampling and effort data. The Committee recommends:

i) Swordfish catch and effort statistics should be reported by 5° area and by month. If this is impractical, then statistics should be reported by ICCAT billfish area and by month. Of the principal countries landing swordfish, those particularly lacking 5° area statistics are Canada, Italy, Spain and the U.S.A.

ii) Due to areal variation in sex ratio and great differences in growth rate by sex, any stock assessment model should consider the sexes separately. Therefore, it is necessary to have length frequency data by sex collected on a regular basis.

iii) Due to known under-reporting of swordfish catches by Canada and the U.S.A. since the imposition of mercury content restrictions in 1971, attempts should be made to estimate the magnitude of the catches that were not recorded and may not yet be recorded under existing conditions in spite of the fact that the U.S. has considerably improved catch information in 1982.

iv) Effort should be made to obtain data on the catch, effort and size distribution of new swordfish fisheries, such as the one recently initiated off Senegal.

SWO-4.b Research

As noted in the 1981 SCRS Report, the lack of basic data on growth, mortality rates and stock structure severely hampers many of the standard analyses used in population dynamics. Therefore, it is recommended that:

i) Studies be continued on the age and growth of swordfish and detailed results be made available for review.

ii) To facilitate the collection of size frequency data by sex, the possibility of using a laboratory or clinical test to determine sex from tissue samples of dressed fish be investigated.

iii) In order to help determine stock structure, biochemical and parasite studies as well as other analytical techniques, be initiated through combined and coordinated studies by concerned scientists. Further tagging programs should be emphasized, to include, but not be limited to, tagging swordfish in the Mediterranean and in the east and south Atlantic.

SWO-4.c Management

No recommendations on management measures were presented.

SBF–SOUTHERN BLUEFIN TUNA

SBF-1 Description of fisheries

Southern bluefin tuna comprise a single unit of stock in the temperate waters of the southern hemisphere. The only known spawning ground is located in the Indian Ocean off northwestern Australia. Size composition of catches and tagging results reveal that the fish at younger ages are distributed in coastal waters of Australia, and as the fish age, they migrate circumpolarly in the offshore waters of the Pacific, Indian and Atlantic Oceans.

In recent years, three countries are harvesting southern bluefin tuna. The developing New Zealand handline fishery caught 257 MT of large-sized fish in the coastal waters off New Zealand in 1982. The catch by the Australian near-shore surface fishery (baitboat and purse seine) has been rapidly increasing and reached 18,000 MT in 1982. This catch was mainly comprised of young fish. The Japanese longline fishery, operating for adult fish in off-shore waters of all oceans, harvested 25,000 MT in 1981, which was less than the 1980 catch. In the Atlantic, southern bluefin are caught by the longline fishery, and the catch has varied widely between 500-6,200 MT during 1970-1982 (Table 18), reflecting the shift of fishing effort between oceans.

SBF-2 State of the stocks

A scientific meeting on southern bluefin tuna was held in Shimizu, Japan, in April, 1983, and scientists from Australia, New Zealand and Japan participated. The discussion was focused on the results of cohort and yield-per-recruit analyses. It was pointed out that the spawning biomass has recently been lowered to one-third that of the virgin stock level. Although recent recruitment had not been reduced, judging from the increasing trend of small-fish catches by coastal surface fisheries, it was noted that a further decrease in the spawning biomass might result in a reduction in the level of recruitment. It was also recognized that a further increase in the catch of young fish would result in a marked decrease in yield-per-recruit and spawning biomass. The meeting identified several combinations of allowable catches by surface (for young fish) and longline and handline (for adult fish) fisheries to maintain the current level of the spawning stock, and recommended that necessary steps be taken by concerned countries after they had considered the findings of the meeting.

SBF-3 Effects of current regulations

It was reported that regulatory measures to conserve the stock are now under consideration by the countries concerned. It was also noted that the Japanese longline fishermen had voluntarily been taking measures to prevent a further decline in the average age-at-first-capture since 1971 by setting closed areas and seasons in order to reduce the catch of smaller fish.

SBF-4 Recommendations

The Committee made no special recommendation for management of southern bluefin tuna in the Atlantic Ocean.

SMT–SMALL TUNAS

SMT-1 Description of fisheries

In recent years the landings of small tunas in the Atlantic have been between 70,000 and 100,000 MT annually. An apparent increase in catches of small tunas by Senegal, from around 3,000 MT in 1981 to about 4,500 MT in 1982, principally of Atlantic little tuna, is likely due to an improvement in national statistics. The small tunas are caught both by directed fisheries and incidentally in the Mediterranean (Atlantic bonito and frigate tunas), and incidentally in the Gulf of Guinea purse seine fisheries. There are also directed artisanal fisheries in developing countries in which the small tunas are an important source of food.

Table 19 shows the best available current data on catches of small tunas.

SMT-2 State of the stocks

It is not possible to arrive at any conclusions on the status of the stocks with the available data.

SMT-3 Effects of current regulations

There are currently no ICCAT regulations in effect on small tunas, and the Committee is not aware of any national regulations. It is quite possible, however, that the minimum size regulations now in effect for yellowfin and bigeye tunas could have some effects on the small tunas, since several species occur in mixed schools with yellowfin and bigeye.

SMT-4 Recommendations

The Committee is pleased to note that some of the recommendations on research and statistics from last year have begun to be implemented.

SMT-4.a Statistics

The data on small tunas presently in the ICCAT data base fall short of being adequate. For example, the Turkish catches of Atlantic bonito in the Mediterranean, the major component of the Atlantic small tuna catches, are represented neither by catch and effort nor by size data. Also, many ICCAT member countries have not submitted appropriate data for the data base. The Committee recommends:

i) That the member countries make commitments to collect the appropriate data and submit them.

ii) That the Secretariat make more effort to secure the necessary data from non-member countries.

iii) That emphasis be directed to artisanal fisheries and to discards from industrial fisheries which primarily catch other species.

iv) That development of new fisheries be closely monitored.

SMT-4.b Research

i) Collection of information on spawning through larval surveys should be continued, especially in areas where there are important small tuna fisheries.

ii) Studies aimed at distinguishing between different stocks, such as biochemical work and tagging, should be continued.

iii) Studies on biological parameters should be carried out.

iv) Studies of distribution of species and of ecological relations through means such as the examination of predator stomach contents should be continued.

SMT-4.c Management

The Committee has no recommendations for management of fisheries for small tunas at this time.

MTR--MULTI-SPECIES--TROPICAL

MTR-1 Major concerns

Two categories of multi-speices considerations have been recognized by the SCRS: biological interactions among species and exploitation of mixed species by fishing gear. New information received this year was primarily relevant to the category of multi-species exploitation. The focus of concern in this respect is the mixture of juvenile yellowfin and bigeye in the catch of skipjack in the east Atlantic. On the one hand, analysis of catch data and tagging results indicates that skipjack are under-exploited and could well withstand increased harvest (SCRS/83/16). On the other hand, results from production models indicate that bigeye and yellowfin are supporting an exploitation level close to or greater than that associated with MSY (SCRS/83/46 and 78).

The problem is that optimizing the harvest of skipjack may impair the harvest of bigeye and yellowfin, and vice versa. The possibility of conflict between bigeye and yellowfin harvest strategy has not been mentioned.

MTR-2 Definition of problem

The first concern is to delineate the detailed, quantitative nature of the problem.

MTR-2.1 Yellowfin

A large amount of quantitative information with respect to yellowfin population dynamics was contained in report SCRS/83/78 and documents supporting it (SCRS/83/30, 32, 45 and 77). Of principal interest is (1) the evidence from yield-per-recruit analysis that a gain of up to 40 percent in yield-per-recruit could be realized if an effective lower size limit on yellowfin could be enforced, and (2) the lack of any trend in recruitment with time and the lack of a relationship between recruitment and an index of spawning stock. The implication is that yields from the fishery could be improved by changing the pattern of fishing effort with respect to size of fish, but that at current effort levels there is little concern for the ability of the stock to renew itself.

Evidence presented this year continues to indicate that a large percentage of the yellowfin catch is undersized (SCRS/83/47, 67, 74 and 77). Fish less than 3.2 kg account for approximately 68 percent by number of the baitboat yellowfin catch and approximately 57 percent of the purse seine catch. This means that more than 50 percent by number of the total 1982 catch (including longline catch) is undersized.

MTR-2.2 Bigeye

Information relating to population dynamics of bigeye is less complete than for yellowfin. Results of production model analyses presented this year indicate that effort may be approaching the level associated with MSY. No new yield-per-recruit analyses were presented this year, but evidence given in previous years indicates that up to 10 percent improvement in yield-per-recruit could be obtained by limiting the catch of juvenile bigeye. No reliable estimates of bigeye recruitment have been reported.

It is evident that significant numbers of undersized bigeye are still appearing in baitboat and purse seine bigeye catches for some components (48 percent and 56 percent, respectively, by number). The proportion of undersized bigeye in the total catch, however, appears less significant than it is for yellowfin. If the above proportions hold for all baitboat and purse seine catches, the proportion of fish less than 3.2 kg in the total (all gears) 1982 catch would be 8 percent by number according to the current catch table.

MTR-2.3 Skipjack

Much of the relevant quantitative information about skipjack was presented at the ISYP Conference in Tenerife (June, 1983). Based on analysis of skipjack catch data in the east Atlantic and also on results of a tagging program in the same area, the skipjack population experiences a relatively small fishing mortality in relation to the population turnover rate (SCRS/83/16 and 56). The evidence suggests that increased yields of skipjack could be sustained by increasing fishing effort.

MTR-2.4 Skipjack, yellowfin and bigeye

Evidence continued to accrue this year on the mixture of undersized yellowfin and bigeye with the skipjack catch (SCRS/83/47, 67, 74 and 77). Many of these undersized yellowfin and bigeye are reported as skipjack. It also appears that bigeye are often reported as yellowfin (SCRS/83/67). Correcting for this would diminish the proportion of undersized yellowfin in the total yellowfin catch (Section 2.1) and increase the proportion of undersized bigeye in the total bigeye catch (Section 2.2).

What is lacking so far in detailing this multi-species problem is a model which integrates the information about skipjack, yellowfin and bigeye and which gives quantitative estimates of the trade offs between skipjack, yellowfin and bigeye harvests.

MTR-3 What to do about problem

MTR-3.1 More directed fishing effort

One line of inquiry for alleviating the problem is to seek ways of directing the fishing effort more toward single species. Various possibilities were discussed at the ISYP Conference in Tenerife. These included: (1) passive, sonic and chemical attractants that might have a differential effect among tuna species, (2) changes in gear or methods of deploying gear that might take advantage of possible vertical stratification of species, (3)

redistribution of gear to time/area strata where purer schools might exist. None of the approaches under items (1) and (2) were thought to be very promising at the time.

Item (3), the redistribution of effort, has evolved to be the major preoccupation of the Working Group on Juvenile Tropical Tunas. New information of relevance in this regard was presented this year showing differences in concentration index between yellowfin and skipjack (SCRS/83/78). This indicates that the two species distribute themselves differently in time and space.

MTR-3.2 Find optimal effort level

Although methods may be found to better direct fishing effort towards individual species, it is likely that there will always be some degree of mixture in the catch. The problem in this case is to find an optimum harvest strategy in the face of conflicting interest in optimizing the harvest of the individual species. Given that there is little concern at present with the conservation of reproductive strength in either the skipjack or the yellowfin populations, and assuming such is the same with bigeye, this problem of finding an optimum strategy is primarily an econometric exercise. Such a task falls outside the mandate of the SCRS and should be left to qualified economists. It is conceivable, however, that an econometric analysis would need to draw on results of a fish population model similar to that suggested in Section 2.3 above.

MTE–MULTI-SPECIES INTERACTIONS – TEMPERATE SPECIES

Tunas, billfishes, swordfish and other large pelagic species that occur in the temperate regions of the Atlantic Ocean are taken with fishing gears such as longlines, pole-and-line, troll, etc. The catch with any particular gear rarely consists of a single species because the gear is "non-species selective" although often deployed in a manner to catch a particular species.

In previous SCRS reports, examples of multi-species tuna/billfish fisheries were presented. This year, several documents (SCRS/83/39, 44 and 52) were reviewed that contained information showing that longline fisheries for swordfish, both in the Atlantic and Mediterranean Sea, often caught tunas and sharks along with swordfish. In one fishery, the Cuban night longline fishery, it was reported that catches were primarily of sharks although the gear is directed at swordfish (SCRS/83/44).

Off the northwest coast of Spain, a tagging cruise was conducted by Spanish scientists in 1982 (SCRS/83/68). Troll gear was used to catch albacore for tagging and for biological information. During the cruise bluefin tuna, bigeye tuna, as well as albacore were caught, demonstrating that the troll gear is not species selective when deployed in that area.

The treatment of data obtained from multi-species fisheries has been an ongoing problem for the SCRS. The problem arises because current stock-assessment analytical techniques used by the SCRS require that the fisheries data be for single species. For catch and effort data from a multi-species fishery, catch is normally reported by species.

Fishing effort, however, is reported for the combined species caught. Thus, procedures for partitioning the nominal fishing effort into effective fishing effort for each species are required.

The Committee recommends that research on procedure for handling multi-species fishery data in stock assessments be encouraged.

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

The Report of the Working Group on Juvenile Tropical Tunas was presented by its Convener, Mr. J. B. Amon-Kothias.

The Committee recommended that the documented instructions given to this Working Group (1982 SCRS Report) be circulated together with the agenda for its next meeting, scheduled for July, 1984.

The report was adopted and is attached herewith as Appendix 4.

Item 8. REVIEW OF THE REPORT OF THE BLUEFIN WORKSHOP

The report of the two meetings held in 1983 concerning data base and research problems of bluefin tuna was presented (SCRS/83/15). At the "Preparatory Bluefin Meeting" held in Trapani, Sicily, Italy, agreements were reached on bluefin data matching and substitutions, and on the procedures for creating a common catch-by-size data base. At the formal Bluefin Workshop held in Tsukuba and Shimizu, Japan, the data base was completed, a critical review was made on the limitation of the data base when applied to age-specific population analyses, and several possible alternative techniques to evaluate bluefin populations were studied.

The Committee expressed its appreciation to various organizations which facilitated the scientists in organizing these meetings, especially the assistance rendered by the Tsukuba Office of the Research Council of the Ministry of Agriculture, Forestry and Fisheries, the Far Seas Fisheries Research Laboratory and the Libera Universitá di Trapani.

The Report of the Workshop, together with its appendices, was adopted by the Committee. The text of the report is attached herewith as Appendix 7.

Item 9. REVIEW OF THE REPORT OF THE SUB-COMMITTEE ON SKIPJACK AND ON THE SKIPJACK CONFERENCE

The Convener of the Sub-Committee on Skipjack, Dr. G. T. Sakagawa (U.S.A.) reported to the SCRS the Sub-Committee's activities during 1983. The major event was the Skipjack Conference held in June, 1983, in Tenerife, Canary Islands, Spain. The Conference was attended by 50 scientists. The Commission paid for round-trip travel for one scientist from each member country and for two guest speakers, Drs. R. Kearney and B. Rothschild. A total of 46 scientific papers were presented which reported on results of the International Skipjack Year Program (ISYP) and related information on skipjack tuna. Also, the group at the Conference drafted answers to the four basic questions asked

at the onset of the Skipjack Program. These answers, which summarize all the findings of the ISYP, are presented in document SCRS/83/16 (attached herewith as Appendix 3).

Dr. Sakagawa explained the procedure adopted by the Committee that all these scientific papers would be reviewed by scientific referees, under supervision of an ICCAT editorial group (P. E. K. Symons, G. T. Sakagawa and P. M. Miyake), and that those papers meeting the review standards would be published together with SCRS/83/16 by the Commission in a Collective Volume.

The Dobrocky Seatech Co. Ltd. has been contracted by ICCAT to do the general editing and assembly of papers to be included in the book. The publication is scheduled to be ready for distribution by the middle of 1984.

The SCRS approved these plans for publication and distribution. It also agreed to charge a minimal fee for the publication if requested by the private sector which is not involved in ICCAT work (e.g. a procedure similar to that followed for distribution of the Field Manual could be applied).

Recognizing that the recommendations for future skipjack research included in the Conference Report will be further considered by the SCRS, the Committee decided to dissolve the Sub-Committee on Skipjack, since its mission has been completed.

The Committee thanked the Skipjack Coordinator, Dr. P. E. K. Symons, the Convener of the Sub-Committee on Skipjack, Dr. G. T. Sakagawa, the Secretariat and all the scientists and countries who contriubted to the Program for their devoted effort and for the excellent work carried out. A telex from Dr. Symons was read in which he congratulated the Sub-Committee on bringing the Program to a successful close and expressed his pleasure in having worked with ICCAT scientists.

The Committee also expressed its appreciation to the Spanish Oceanographic Institute (I.E.O.) for all its assistance in hosting the Skipjack Conference at its Tenerife Laboratory.

Item 10. REPORT OF THE SUB-COMMITTEE ON STATISTICS AND REVIEW OF ATLANTIC TUNA STATISTICS AND DATA MANAGEMENT SYSTEM

The Report of the Sub-Committee on Statistics was presented by the acting convener, Dr. G. T. Sakagawa. Various recommendations were reviewed. The Committee would like to draw the Commission's attention to those recommendations which have financial implications. The report was adopted and is attached herewith as Appendix 5.

Item 11. REPORT ON ICCAT TRAINING COURSES IN STATISTICS AND SAMPLING

Document SCRS/83/18 was referred to under this Agenda Item. The Committee noted that two training courses on statistics were organized during 1983, one in Tenerife and another in Abidjan, and all the ICCAT developing countries were invited. All invited countries, except Korea, participated in either of the courses. There were some administrative difficulties on organizing a course for Korea and it was hoped that Korean scientists would have an opportunity to receive training at a research center outside Korea in the near future.

The SCRS noted that these courses were very successful and congratulated the two coordinators (J. B. Amon Kothias and A. González-Garcés) and the Secretariat as well as all the instructors. The Committee also thanked the "Centre de Recherches Océanographiques" in Abidjan and the "Centro Costero de Canarias" of the "Instituto Español de Oceanografía" for having provided meeting facilities for the courses.

Item 12. REVIEW OF SCRS RESEARCH PROGRAMS AND CONSIDERATION OF WORKING PROCEDURES

12.a Meeting organization and reporting procedures

The Report of the Working Group on SCRS Organization (attached as Appendix 6) was presented to the Committee by the Group's Convener, Dr. N. Bartoo (U.S.A.). After reviewing the proposal made by the Working Group, discussion ensued and was centered on two points, namely, meeting procedures and document policy.

Following proposals from the floor, it was agreed that:

i) For the 1984 SCRS Meeting normal meeting procedures and document policy will be followed as for the 1983 SCRS Meeting, except for bluefin tuna.

ii) A Working Group on Bluefin be formed at this session. This Group will be open to any members. This Group will discuss and evaluate statistics and assessments submitted to the 1984 SCRS Meeting. A convener will be selected by the SCRS officers. The convener will also serve as head rapporteur for the bluefin stock evaluation at the 1984 SCRS Meeting.

iii) The Bluefin Working Group will meet on the Wednesday of the week preceding the opening of the SCRS Meeting. The deadline for submission of any bluefin documents is one night before the Working Group meets.

iv) Computer facilities will be made available to the Working Group to re-analyze the data, if necessary, during the session. This may be achieved by installing a data base and/or analytical programs with the ICCAT system (INFONET) or through direct access to computers in national laboratories.

v) The exchange of programs and analytical procedures among the Bluefin Working Group scientists during the inter-sessional period was encouraged. Documentation of programs which any scientist wishes to use on the ICCAT computer at the Working Group meetings should be sent to the Secretariat at least two weeks before the opening of the meeting. Besides, the scientist using the programs is encouraged to arrive at the meeting place two days before the meeting starts in order to confirm that the program runs correctly.

vi) Next year, for all species, Report A will include an evaluation of analytical techniques and methodology used in the assessments.

vii) For all species annotated instructions for each section of Report A and Report B shall be prepared and attempts should be made to define terminology used in the three official languages before the rapporteurs' work starts.

12.b ICCAT Symposium

The Committee considered the proposal made by the Sub-Committee on Statistics that one day of the SCRS be dedicated to discussion of the procedures in collecting and reporting statistics.

The Convener of the Working Group on Eco-biological Aspects of Tunas, Mr. A. González-Garcés, informed the Committee that the assignment to his Group would terminate at the end of the 1983 SCRS Meeting; therefore, they had no proposals for the 1984 SCRS. Taking note of this fact and that one day of the SCRS session can be spared, the Committee adopted the Sub-Committee's proposal. Mr. P. Cayré (Senegal) was appointed convener of this one-day session. Its agenda will be circulated through correspondence.

12.c Bluefin stock identification

A report was received on the progress made during 1983 on sampling in the eastern Atlantic of bluefin hard parts for X-ray analyses. Cooperation by ISTPM (Seté, France), IEO (Málaga, Spain), Italian scientists, and the Secretariat was appreciated by the Committee.

The U.S. reported that progress has been made on analyses of these samples. It was noted that an informal progress report is available at this time, and the methodology is still experimental. At the end of 1984, the results of this pilot analysis and cost of use of the technique for large samples will be evaluated and a decision will be made on continuation of the project. The U.S. noted that a report of the work is planned for distribution at the November, 1984, ICCAT meeting.

12.d Intersessional meetings

The Committee recognized a possible conflict between the proposals made by the Sub-Committee on Statistics and the Working Group on Juvenile Tropical Tunas concerning the completion of the tropical tuna data base. In light of this, the Secretariat observed the following:

i) The guideline set forth by the Standing Committee on Finance and Administration (STACFAD) establishes that participation at the ICCAT meeting be funded by each member country. Therefore, holding a formal ICCAT meeting for the data base (as proposed by the Working Group on Juvenile Tropical Tunas) may not warrant ICCAT financial support to attendants.

ii) The Secretariat foresees some difficulties in updating and completing on time a common data base for tropical tunas, particularly for the FISM, Spanish and Tema-based fleets.

iii) Considering the above, the Secretariat proposes that an informal preparatory meeting, e.g. like the one held in Trapani (May, 1983), be held in late January, 1984,

and the agenda to include items suggested by the Working Group on Juvenile Tropical Tunas.

iv) Since the original logbook data base for the FISM and Spanish fleets as well as computer facilities are available in Dakar, the most suitable place to hold such a meeting is Dakar, Senegal.

v) Therefore, pending a formal invitation from Senegal, the Secretariat would like to hold this meeting in Dakar.

vi) In order to complete its assignments, the Secretariat would invite one scientist each from Ghana and Ivory Coast to the meeting at the expense of the Commission. The Secretariat would also be represented at the meeting with the appropriate staff.

Noting that under the scheme proposed by the Secretariat, the data base will be completed and made available to all interested parties of the SCRS by March, 1984, the Committee approved this proposal.

The Committee also approved the meeting of the Working Group on Juvenile Tropical Tunas scheduled for July 9-18, 1984. If a formal invitation is received from the French authorities by the end of 1983, the meeting will take place in Brest, France. Otherwise, it will be held in Madrid.

12.e Evaluation of the need for a micro-computer

The Committee reiterated the recommendation made by the Sub-Committee on Statistics on this matter.

12.f Other matters

Noting that three distinct working groups have either been established or suggested for bluefin, the Committee decided to terminate the Working Group on Juvenile Bluefin Tuna. It also decided to merge the Working Group on Bluefin Statistics proposed by the Sub-Committee on Statistics into the general Bluefin Working Group.

Item 13. COOPERATION WITH OTHER ORGANIZATIONS

The pertinent section of the Administrative Report (COM/83/10) was reviewed. Special close cooperation maintained with FAO and its subsidiary bodies (CECAF, GFCM, IOFC, IPFC, etc.) concerning statistics and tuna research was noted.

The Report of the Ad Hoc Inter-Agency Consultation on Atlantic Fisheries Statistics (CWP) was presented (SCRS/83/28). Noting that the next session of CWP is scheduled for the summer of 1984 in Copenhagen, the Committee decided that ICCAT should be represented by the Secretariat.

Item 14. REVIEW OF SCIENTIFIC PUBLICATIONS

All the scientific publications issued by the ICCAT Secretariat were reviewed. They include the Report for the Biennial Period, Statistical Bulletin, Collective Volume of Scientific Papers, Data Record and Statistical Series.

The Committee noted that all these routine publications are issued quite timely and are useful. The formats are also satisfactory. The Secretariat was congratulated for its effort in maintaining these publications at a satisfactory level.

The Committee reviewed the publication policy presented at the Skipjack Conference by the Sub-Committee on Skipjack (Item 9). The progress made in having the papers reviewed by referees not normally working with ICCAT was studied. After some discussion of priority between high quality publication and rapid dissemination of the report, the Committee approved the policy decided upon at the Skipjack Conference and hoped that these reviewing and editing procedures would not cause any delay in publication.

The publication policy for the Report of the Bluefin Workshop was questioned. The Committee decided to append only the text of the Workshop Report (Appendix 7) to the SCRS Report, for inclusion in the Biennial Report. The entire report including tables and appendices should be published as a special volume of the Collective Volume of Scientific Papers. As the data base table is subject to change, a footnote to that effect was suggested.

Item 15. RECOMMENDATIONS

The SCRS recommendations concerning statistics, research and management on the tuna species are found in Section 4 of the respective species reports (Item 6). Likewise, the Commission should refer to the recommendations in the Reports of the Skipjack Conference (Appendix 3), the Working Group on Juvenile Tropical Tunas (Appendix 4), the Sub-Committee on Statistics (Appendix 5), the Working Group on SCRS Organization (Appendix 6), and the Bluefin Workshop (Appendix 7). Special attention should be paid to the report of the Skipjack Conference as it contains the SCRS's answers to the four questions asked by the Commission at the initiation of the International Skipjack Year Program (ISYP).

Item 16. DATE AND PLACE OF NEXT MEETING

The Committee decided that the 1984 SCRS meeting would be held at the same place as the Commission meeting, starting on Thursday of the week preceding the 1984 Commission meeting.

As agreed under agenda Item 12.a, the Bluefin Working Group will begin its discussions on Wednesday of the week preceding the 1984 SCRS meeting, at the same place as the SCRS meeting.

Item 17. OTHER MATTERS

No other matters were discussed.

Item 18. ELECTION OF CHAIRMAN

Mr. S. Kume (Japan) was asked to chair the election of the SCRS Chairman for the next biennial period. Ivory Coast proposed to reelect Mr. J. S. Beckett and Spain seconded the motion. All the other member countries present supported the proposal. The excellent chairmanship Mr. Beckett has demonstrated during the past term was commended by the audience, and he was congratualted for his reelection.

Item 19. ADOPTION OF REPORT

The Committee thanked the Secretariat for its efficiency in successfully carrying out all the business of the SCRS session and for its work throughout the year. The Report was adopted.

Item 20. ADJOURNMENT

The meeting was adjourned.

Table 1. Atlantic yellowfin tuna catch (1,000 MT)

	1970	*1971*	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*	*1980*	*1981*	*1982*	*1983**
TOTAL	75.4	73.3	94.0	94.6	106.7	124.6	125.5	127.9	133.4	126.5	120.0	143.6	144.5	123.4
East Atlantic	60.7	57.7	78.6	79.7	92.2	108.1	111.8	114.5	118.3	112.4	107.1	126.7	119.1	100.4
– Surface	43.9	44.4	60.6	60.5	75.3	94.5	99.0	98.9	107.1	105.7	94.6	118.8	109.1	90.4
Baitboat	9.4	10.4	12.8	14.3	19.4	9.3	12.8	11.0	8.7	12.8	7.0	9.4	9.1	7.9
Angola	.3	.5	.6	.6	.8	.1	1.0	1.9	2.0	.8	.5	.7	1.4	1.2
FIS	7.5	7.6	7.5	5.5	6.3	2.9	3.7	3.4	2.8	2.1	2.1	2.8	2.9	2.0
Ghana	0.	0.	.0	.1	.3	.7	.8	.6	.3	.3	.3	1.0	.7	1.0
Japan	.8	2.0	3.5	6.5	7.1	1.1	4.9	2.6	1.4	1.0	.7	2.6	1.8	2.5
Korea-Panama	0.	0.	.4	.8	2.8	3.5	2.0	2.1	1.7	4.1	2.1	1.5	1.1	.0
Spain	.7	.4	.7	.8	2.0	1.0	.2	.3	.2	.1	.1	.1	.4	.4
Others	0.	0.	0.	0.	.0	.0	.0	.1	.2	4.4	1.2	.7	.8	.8
Purse seine	33.9	32.6	47.8	44.9	53.4	83.4	86.2	87.6	97.6	91.7	87.1	108.6	99.6	82.1
FISMP	17.2	19.2	24.6	26.7	32.9	45.1	50.5	47.9	53.7	48.9	49.9	51.7	43.4	32.5
Japan	1.1	2.0	2.5	1.2	.8	.1	0.	0.	0.	0.	0.	0.	.8	1.0
Spain	6.4	7.2	8.6	13.2	13.7	23.8	33.1	33.2	35.1	39.2	34.2	50.8	48.3	44.0
U.S.A.	9.0	3.8	12.0	3.0	5.6	14.0	1.7	6.4	8.1	2.9	1.6	1.5	.6	.0
Others	.2	.4	.2	.8	.4	.4	.8	.2	.6	.7	1.4	4.7	6.6	4.6
Other gears	.5	1.4	.0	1.2	2.5	1.9	.0	.3	.8	1.2	.4	.8	.4	.4
– Longline	16.8	13.2	18.0	19.2	16.9	13.6	12.8	15.6	11.3	6.8	12.5	7.9	9.9	10.0
China (Taiwan)	3.9	3.4	3.5	1.5	1.0	1.3	.6	.2	.2	.2	.1	.4	.2	.4
Cuba	1.1	1.4	3.2	4.5	3.0	1.7	1.8	2.9	1.9	2.6	4.9	2.5	2.1	3.6
Japan	2.5	1.6	2.3	1.3	.7	1.7	.3	.1	.3	.3	1.7	1.2	2.8	1.2
Korea-Panama	9.3	6.9	7.8	11.9	12.2	8.8	8.5	10.7	8.4	3.1	5.6	3.6	4.7	4.7
Others	0.	0.	1.1	.0	0.	0.	1.6	1.8	.5	.6	.2	.3	.1	.1

West Atlantic	14.7	15.7	15.3	14.9	14.5	16.5	13.7	13.4	15.0	14.0	12.9	16.9	25.5	23.0
– Surface.	0.	0.	3.4	2.3	1.6	2.0	.7	1.4	4.7	4.1	5.5	4.8	15.1	15.1
– Longline.	12.8	13.9	11.6	12.4	12.6	14.2	12.6	11.3	9.5	9.0	6.6	11.2	9.7	7.7
China (Taiwan). . . .	3.2	1.0	1.2	1.2	1.3	1.1	1.1	.1	.2	.8	.5	.4	.4	.4
Cuba	.5	.3	.4	0.	.4	.6	1.2	.9	.7	.2	.7	2.0	1.5	.0
Japan	4.3	9.1	4.2	2.5	2.8	2.4	3.1	1.4	1.6	1.7	1.1	3.0	3.3	3.0
Korea-Panama	4.0	3.0	3.3	6.5	6.5	8.9	5.9	7.1	5.0	4.4	2.7	3.6	2.9	2.9
Others	.8	.5	2.6	2.2	1.5	1.1	1.3	1.7	2.0	1.9	1.5	2.3	1.7	1.4
– Uncl. gears	1.9	1.8	.3	.3	.3	.4	.5	.6	.8	1.0	.9	.9	.6	.6
Uncl. region	0.	0.	.1	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.	0.
– Longline.	0.	0.	.1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
– Uncl. gears	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

*Preliminary.

Table 2. Estimated carrying capacity (thousands of MT) of yellowfin and skipjack surface fisheries in the eastern Atlantic Ocean

	1970	*1971*	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*	*1980*	*1981*	*1982*	*1983**
—Baitboat														
FISM	3.4	2.8	2.7	2.1	2.0	1.8	1.5	1.3	1.3	1.4	1.3	1.3	1.3	1.2
Tema-based	1.2	1.6	3.2	4.0	8.7	9.2	7.3	11.0	12.8	11.6	9.7	8.7	8.1	8.0
Canary Islands	.3	.4	.6	1.0	1.9	1.6	.6	.6	.6	.6	.6	.6	.6	.6
Angola			.3					.5	.5	.5	.4	.5	.4	.4
Cape Verde											.2	.2	1.0	1.0
Portugal	.5	.5	.5	.5	.4	.6	.3	.3	.3	.6	.6	.5	.3	.3
TOTAL BAITBOAT	5.4	5.3	7.3	7.6	13.0	13.2	9.7	13.7	15.5	14.7	12.8	11.8	11.7	11.5
—Purse Seine														
FISM	5.8	7.2	9.2	12.4	14.5	17.2	17.5	14.6	17.6	16.5	17.2	16.8	16.3	16.8
Spain	2.7	3.6	5.6	7.5	9.1	14.0	17.2	20.4	24.3	25.2	27.9	27.6	31.5	36.8
U.S.A.	5.4	3.8	11.9	2.9	5.5	10.4	1.7	4.2	10.5	3.2	2.2	1.6	1.3	0.
Japan	1.5	2.0	1.9	1.9	.6	.2							.4	.4
U.S.S.R.	.1	.1	.1	.1	.1	.1	.1	.1	.2	1.0	3.0	3.9	4.9	4.9
Others**	.2	.2	.9	.2	.2	.4	.2	.2	.2	.7	2.9	4.9	10.8	10.2
TOTAL PURSE SEINE	15.7	16.9	29.6	25.	30.	42.3	36.7	39.5	52.8	46.6	53.2	54.8	65.2	69.1
TOTAL BAITBOAT AND PURSE SEINE	21.1	22.2	36.9	32.6	43.	45.5	46.4	53.2	68.3	61.3	66.	66.6	78.9	80.6

*Preliminary.

**Ghana, Mexico, Congo, Gran Cayman, Portugal, Venezuela.

Source: SCRS/83/27

Table 3. Atlantic bigeye catch (1,000 MT)

	1970	*1971*	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*	*1980*	*1981*	*1982*
TOTAL	39.2	52.1	42.8	53.9	59.8	56.5	38.8	46.4	45.4	40.7	58.8	57.6	65.6
North Atlantic	22.6	29.0	22.1	30.0	40.3	38.8	22.6	28.1	26.8	20.3	30.3	29.7	28.9
– Surface	9.6	10.4	7.3	10.9	14.7	14.1	8.6	12.1	13.6	9.5	12.3	9.2	8.4
Baitboat	9.4	10.2	7.2	10.8	14.6	13.7	8.3	10.6	12.9	8.2	9.9	7.2	5.3
FIS	.7	.3	.1	.5	.5	1.2	1.2	2.5	3.6	1.9	2.3	2.1	1.8
Portugal	5.1	2.9	4.0	5.9	10.9	6.8	2.9	4.5	5.4	3.3	3.5	2.6	1.8
Spain	3.6	7.0	3.1	4.4	3.2	5.7	4.2	3.6	3.9	3.0	4.0	2.4	1.5
Others	0.	0.	0.	0.	0.	.0	.0	.1	.2	.0	.0	.0	.1
Purse seine	.3	.2	.1	.1	.1	.4	.3	1.5	.7	.9	2.3	1.4	3.0
FISMP	.2	.1	.1	.1	.1	.3	.1	.9	.4	.7	.1	.2	.2
Spain	.0	.1	.0	.0	.0	.1	.1	.6	.2	.3	1.7	.4	2.4
Others	0.	0.	0.	0.	0.	0.	.0	0.	0.	.0	.4	.7	.3
Other gears	0.	0.	0.	0.	0.	0.	0.	0.	0.	.3	.2	.7	.1
– Longline	13.0	18.6	14.8	19.1	25.6	24.6	14.0	16.1	13.2	10.8	17.9	20.5	20.5
China (Taiwan)	5.1	2.4	.8	1.3	1.1	1.5	.8	1.0	.5	.3	.4	.4	.4
Cuba	2.0	1.2	.8	1.0	.9	.7	.8	1.4	.5	.8	.5	.5	.3
Japan	4.7	13.1	11.8	11.1	17.6	12.4	5.9	5.3	5.8	5.1	11.1	11.4	14.7
Korea-Panama	1.2	1.8	1.4	5.7	5.9	8.5	5.0	6.6	6.3	4.0	5.6	6.2	4.4
USSR	0.	0.	0.	0.	0.	0.	0.	0.	0.	.2	0.	.5	.5
Others	0.	0.	0.	0.	0.	1.5	1.5	1.8	.2	.3	.3	1.5	.3
– Uncl. gears	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0

Table 3. (continued)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
South Atlantic	16.6	23.0	20.7	24.0	19.6	17.7	16.3	18.3	18.6	20.4	28.6	27.9	36.6
– Surface	1.5	2.6	3.0	5.1	6.0	1.5	2.9	5.2	3.6	4.1	5.2	7.1	6.4
Baitboat	.5	.8	1.5	2.4	2.8	.7	1.4	2.1	1.4	1.1	1.0	.7	.3
FIS	.2	.3	.4	.4	.1	0.	0.	0.	0.	0.	0.	0.	0.
Ghana.	0.	0.	0.	.0	.1	.1	.1	.2	.1	.1	.1	.1	.1
Japan	.2	.5	.9	1.7	1.9	.1	.9	1.0	.6	.2	.2	.2	.1
Korea-Panama . . .	0.	0.	.1	.2	.7	.4	.4	.8	.7	.8	.6	.2	0.
Others	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	.1	.3	.2
Purse seine	1.1	1.7	1.5	2.7	3.2	.9	1.1	2.5	2.1	2.8	3.8	6.3	6.0
FISMP	.5	.5	.5	1.8	1.5	.6	.6	1.3	1.1	.7	1.0	.6	1.3
Japan	.3	.5	.7	.3	.2	.0	0.	0.	0.	0.	0.	0.	.0
Spain	.1	.2	.2	.4	.7	.2	.4	.8	.6	1.9	2.6	5.0	4.2
USA.	.2	.5	.2	.1	.9	.1	.0	.3	.2	.2	.1	.1	0.
Others	0.	0.	0.	0.	0.	0.	.0	0.	.1	0.	0.	.5	.5
Other gears	0.	0.	0.	0.	0.	0.	.4	.7	.2	.2	.3	.1	.0
– Longline	15.1	20.5	17.7	18.8	13.5	16.2	13.4	13.0	15.0	16.4	23.4	20.8	30.3
China (Taiwan) . . .	2.4	3.1	4.2	2.5	2.0	2.5	2.5	2.0	2.2	1.9	1.9	1.3	1.5
Cuba	2.1	2.0	1.2	1.6	1.5	1.2	.5	.5	1.8	1.5	.9	.2	.2
Japan	4.3	7.1	6.3	8.8	3.2	5.0	1.4	3.8	3.5	6.8	9.4	9.6	18.2
Korea-Panama . . .	3.5	5.5	4.3	2.8	3.3	3.6	3.7	2.2	4.9	3.8	7.9	7.9	9.2
Others	2.7	2.8	1.6	3.1	3.6	3.9	5.3	4.6	2.6	2.3	3.4	1.8	1.2
– Uncl. gears.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

Uncl. region	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.
– Longline	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
– Uncl. gears	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

Note: FIS suface data were partitioned into N-S by P. Cayré.

Table 4. Estimated population parameters by production model analysis for the Atlantic bigeye tuna stock, 1961-81.

	m	*Degree of fit index*	*f-opt* (10^6 *hooks)*	*Y-max* (10^3 *MT)*	*1979-1981 Catch* (10^3 *MT)*
Whole Atlantic	0	.485 (.506)		114.2 (108.4)	40.7-56.3
	1.001	.488 (.514)	459 (434)	59.7 (57.5)	
	2	.492 (.524)	320 (306)	53.7 (52.2)	
North Atlantic	0	.291		74.1	20.3-30.3
	1.001	.294	305	37.8	
	2	.298	202	32.9	
South Atlantic	0	.586		49.2	20.4-28.6
	1.001	.586	203	26.2	
	2	.576	143	23.7	

NOTE: Figures in parentheses show the estimates based on new effort data.

Table 5. Atlantic skipjack catch (1,000 MT)

	1970	*1971*	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*	*1980*	*1981*	*1982*
TOTAL	*50.7*	*79.6*	*76.7*	*78.6*	*118.8*	*62.0*	*77.2*	*118.1*	*107.9*	*91.0*	*115.6*	*140.2*	*165.7*
– Surface – East Atlantic	47.9	76.8	74.8	75.1	114.4	57.4	73.1	114.6	100.7	84.5	102.3	116.4	131.3
Purse seine	31.1	50.2	50.7	51.3	76.5	37.6	35.2	63.9	59.4	38.6	60.7	75.4	84.8
FIS	8.8	14.2	14.8	8.4	24.0	11.5	16.3	30.9	24.8	17.5	24.1	33.4	33.0
Japan	3.5	6.2	3.4	1.5	.9	.1	0.	0.	0.	0.	0.	0.	1.4
Spain	6.5	12.2	20.2	18.7	31.6	18.1	16.8	27.0	24.9	18.5	28.8	34.0	41.1
U.S.A.	11.8	16.2	12.2	21.2	20.0	7.4	1.8	5.9	6.8	2.1	2.6	2.8	.1
Ghana	0.	0.	0.	.2	0.	.2	.1	0.	0.	0.	.3	2.6	3.8
Portugal	0.	0.	0.	0.	0.	0.	0.	0.	.2	.1	.2	.1	.8
Others	.6	1.4	.2	1.2	.1	.3	.2	.1	2.7	.4	4.7	2.4	4.7
Baitboat	16.7	26.5	23.9	23.7	37.7	15.3	28.3	42.6	40.3	44.6	37.8	38.7	43.7
Angola	.9	1.9	1.5	1.3	3.4	.6	1.5	3.8	3.2	3.6	3.5	2.3	2.2
FIS	4.4	5.8	3.8	3.3	4.5	1.8	2.2	2.7	3.3	3.3	3.1	2.5	4.2
Ghana	0.	0.	0.	.1	.7	1.3	2.1	3.5	2.6	3.9	4.5	4.8	13.6
Japan	7.5	11.7	10.1	13.0	18.7	3.7	15.0	16.8	14.6	14.7	12.3	12.9	8.5
Korea-Panama	0.	0.	.7	1.1	3.1	6.3	4.4	7.6	11.1	13.8	8.5	7.7	5.4
Spain	1.8	2.7	4.1	2.6	5.4	.8	.6	.7	.6	1.3	2.2	4.2	3.4
Portugal	1.0	4.2	3.7	2.2	1.9	.6	2.1	4.4	4.4	3.0	1.7	2.7	4.8
Cape Verde	0.	0.	0.	0.	0.	0.	.3	.9	.5	1.0	2.1	1.6	1.6
Others	1.1	.1	.0	.1	.1	.3	.0	2.2	0.	0.	.0	.1	.0
Other gears	.0	.1	.2	.1	.1	4.5	9.6	8.1	.9	1.4	3.8	2.3	2.7
– Surface – West Atlantic	2.4	2.2	1.4	2.7	3.3	3.4	3.7	3.2	6.6	5.8	12.8	23.0	31.8
Purse seine	0.	0.	1.2	.3	.1	.4	.7	.6	3.5	1.5	2.9	4.7	9.7

Table 5. (Continued)

	1970	*1971*	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*	*1980*	*1981*	*1982*
U.S.A.	0.	0.	.1	0.	0.	.2	.5	.3	1.6	.7	1.0	2.6	.0
Others	0.	0.	1.0	.3	.1	.2	.2	.3	1.8	.8	1.9	2.1	9.7
Baitboat	1.8	1.6	0.	1.9	3.0	2.8	2.8	2.4	2.8	4.0	9.6	18.3	22.0
Brazil	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.4	6.3	13.9	16.0
Cuba	1.8	1.6	0.	1.5	1.8	2.3	2.8	2.4	1.8	2.0	2.3	1.1	1.1
Others	0.	0.	0.	.4	1.2	.5	0.	0.	1.0	.5	1.0	3.3	4.9
Other gears	.6	.6	.2	.5	.3	.2	.2	.2	.3	.3	.3	.1	.1
— Surface — Uncl. region	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LL - Trawl -- All Atl.	.0	.1	.1	.1	.2	.2	.0	.1	.1	.0	.0	.1	.2
— Unclassified gears	.4	.5	.5	.7	.9	1.0	.4	.2	.6	.6	.5	.7	2.5

Table 6. Atlantic albacore catch (1,000 MT)

	1970	*1971*	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*	*1980*	*1981*	*1982*
TOTAL	70.4	83.1	83.4	75.7	72.5	59.4	77.2	75.0	72.1	72.5	60.8	59.2	72.3
North Atlantic	46.2	57.6	49.4	47.0	52.3	41.4	57.3	52.9	48.5	49.7	38.2	34.1	42.0
– Surface	30.1	39.7	34.7	28.8	37.6	28.7	34.3	32.0	34.3	38.1	28.7	24.3	28.8
Baitboat	14.4	15.7	8.2	10.1	16.7	19.2	20.4	15.6	11.7	15.9	16.2	13.4	15.9
France	1.7	1.5	.5	1.1	.6	.7	1.1	.6	.4	.2	.4	.4	.2
Spain	12.5	13.9	7.3	8.2	14.9	17.6	18.7	14.9	11.3	15.6	15.7	12.6	15.3
Others	.2	.3	.4	.9	1.2	.9	.6	.1	.1	.1	.1	.4	.4
Trolling	15.7	24.0	26.5	18.7	21.0	9.5	13.9	16.5	22.6	22.1	12.6	10.8	12.8
France	4.5	7.7	8.7	5.8	7.9	5.0	5.7	6.2	8.4	7.8	3.1	2.5	2.7
Spain	11.3	16.3	17.8	12.9	13.1	4.5	8.2	10.3	14.1	14.2	9.5	8.3	10.1
Others	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Other gears	0.	0.	0.	0.	0.	0.	0.	0.	0.	.1	.0	.1	.1
– Longline	16.1	17.9	14.7	18.1	14.6	12.7	23.0	20.9	14.2	11.6	9.5	9.8	13.2
China (Taiwan)	4.7	2.9	4.4	9.5	9.5	8.1	14.8	13.7	9.3	7.0	7.1	6.6	10.5
Japan	5.9	6.5	1.3	1.5	2.1	1.3	1.3	.8	.5	1.2	1.0	1.7	.8
Korea-Panama	5.0	7.7	8.2	7.2	3.0	3.1	6.6	6.1	3.8	3.4	1.0	1.1	1.8
Others	.5	.8	.8	0.	0.	.2	.2	.2	.5	.0	.4	.4	.1

Table 6. (continued)

	1970	*1971*	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*	*1980*	*1981*	*1982*
South Atlantic	23.7	25.0	33.3	28.2	19.7	17.5	19.2	21.3	23.0	22.3	22.1	23.6	29.0
– Surface	0.	0.	.1	.1	.1	.2	.0	.3	.2	.5	1.5	3.3	3.7
– Longline	23.7	25.0	33.2	28.1	19.6	17.4	19.2	21.0	22.8	21.8	20.6	20.3	25.3
China (Taiwan). . .	12.2	17.5	25.0	22.2	16.7	13.4	14.6	16.1	20.5	20.3	18.7	18.2	22.8
Japan	5.9	3.2	2.1	.3	.1	.3	.1	.1	.1	.1	.3	.6	.6
Korea-Panama . . .	5.0	3.8	5.8	5.6	2.6	3.5	4.1	4.1	1.7	1.0	.9	.8	.8
Others	.5	.5	.3	.1	.2	.2	.3	.6	.5	.4	.7	.8	1.1
Mediterranean.	.6	.5	.7	.5	.5	.5	.6	.6	.6	.5	.5	1.5	1.3
Uncl. region	0.	0.	0.	.0	0.	.0	.1	.2	.1	.0	.0	.0	.0
– Surface	0.	0.	0.	.0	0.	.0	0.	.0	.1	.0	.0	.0	.0
– Longline	0.	0.	0.	0.	0.	0.	.1	.2	.0	0.	0.	0.	0.
Uncl. gears	0.	0.	.0	0.	.0	0.	0.	0.	.0	0.	.0	0.	.0

Table 7-A. Bluefin catches (hundreds of MT) as reported in last three years

Year of catch	*Year reported*	*EAST ATLANTIC*			*MEDITERRANEAN*			*WEST ATLANTIC*			*TOTAL ATLANTIC*		
		Small	*Large*	*Total*	*Small*	*Large*	*Total*	*Small*	*Large*	*Total*	*Small*	*Large*	*Total*
	1981	26	31	57	18	31	49	38	20	58	82	82	164
1970	1982	26	30	56	13	32	45	36	21	57	75	82	158
	1983	26	30	56	13	35	48	36	21	57	75	85	161
	1981	22	21	43	37	29	66	37	34	71	96	84	180
1971	1982	22	21	43	32	30	62	34	35	69	88	86	174
	1983	22	23	46	33	30	62	34	34	69	89	88	177
	1981	34	23	57	29	24	53	20	20	40	83	67	150
1972	1982	34	23	57	24	26	50	17	19	36	75	68	143
	1983	34	20	55	33	26	58	17	23	41	84	69	154
	1981	27	19	46	34	23	57	16	22	38	77	64	141
1973	1982	27	19	46	27	26	53	15	23	38	69	68	137
	1983	27	19	47	33	27	60	15	25	41	25	75	147
	1981	22	37	58	57	70	124	12	21	33	91	124	215
1974	1982	22	37	59	51	70	121	12	21	33	85	128	213
	1983	22	39	61	51	70	121	12	23	35	85	132	217
	1981	43	56	99	45	66	111	23	29	52	111	151	262
1975	1982	43	54	97	40	71	111	22	28	52	105	153	268
	1983	43	56	100	40	71	111	22	30	52	105	157	263
	1981	13	45	58	99	62	161	14	42	56	126	149	275
1976	1982	13	39	52	94	70	164	14	44	58	121	153	274
	1983	13	39	52	100	71	171	14	46	60	127	156	283
	1981	23	47	70	59	60	119	14	52	66	96	159	255
1977	1982	23	47	70	55	62	117	14	53	67	96	162	254
	1983	23	47	70	56	62	118	14	54	68	92	163	256

Table 7-A. (continued)

Year of catch	*Year reported*	*EAST ATLANTIC*			*MEDITERRANEAN*			*WEST ATLANTIC*			*TOTAL ATLANTIC*		
		Small	*Large*	*Total*	*Small*	*Large*	*Total*	*Small*	*Large*	*Total*	*Small*	*Large*	*Total*
	1981	23	60	83	52	26	78	12	44	56	87	130	217
1978	1982	23	30	53	52	35	87	12	45	57	87	110	197
	1983	23	35	58	54	35	88	12	47	59	89	117	205
	1981	16	48	64	63	35	98	12	48	60	91	131	222
1979	1982	16	22	38	36	41	77	11	51	62	64	114	178
	1983	16	32	48	33	41	73	11	55	65	60	128	185
	1981	13	34	47	40	40	80	6	46	52	59	120	179
1980	1982	16	24	40	41	45	86	7	51	58	63	120	183
	1983	16	27	41	40	48	89	7	52	59	63	124	189
	1981												
1981	1982	10	21	31	55	35	90	14	46	60	79	120	181
	1983	10	22	33	59	40	98	9	50	59	78	112	191
	1981												
1982	1982												
	1983	15	43	58	83	37	120	2	10	12	100	90	190

Table 7-B. Atlantic bluefin tuna catch (1,000 MT)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
TOTAL	*16.1*	*17.7*	*15.4*	*14.7*	*21.7*	*26.3*	*28.3*	*25.6*	*20.5*	*18.5*	*18.9*	*19.1*	*22.2*
West Atlantic	5.7	6.9	4.1	4.1	3.5	5.2	6.0	6.8	5.9	6.5	5.9	5.9	1.4
Small fish	3.6	3.4	1.7	1.5	1.2	2.2	1.4	1.4	1.2	1.1	.7	.9	.2
—Purse seine	3.5	3.3	1.6	1.5	.9	2.1	1.4	1.4	1.2	1.0	.6	.9	.2
Canada	1.2	.9	.3	.6	.1	.3	.3	.3	.2	0.	0.	.1	0.
U.S.A.	2.3	2.4	1.3	.8	.8	1.8	1.1	1.1	.9	1.0	.6	.8	.2
—Rod & Reel	.1	.1	.1	.0	.3	.1	.0	.1	.1	.1	.1	0.	0.
U.S.A.	.1	.1	.1	.0	.3	.1	.0	.1	.1	.1	.1	0.	0.
Large fish	2.0	3.3	2.2	2.3	2.1	2.8	4.4	5.3	4.5	5.1	5.1	4.8	1.1
—Purse seine	.8	.5	.4	.2	.1	.3	.2	.2	.1	.4	.1	0.	0.
U.S.A.	.8	.5	.4	.2	.1	.3	.2	.2	.1	.4	.1	0.	0.
—Rod & Reel	.5	1.0	1.0	.5	.6	.2	.6	.6	.4	.4	.4	.5	.2
Canada	.2	.1	.2	.2	.4	.2	.3	.3	.2	.2	.3	.3	0.
U.S.A.	.4	.8	.8	.2	.1	0.	.2	.3	.2	.2	.2	.2	.2
—Longline	.3	1.5	.3	1.1	.9	1.5	3.1	3.8	3.2	3.7	4.0	3.9	.4
Japan	.1	1.4	.3	1.1	.9	1.5	2.9	3.7	3.1	3.6	3.9	3.8	.3
Others	.2	.1	.0	.0	.0	.0	.2	.1	.1	.1	.0	.1	.1
—Other gears	.5	.4	.5	.5	.5	.8	.6	.8	.8	.7	.6	.4	.5
Canada	.3	.1	0.	.1	.3	.1	.2	.4	.2	.0	.1	.0	.3
U.S.A.	.2	.3	.5	.4	.3	.7	.4	.4	.6	.6	.5	.4	.2
—Unclassified gears	.1	.1	.1	.2	.2	.2	.2	.1	.2	.2	.1	.2	.1
East Atlantic	5.6	4.6	5.5	4.7	6.1	10.0	5.2	7.0	5.8	4.8	4.1	3.3	6.3
Small fish	2.6	2.2	3.4	2.7	2.2	4.3	1.3	2.3	2.3	1.6	1.6	1.1	1.5
—Baitboat	2.2	2.2	2.9	2.2	1.6	1.7	.9	1.6	2.3	1.4	1.5	1.0	.9
France	.7	.7	.7	.5	.5	.7	.3	.6	.7	.3	.3	.2	.2

Table 7-B. (Continued)

	1970	*1971*	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*	*1980*	*1981*	*1982*
Spain	1.5	1.5	2.1	1.7	1.1	1.0	.7	1.0	1.6	1.1	1.2	.9	.7
—Purse seine	.4	.0	.5	.5	.6	2.6	.3	.7	.0	.2	.2	.1	.6
Morocco	.4	.0	.5	.5	.6	2.6	.3	.7	.0	.2	.2	.1	.6
—Unclassified gears	.0	.1	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Large fish	3.0	2.3	2.0	1.9	3.9	5.6	3.9	4.7	3.5	3.2	2.4	2.2	4.8
—Purse seine	.3	.6	.4	.4	.9	1.0	.5	.8	.2	.1	.3	.2	.1
Norway	.3	.6	.4	.4	.9	1.0	.5	.8	.2	.1	.3	.2	.1
—Baitboat	.7	.8	.9	.9	.7	1.3	.9	1.3	1.6	.8	.4	.5	.1
Portugal	0.	0.	0.	0.	.2	.3	.0	.0	.1	.0	.0	.0	.0
Spain	.7	.8	.9	.9	.5	1.0	.8	1.3	1.5	.8	.4	.5	.0
—Trap	1.8	.7	.4	.5	.0	.4	.5	.6	.5	.6	.7	.8	1.9
Morocco	.3	.1	.1	.0	.0	0.	0.	.2	0.	0.	0.	0.	0.
Spain	1.5	.6	.3	.5	.0	.4	.5	.3	.5	.6	.7	.8	1.9
—Longline	.3	.3	.3	.1	2.2	2.9	2.0	1.8	.7	.7	1.0	.6	2.7
Spain	0.	0.	0.	0.	0.	.0	0.	0.	0.	.1	0.	.0	.1
Japan	.0	.2	.2	.0	2.2	2.9	2.0	1.6	.6	.6	.9	.5	2.6
Others	.3	.1	.0	.0	.0	.0	.1	.2	.2	.0	.1	.1	.0
—Other gears	0.	0.	0.	.0	0.	0.	0.	.3	.5	1.0	.0	.1	.0
Unclassified region	0.	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
—Longline	0.	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
China (Taiwan)	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Korea	0.	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Panama	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Cuba	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Others	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

Mediterranean	4.8	6.2	5.8	6.0	12.1	11.1	17.1	11.8	8.8	7.3	8.9	9.9	14.5
Small fish	1.3	3.2	3.2	3.2	5.1	4.0	10.0	5.6	5.4	3.3	4.0	5.9	8.7
—Purse seine	1.2	3.1	3.1	3.1	5.0	3.9	9.9	5.4	5.2	3.1	4.0	5.7	8.6
France	1.1	2.2	1.1	1.4	1.8	1.6	3.8	3.2	1.6	1.5	1.7	2.3	4.8
Italy	0.	.5	1.8	1.5	2.9	2.1	5.5	1.3	2.6	.8	1.8	3.0	3.3
Morocco	0.	.0	.0	0.	.0	.0	.0	.0	0.	.0	0.	.0	0.
Yugoslavia	.1	.3	.2	.2	.3	.2	.6	.9	1.0	.7	.5	.4	.5
—Other gears	.1	.1	.1	.1	.1	.1	.1	.2	.2	.1	.0	.2	.2
Italy	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	0.	.1	.1
Spain	0.	0.	0.	0.	0.	.0	0.	.1	.1	.0	.0	.1	.1
Large fish	3.5	3.1	2.6	2.8	7.0	7.1	7.1	6.2	3.5	4.1	4.9	4.0	5.8
—Purse seine	1.2	.8	1.0	1.2	3.1	4.2	4.1	4.2	2.1	2.9	3.4	1.7	2.2
Italy	1.2	.8	1.0	1.2	3.1	4.2	4.1	4.2	2.1	2.9	3.4	1.7	2.2
—Trap	2.0	2.0	1.3	1.0	1.4	1.5	1.5	1.2	1.0	.7	.7	.6	.6
Italy	1.0	1.0	.8	.4	.7	.7	.7	.7	.2	.2	.2	.2	.2
Libya	.5	.6	.3	.4	.5	.6	.8	.3	.7	.4	.4	.3	.3
Morocco	0.	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.
Spain	.3	.1	.1	.1	.0	.0	.0	.0	.0	0.	0.	.0	.1
Tunisia	.2	.2	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
—Longline	.1	.1	.2	.5	2.4	1.4	1.2	.6	.2	.2	.2	.3	1.5
Spain	.1	.1	.1	.3	.2	.1	.3	.1	.1	.1	.1	.2	.5
Japan	0.	0.	.1	.2	2.2	1.3	1.0	.5	.1	.1	.1	.1	1.0
Others	0.	0.	0.	0.	0.	.0	0.	.0	0.	0.	0.	0.	0.
—Other gears	.2	.1	.1	.1	.1	.1	.3	.3	.2	.3	.6	1.4	1.5

Table 8. Catch of bluefin tuna (in 1,000 fish)

	1960	*1961*	*1962*	*1963*	*1964*	*1965*	*1966*	*1967*	*1968*	*1969*	*1970*
East Atlantic											
No. of fish < 120 cm	785	1023	586	767	706	356	738	738	206	344	221
No. of fish ≥ 120 cm	122	111	154	53	48	55	40	42	26	23	32
TOTAL NO. OF FISH	907	1134	740	820	755	412	778	780	232	366	254
West Atlantic											
No. of fish < 120 cm	2	6	69	151	112	251	258	157	58	72	321
No. of fish ≥ 120 cm	10	18	80	156	148	100	39	29	14	14	28
TOTAL NO. OF FISH	12	24	149	307	260	351	296	186	72	87	349
Mediterranean											
No. of fish < 120 cm	18	42	229	1154	80	34	518	742	785	111	68
No. of fish ≥ 120 cm	32	38	32	33	39	31	38	51	49	49	32
TOTAL NO. OF FISH	51	80	261	1188	119	65	556	793	835	160	99

Table 8. (continued)

	1971	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*	*1980*	*1981*
East Atlantic											
No. of fish < 120 cm	89	206	207	243	793	150	292	226	117	152	167
No. of fish ≥ 120 cm	31	38	24	29	38	22	26	28	32	20	16
TOTAL NO. OF FISH	120	244	231	272	832	172	318	254	149	172	183
West Atlantic											
No. of fish < 120 cm	327	196	123	114	238	103	48	42	33	29	62
No. of fish ≥ 120 cm	32	16	20	27	22	21	47	33	38	35	37
TOTAL NO. OF FISH	358	212	143	140	261	125	95	75	71	64	99
Mediterranean											
No. of fish < 120 cm	259	201	185	299	407	533	566	481	190	291	435
No. of fish ≥ 120 cm	29	18	25	75	51	73	39	20	25	32	38
TOTAL NO. OF FISH	288	219	210	374	458	606	605	500	214	323	473

Table 9. Proportion of undersized fish in bluefin tuna catches

	CATCHES (X 10^2 MT)			CATCHES (X 10^3 N)		
	Small fish (< 120 cm)	*Large fish (≥ 120 cm)*	*TOTAL*	*TOTAL*	*< 6.4 kg (%)*	*REGULATIONS*
1975						
East	43	56	100	831	625 (75)	6.4 kg size limit; F to recent levels
Medi	40	71	111	458	211 (46)	" "
West	22	30	52	261	50 (19)	" "
Total	105	157	263	1550	886	
1976						
East	13	39	52	171	79 (46)	" "
Medi	100	71	171	606	107 (18)	" "
West	14	46	60	125	6 (5)	" "
Total	127	156	283	902	192	
1977						
East	23	47	70	318	163 (51)	" "
Medi	56	62	118	606	313 (52)	" "
West	14	54	68	95	2 (2)	" "
Total	93	163	256	1419	478	
1978						
East	23	35	58	254	129 (50)	" "
Medi	54	35	88	500	195 (39)	" "
West	12	47	59	75	6 (8)	" "
Total	89	117	205	829	330	

1979						
East	16	32	48	148	59 (40)	6.4 kg size limit; F to recent levels
Medi	33	41	73	215	55 (26)	" "
West	11	55	65	71	3 (4)	" "
Total	60	128	185	434	117	
1980						
East	16	24	41	172	98 (57)	" "
Medi	40	48	89	323	67 (21)	" "
West	7	52	59	63	2 (4)	" "
Total	63	124	189	558	167	
1981						
East	10	22	33	183	115 (63)	" "
Medi	59	40	98	473	56 (12)	" "
West	9	50	59	99	7 (7)	" "
Total	78	112	191	755	179	
1982						
East	15	43	58			" "
Medi	83	37	120			" "
West	2	10	12			6.4 kg size limit; F to recent levels;total quota 1,160 MT
Total	100	90	190			
1983						
East	?	?	?			6.4 kg size limit; F to recent levels
Medi	?	?	?			" "
West	?	?	27*			6.4 kg size limit; F to recent levels;total quota 2,660 MT
Total						

*Quota approved for 1983.

Table 10. Proportion of undersized bluefin, in number

Undersized catches	*Before regulation*					*After regulation*					
	1971	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*	*1980*	*1981*
East Atlantic											
n < 6.4 kg	8,422	107,496	139,635	138,604	624,865	78,855	163,011	128,662	59,417	97,846	115,315
N-TOT	120,118	243,968	230,539	271,906	831,364	170,994	317,586	254,193	148,469	171,720	132,570
Percentage	7.0	44.1	60.6	51.0	75.2	46.1	51.3	50.6	40.0	57.0	63.2
West Atlantic											
n < 6.4 kg	8,746	52,170	6,626	62,305	49,632	5,725	1,532	5,632	2,714	2,209	6,788
N-TOT	358,471	211,797	143,174	140,493	260,543	124,592	94,645	74,986	71,089	63,509	98,827
Percentage	24.5	24.6	4.6	44.3	19.0	4.6	1.6	7.5	3.8	3.5	6.9
Mediterranean											
n < 6.4 kg	193,032	39,250	97,057	182,679	211,408	107,297	312,551	194,844	55,010	67,195	55,856
N-TOT	287,991	219,518	209,840	374,263	458,474	606,342	605,759	500,485	214,970	323,468	473,102
Percentage	19.4	17.9	46.3	48.8	46.1	17.7	51.6	38.9	25.6	20.8	11.8

Table 11. Blue marlin landings (MT), effective fishing intensity (1,000 hooks per 5° area) for Japanese fleet (FJPN), and entire fleet (FTOT), index of abundance (UJPN), and ratio of Japanese catch to total catch (°/o JPN) in the total Atlantic Ocean, 1957-1980.

Year	Japan	USA	USSR	China (Taiwan)	Cuba	Korea	Vene-zuela	Argen-tina	Brazil	Panama	Brazil-Korea	Brazil-Japan	Gre-nada	Total	FJPN	FTOT	UJPN	°/o JPN
1957	764													764	27.0	27.	28.30	1.00
1958	772													772	58.6	59.	13.17	1.00
1959	841													841	132.0	132.	6.37	1.00
1960	2712	103												2815	167.3	174.	16.21	0.96
1961	3768	116					152		41					4077	163.7	177.	23.02	0.92
1962	7044	115		20			99		24					7302	503.1	522.	14.00	0.96
1963	8600	128		48	145		101		12					9034	654.7	688.	13.14	0.95
1964	7590	161	1	13	154	2	74		12					8007	866.7	914.	8.76	0.95
1965	5751	163	4	4	176	7	36		12					6153	709.2	759.	8.11	0.93
1966	3370	149	6	69	118	93	35		12					3852	416.2	476.	8.10	0.87
1967	1073	197	16	291	444	145	62		6					2234	192.6	401.	5.57	0.48
1968	946	168	15	722	280	186	96		15					2428	156.3	401.	6.05	0.39
1969	960	207	16	1364	165	312	43		18					3085	194.5	625.	4.94	0.31
1970	1005	204	14	929	149	488	30		39					2858	194.2	552.	5.18	0.35
1971	1395	179	17	762	166	479	178		21					3197	383.2	878.	3.64	0.44
1972	420	191	43	928	89	466	188		26	22				2373	135.1	763.	3.11	0.18
1973	346	209	62	692	298	989	124		8	452				3180	90.9	835.	3.81	0.11
1974	284	234	9	552	686	834	83		16	134				2832	74.7	745.	3.80	0.10
1975	608	241	18	527	789	658	82		12	95				3030	194.2	968.	3.13	0.20
1976	264	265	1	409	409	566	78		33	154	10			2189	111.3	923.	2.37	0.12
1977	135	295	10	171	320	663	79		52	190	29	113	?	2057	57.9	882.	2.33	0.07
1978	114	295	5	258	210	325	93		14	74	0	24	?	1412	28.5	353.	4.00	0.08
1979	336	295	44	190	336	145	132		25	13	0	3		1347	39.1	321.	4.19	0.12
1980	336	295	0	289	336	137	79		12	0	0	8		1492	79.3	352.	4.24	0.23

Source: SCRS/82/70

Table 12. Blue marlin landings (MT), effective fishing intensity (1,000 hooks per 5° area) for Japanese fleet (FJPN), and entire fleet (FTOT), index of abundance (UJPN), and ratio of Japanese catch to total catch (°/o JPN) in the North Atlantic Ocean, 1957-1980.

Year	Japan	USA	USSR	China (Taiwan)	Cuba	Korea	Vene-zuela	Argen-tina	Brazil	Panama	Brazil-Korea	Brazil-Japan	Gre-nada	Total	FJPN	FTOT	UJPN	°/oJPN
1957	91													91	5.1	5.	17.84	1.00
1958	240													240	48.0	48.	5.00	1.00
1959	231													231	76.9	77.	3.00	1.00
1960	581	103												684	78.9	93.	7.36	0.85
1961	379	116					152							647	42.8	73.	8.86	0.59
1962	3223	115		9			99							3146	310.9	332.	10.37	0.94
1963	4759	128		27	123		101							5133	539.9	583.	8.81	0.93
1964	4434	161		8	128	1	74							4806	825.0	894.	5.37	0.92
1965	3330	163	1	2	144	4	36							3680	639.9	707.	5.20	0.90
1966	1677	149	1	34	91	46	35							2033	331.5	402.	5.06	0.82
1967	485	197	3	131	223	66	62							1167	139.1	335.	3.49	0.42
1968	474	168	3	337	167	93	96							1338	133.9	378.	3.54	0.35
1969	658	207	3	348	122	214	43							1595	203.3	493.	3.24	0.41
1970	758	204	2	369	108	368	30							1839	231.9	563.	3.27	0.41
1971	1223	179	3	158	149	221	178							2111	537.5	923.	2.28	0.58
1972	335	191	7	300	67	215	188			10				1313	177.7	696.	1.89	0.26
1973	229	209	10	155	223	457	124			208				1615	108.7	767.	2.11	0.14
1974	267	234	1	183	516	385	83			62				1731	110.6	717.	2.41	0.15
1975	551	241	3	105	594	304	82			44				1924	280.3	979.	1.97	0.29
1976	260	265	0	169	250	174	78			47				1243	169.1	803.	1.54	0.21
1977	118	295	1	64	220	307	79			87			?	1171	82.5	819.	1.43	0.10
1978	99	295	1	81	97	185	93			42			?	893	33.9	351.	2.54	0.11
1979	98	295	7	51	156	67	132			6				812	39.8	330.	2.46	0.12
1980	223	295	0	160	156	45	79			0				958	70.3	302.	3.17	0.23

Source: SCRS/82/70.

Table 13. White marlin landings (MT), effective fishing intensity (1,000 hooks per 5° area) for Japanese fleet (FJPN) and entire fleet (FTOT), index of abundance (UJPN), and ratio of Japanese catch to total catch (°/o JPN) in the total Atlantic Ocean, 1957-1980.

Year	Japan	USA	USSR	China (Taiwan)	Cuba	Korea	Vene-zuela	Argen-tina	Brazil	Panama	Brazil-Korea	Brazil-Japan	Gre-nada	Total	FJPN	FTOT	UJPN	°/oJPN
1957	160													160	9.2	9.	17.39	1.00
1958	161													161	30.3	30.	5.31	1.00
1959	112													112	115.4	115.	0.97	1.00
1960	253	60												313	111.8	138.	2.26	0.81
1961	692	60					11		60					823	93.8	112.	7.38	0.84
1962	1915	74		6			30		34					2059	392.1	422.	4.88	0.93
1963	2418	64		14	44		55		17					2612	394.6	426.	6.13	0.93
1964	3495	70		6	62	3	78		17					3731	963.3	1028.	3.63	0.94
1965	4631	76	2	4	102	8	63		17					4903	652.4	691.	7.10	0.94
1966	3002	76	2	61	141	109	93		17					3501	461.8	539.	6.50	0.86
1967	668	81	7	181	194	169	104	3	9					1416	189.6	402.	3.52	0.47
1968	1088	87	7	385	118	209	107	14	21					2036	214.6	402.	5.07	0.53
1969	843	76	7	568	65	381	268	0	24					2332	158.2	419.	5.33	0.38
1970	703	104	4	566	69	570	15	0	54					2085	223.6	663.	3.14	0.34
1971	980	95	7	438	49	560	82	20	15					2246	242.9	557.	4.03	0.44
1972	440	99	16	713	40	515	258	100	94	26				2331	132.1	700.	3.33	0.19
1973	355	104	24	532	133	271	170	57	10	123				1779	84.5	423.	4.20	0.10
1974	390	108	3	527	304	229	114	0	36	36				1747	74.3	333.	5.25	0.22
1975	418	107	7	349	100	180	113	0	31	26				1570	142.7	536.	2.93	0.27
1976	543	109	0	519	106	284	107	2	56	76	8			1810	110.8	369.	4.90	0.30
1977	106	109	3	163	124	182	108	2	15	51	19	76	?	958	57.1	516.	1.86	0.11
1978	129	109	2	276	170	38	127	0	22	9	0	120	?	1002	38.8	301.	3.32	0.13
1979	110	109	16	217	273	40	181	0	21	3	0	93		1063	35.3	341.	3.12	0.10
1980	125	109	0	250	273	37	110	0	35	0	0	21	0	960	77.5	595.	1.61	0.13

Source: SCRS/82/70.

Table 14. White marlin landings (MT), effective fishing intensity (1,000 hooks per 5° area) for Japanese fleet (FJPN) and entire fleet (FTOT), index of abundance (UJPN), and ratio of Japanese catch to total catch (°/o JPN) in the North Atlantic Ocean, 1957-1980.

Year	Japan	USA	USSR	China (Taiwan)	Cuba	Korea	Vene-zuela	Argen-tina	Brazil	Panama	Brazil-Korea	Brazil-Japan	Gre-nada	Total	FJPN	FTOT	UJPN	°/oJPN
1957	25													25	3.3	3.	7.58	1.00
1958	62													62	41.0	41.	1.51	1.00
1959	16													16	95.4	95.	0.17	1.00
1960	25	60												85	45.8	156.	0.55	0.29
1961	30	60					11							101	22.8	77.	1.32	0.30
1962	271	74		1			30							376	173.1	240	1.57	0.72
1963	754	64		4	35		55							912	357.2	432.	2.11	0.83
1964	1493	70		3	45	1	78							1690	884.7	1001.	1.69	0.88
1965	1913	76		2	69	1	63							2124	527.5	586.	3.63	0.90
1966	1417	76		32	118	51	93							1787	419.9	530.	3.37	0.79
1967	174	81	1	47	127	44	104							578	131.3	436.	1.33	0.30
1968	273	87	1	58	103	52	107							681	122.4	305.	2.23	0.40
1969	451	76	1	132	58	204	268							1190	144.2	380.	3.13	0.39
1970	419	104	0	97	61	310	15							1036	212.8	526.	1.97	0.40
1971	915	95	1	178	45	219	82							1535	399.9	671.	2.29	0.60
1972	339.	99	1	244	34	213	258			10				1198	100.4	638.	1.88	0.28
1973	328	104	2	120	112	106	170			48				990	133.8	404.	2.45	0.33
1974	381	108	0	248	256	90	114			14				1211	127.4	405.	2.99	0.31
1975	404	107	1	84	294	71	113			10				1084	236.1	633.	1.71	0.37
1976	540	109	0	142	68	64	107			17				1047	191.6	371.	2.82	0.52
1977	80	109	0	44	67	71	108			20			?	499	92.8	579.	0.86	0.16
1978	115	109	0	79	43	33	127			8			?	514	61.2	274	1.88	0.22
1979	95	109	1	62	68	16	181			1				533	53.2	298.	1.79	0.18
1980	118	109	0	105	68	12	110			0				522	120.7	534.	0.98	0.23

Source: SCRS/82/70.

Table 15. Atlantic billfish catch (1,000 MT)

	1970	*1971*	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*	*1980*	*1981•*	*1982**
TOTAL	7.7	8.3	7.2	6.6	5.9	5.8	5.5	4.9	4.9	5.6	4.9	5.2	5.7
Argentina	0.	.0	.1	.1	0.	0.	.0	.0	0.	0.	0.	0.	0.
Barbados	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.1	.1	.1
Benin	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	.1
Brazil	.1	.1	.2	.1	.1	.1	.3	.3	.2	.2	.2	.2	.2
Brazil-Japan	0.	0.	0.	0.	0.	0.	0.	.2	.2	.1	.0	.0	.1
Brazil-Korea	0.	0.	0.	0.	0.	0.	.0	.1	0.	0.	0.	0.	0.
Cape Verde	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0
China (Taiwan)	2.0	2.0	2.4	1.8	1.3	.9	1.2	.4	.6	.4	.6	.6	.7
Cuba	.3	.3	.2	.5	1.2	1.4	.7	.6	.5	.8	.8	.9	1.0
Dom. Republic	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0
France	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.2	.2
Gabon	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.1	0.
Ghana	0.	0.	0.	.0	.0	.0	.0	.6	1.6	2.2	1.2	.4	.0
Grenada	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	.0	.0	.1
Japan	2.3	2.8	1.1	.8	.8	1.2	.9	.3	.1	.2	.5	.7	1.4
Korea	1.8	1.8	1.8	1.4	1.2	.9	1.0	1.0	.4	.2	.2	.3	.2
Dutch Antilles	.0	.0	.0	.0	.0	.0	.0	.0	.1	.1	.1	.1	.1
Panama	0.	0.	.1	.6	.2	.1	.3	.3	.1	.0	0.	0.	0.
Portugal	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0
Senegal	.1	.1	.1	.1	.1	.1	.2	.2	.2	.1	.3	.5	.6
South Africa	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	0.	0.
Spain	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0
USA	.5	.5	.5	.6	.6	.6	.6	.7	.7	.7	.7	.7	.7
Uruguay	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	.0
USSR	.0	.0	.1	.1	.0	.0	.0	.0	.0	.1	0.	.0	0.
Venezuela	.5	.6	.5	.4	.3	.3	.2	.2	.3	.4	.2	.3	.2

Table 15. (continued)

	1970	*1971*	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*	*1980*	*1981*	*1982**
Species breakdown													
Blue marlin	2.9	3.2	2.4	3.2	2.8	3.0	2.2	2.1	1.4	1.3	1.5	1.6	2.4
Black marlin.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	.0	.0
White marlin.	2.1	2.2	2.3	1.8	1.7	1.6	1.8	1.0	.9	1.0	.9	1.2	1.1
Sailfish	2.8	2.8	2.5	1.6	1.3	1.2	1.5	1.9	2.6	3.2	2.4	2.1	2.0
Uncl. billfishes . . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	.1	.3	.2

*Preliminary.

Table 16. Summary of billfish data reported to ICCAT by country

	1971	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*	*1980*	*1981*
A) TASK I – TOTAL CATCH											
Brazil	2	2	2	2	3	3	3	3	3	3	3
Cuba	1	1	1	1	1	1	1	1	1	1	1
Ghana	1	1	1	1	4	4	4	4	4	4	4
Japan	3	3	3	3	3	3	3	3	3	3	3
Korea	2	2	2	2	2	2	2	2	2	2	2
Senegal	4	4	4	4	4	4	4	4	4	4	4
Taiwan	2	2	2	2	2	2	2	2	3	3	3
U.S.A.	4	4	4	4	4	4	4	4	4	4	4
B) TASK II – CATCH/EFFORT											
Brazil	1	3	3	2	2	2	2	3	3	3	3
Cuba	1	1	1	1	1	1	1	1	1	1	1
Ghana	1	1	1	1	1	1	1	1	1	1	1
Japan	3	3	3	3	3	3	3	3	3	3	3
Korea	1	1	1	1	1	2	2	2	2	2	2
Senegal	4	4	4	4	4	4	4	4	4	4	4
Taiwan	3	3	3	3	3	3	3	3	3	2	2
U.S.A.	4	4	4	4	4	4	4	4	4	4	4

Table 16. (Continued)

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
C) TASK II – SIZE FREQUENCY											
Brazil	5	5	5	5	5	5	5	5	5	5	5
Cuba	5	5	5	5	5	5	5	5	5	5	5
Ghana	5	5	5	5	5	5	5	5	5	5	5
Japan	6	7	7	7	7	7	7	7	7	7	7
Korea	5	5	5	6	6	5	5	5	5	5	5
Senegal*	5	5	5	5	5	5	5	5	5	7	7
Taiwan	5	5	5	5	5	5	5	5	5	7	7
U.S.A.	7	7	7	7	7	7	7	7	7	7	7

1 - No report of billfish species caught, or no separation of species.
2 - Billfish species reported and separated, but one or more species missing.
3 - Complete list of billfish species caught, except that sailfish and spearfish are combined.
4 - Complete list of all billfish species caught.
5 - No size frequencies for any billfish species caught.
6 - Size frequencies missing for one or more billfish species taken.
7 - Size frequencies available for all billfish species taken.

*Size frequency data from Senegal, 1980-81, are not in the ICCAT data base, but were provided by P. Cayré at the 1983 SCRS Meeting.

Table 17. Atlantic swordfish catch (1,000 MT)

	1970	*1971*	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*	*1980*	*1981*	*1982*
TOTAL	17.7	11.8	12.6	13.2	13.4	13.6	13.0	13.4	18.5	18.0	20.6	16.0	21.5
Atlantic	14.6	7.1	7.1	8.8	8.8	9.7	8.8	8.5	13.1	13.0	15.2	11.2	16.4
Argentina	.4	.1	.1	.0	.0	.0	.1	.1	.0	0.	0.	0.	.0
Benin	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	.0
Brazil	.2	.1	.1	.1	.3	.3	.4	.3	.1	.2	1.1	.4	.6
Brazil-Japan	0.	0.	0.	0.	0.	0.	0.	.0	.1	.1	.3	.2	.3
Brazil-Korea	0.	0.	0.	0.	0.	0.	.0	.0	0.	0.	0.	0.	0.
Bulgaria	0.	0.	0.	0.	0.	0.	0.	.0	0.	0.	0.	0.	0.
Canada	4.8	0.	0.	0.	0.	.0	.0	.1	2.3	3.0	1.9	.6	.6
China (Taiwan)	1.2	.8	.7	1.1	.8	.9	.9	.7	.6	1.3	.6	.5	.6
Cuba	.3	.2	.1	.5	1.1	.5	.6	.7	.6	.4	.6	.4	.7
France	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	0.	0.
Ghana	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.1	.0	0.
Ireland	0.	0.	0.	0.	0.	.0	.0	0.	0.	0.	0.	0.	0.
Italy	0.	0.	0.	0.	0.	0.	0.	0.	.0	0.	0.	0.	0.
Japan	3.2	1.6	1.8	1.0	1.4	1.5	.8	.8	.9	1.0	2.1	2.2	3.7
Korea	.4	.4	.4	1.0	.7	.5	1.1	1.2	1.3	.6	.7	.4	.7
Liberia	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	.0	.0
Martinique	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Mexico	0.	0.	.0	.0	.0	0.	0.	0.	.0	0.	0.	0.	0.
Morocco	.0	.0	.0	.0	.0	.0	.0	.0	.0	.2	.1	.1	.1
Norway	.4	.2	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Panama	0.	0.	.0	.4	.1	.1	.3	.1	.2	.1	0.	0.	0.
Poland	0.	0.	0.	.1	0.	0.	0.	0.	.0	0.	.0	0.	0.
Portugal	.0	.0	.0	.0	.1	.1	.0	.0	.0	.0	.0	.0	.0
Rumania	0.	0.	0.	0.	0.	0.	0.	0.	.0	0.	0.	0.	0.
South Africa	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	.0	.0	.0

Table 17. (continued)

	1970	*1971*	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*	*1980*	*1981*	*1982*
Spain	3.2	3.4	3.2	3.8	2.9	3.7	2.8	3.3	3.6	2.6	3.8	4.0	4.6
USA	.3	.0	.2	.4	1.1	1.7	1.4	.9	3.0	3.4	3.5	2.1	3.7
Uruguay	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.1	.7
USSR	.2	.2	.2	.2	.1	.3	.2	.1	.2	.1	.2	.0	.1
Venezuela	.0	.1	.0	.0	.0	.1	.0	.0	.0	.1	.0	.0	.0
Mediterranean. . .	3.1	4.7	5.5	4.4	4.6	3.9	4.2	4.9	5.5	5.0	5.4	4.8	5.1
Algeria	0.	0.	0.	.1	.2	.5	.4	.4	.3	.5	.7	.8	.9
Cyprus	0.	0.	0.	0.	0.	.0	.1	.1	.1	.1	.1	.1	.1
Greece.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.1	0.
Italy	1.8	2.9	3.7	2.8	3.3	3.0	3.3	3.3	4.0	3.4	3.7	2.5	3.0
Japan	0.	0.	0.	0.	0.	0.	.0	0.	.0	.0	.0	.0	.0
Libya	0.	.1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Malta	.1	.2	.2	.2	.2	.2	.2	.2	.1	.1	.2	.2	.2
Morocco	.2	.3	.2	.2	.2	.1	.2	.1	.2	0.	0.	0.	0.
Spain	.9	1.1	1.3	1.1	.7	.1	.1	.7	.7	.8	.8	1.1	.9
Tunisia	0.	0.	0.	0.	.0	.0	.0	0.	0.	0.	0.	.0	.0
Turkey	.1	.1	.1	.1	.0	.0	.0	.0	.0	.0	.0	.1	.0

Table 18. Atlantic and world southern bluefin catch (in MT)

	1970	*1971*	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*	*1980*	*1981*	*1982*
Total Atlantic	4,348	2,120	4,345	2,687	2,664	637	745	3,168	4,680	6,203	2,151	1,673	643
By gear													
Longline	4,348	2,120	4,345	2,687	2,662	637	745	3,168	4,680	6,203	2,138	1,667	643
Baitboat	0	0	0	0	1	0	0	0	0	0	13	6	0
Sport	0	0	0	0	1	0	0	0	0	0	0	0	0
By country													
China (Taiwan)	61	94	75	169	104	1	53	0	29	11	22	0	0
Japan	4,287	2,026	4,270	2,518	2,558	636	692	2,168	4,651	6,192	2,116	1,667	643
South Africa	0	0	0	0	2	0	0	0	0	0	13	6	0
World													
Longline (all oceans)	40,683	38,214	39,679	31,374	34,028	24,119	33,967	29,595	23,029	27,711	29,522	25,000	22,000
Surface (all oceans)	8,400	6,700	10,000	13,100	9,199	9,021	9,319	9,838	11,740	10,740	10,929	13,435	18,257
Total (all oceans)	49,083	44,914	49,679	44,474	43,227	33,140	43,086	39,433	34,769	38,451	40,451	42,935	40,257

Table 19. Atlantic small tuna catch (1,000 MT)

	1970	*1971*	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*	*1980*	*1981*	*1982*
Blackfin tuna *(T. atlanticus)*													
Total.	1.9	1.8	1.8	.8	1.0	.7	.9	1.2	1.2	1.4	1.1	1.8	1.7
Mediterranean. . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Atlantic.	1.9	1.8	1.8	.8	1.0	.7	.9	1.2	1.2	1.4	1.1	1.8	1.7
Atlantic little tuna *(E. alletteratus)*													
Total.	8.3	5.3	2.9	2.3	5.2	4.1	3.9	6.1	16.6	12.0	17.5	13.6	11.6
Mediterranean. . .	.7	.5	.7	.8	.9	1.0	1.5	1.5	1.5	1.3	1.0	.2	.2
Atlantic.	7.6	4.8	2.2	1.5	4.2	3.1	2.3	4.7	15.1	10.7	16.5	13.4	11.4
Atlantic bonito *(S. sarda)*													
Total.	29.5	44.3	24.5	12.1	20.9	15.2	15.8	20.6	17.0	18.2	32.9	42.4	48.2
Mediterranean. . .	21.6	28.7	16.0	6.2	7.7	6.1	6.5	8.7	9.2	12.8	20.8	32.8	35.8
Atlantic.	7.9	15.6	8.5	6.0	13.2	9.1	9.3	11.9	7.8	5.4	12.2	9.6	12.4
Frigate tuna *(A. thazard)*													
Total.	12.7	11.2	13.4	10.1	13.9	10.2	9.4	19.2	7.2	7.6	14.4	9.6	11.8
Mediterranean. . .	3.5	4.1	3.3	3.5	4.3	2.4	2.9	2.6	3.0	1.4	3.5	2.9	1.8
Atlantic.	9.2	7.1	10.2	6.7	9.6	7.9	6.5	16.6	4.2	6.2	10.9	6.7	10.0
King mackerel *(S. cavalla)*													
Total.	8.8	7.7	11.1	14.2	12.2	10.3	10.2	10.8	10.0	10.9	10.5	11.7	10.3
Mediterranean. . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Atlantic.	8.8	7.7	11.1	14.2	12.2	10.3	10.2	10.8	10.0	10.9	10.5	11.7	10.3
Spotted Spanish mackerel *(S. maculatus)*													
Total.	9.2	9.2	11.5	13.4	9.4	10.6	11.2	11.0	9.9	8.8	12.1	9.4	8.8
Mediterranean. . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Atlantic.	9.2	9.2	11.5	13.4	9.4	10.6	11.2	11.0	9.9	8.8	12.1	9.4	8.8
Cero *(S. regalis)*													
Total.	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
Mediterranean. . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Atlantic.	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1

West African Spanish mackerel *(S. tritor)*													
Total.	3.7	1.3	2.1	1.6	4.7	.8	1.9	2.6	6.8	4.2	4.9	2.6	3.3
Mediterranean. . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Atlantic.	3.7	1.3	2.1	1.6	4.7	.8	1.9	2.6	6.8	4.2	4.9	2.6	3.3
King mackerel unknown *(S. spp)*													
Total.	4.2	1.0	.9	1.1	1.0	1.3	1.0	1.0	1.0	.9	.8	.9	.9
Mediterranean. . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Atlantic.	4.2	1.0	.9	1.1	1.0	1.3	1.0	1.0	1.0	.9	.8	.9	.9
Wahoo *(A. solandri)*													
Total.	1.2	1.6	1.8	2.4	1.8	1.6	1.8	1.7	2.0	2.7	2.6	3.2	2.5
Mediterranean. . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Atlantic.	1.2	1.6	1.8	2.4	1.8	1.6	1.8	1.7	2.0	2.7	2.6	3.2	2.5
Others													
Total.	12.6	11.1	16.0	7.5	7.7	12.4	10.2	12.2	9.3	9.2	15.5	16.8	18.8
Mediterranean. . .	.6	.5	.5	.5	.4	.6	.4	.5	.4	.2	.1	1.4	1.5
Atlantic.	12.1	10.6	15.4	7.0	7.4	11.8	9.8	11.7	8.9	9.1	15.4	15.4	17.4
TOTAL.	92.2	94.6	86.1	65.6	78.0	67.4	66.2	86.5	81.0	76.0	112.4	112.3	118.0
Mediterranean. . .	26.4	33.8	20.5	10.9	13.3	10.0	11.4	13.3	14.2	15.6	25.4	37.3	39.3
Atlantic.	65.9	60.8	65.6	54.7	64.7	57.4	54.9	73.2	66.8	60.4	87.0	75.0	78.7

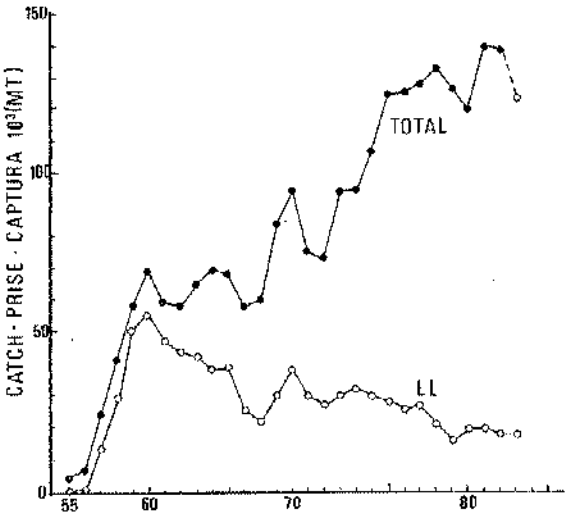


Fig. 1. Catch of yellowfin tuna in the Atlantic Ocean by longline and all gears combined, 1955-83.

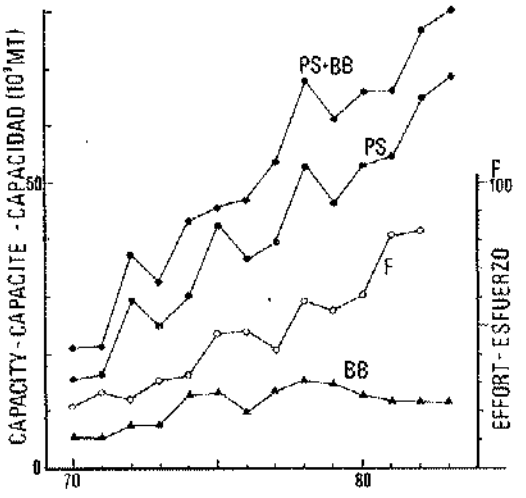


Fig. 2. Comparison of carrying capacity (SCRS/83/27) of surface fishing vessels and effective effort (SCRS/83/78) for eastern Atlantic yellowfin.

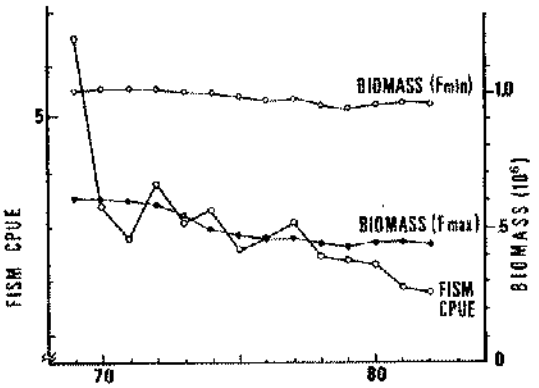


Fig. 3. Three indices of abundance for eastern Atlantic yellowfin. The 350 mm was arbitrarily chosen as the starting point of ages first appearing in the fisheries (SCRS/83/78).

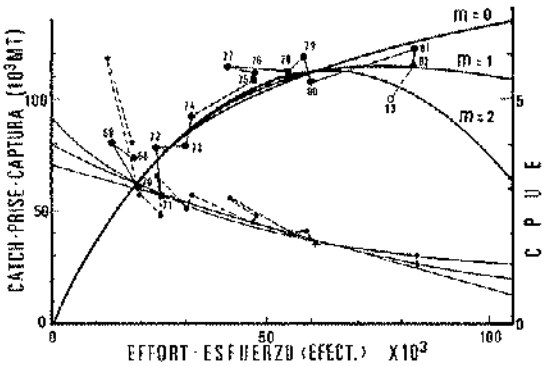


Fig. 4. General production model fitted for east Atlantic yellowfin; effort calculated from the FISM east Atlantic index, significant effort by 1 degree square/15 days = 12 hrs. The equilibrium curves are estimated by k = 3 and m = 0, 1 and 2. (*) Preliminary estimate (SCRS/83/78).

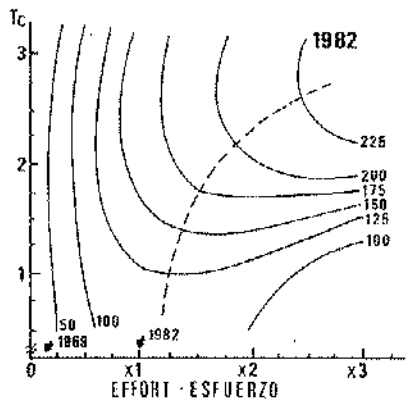


Fig. 5. Isopleths of yield (in 10^3 MT) for east Atlantic yellowfin. The 1969 and 1982 points are shown as well as the maximum yield curve (.....).

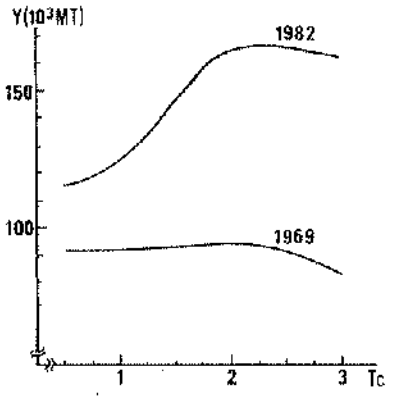


Fig. 6. Gains in yield (ordinate) resulting from an increase in age-at-first-capture (abscissa) for east Atlantic yellowfin during two periods of exploitation.

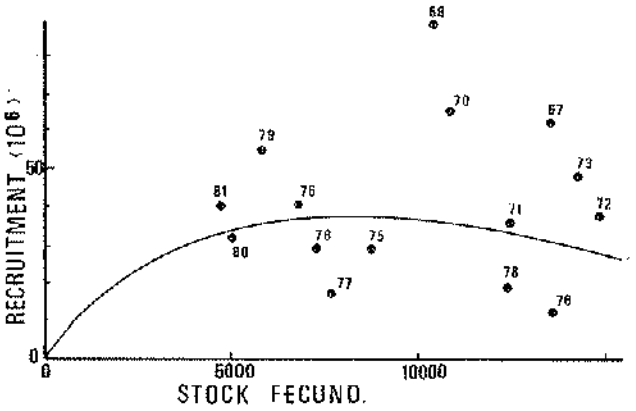


Fig. 7. Relation of stock fecundity (in 10^3 eggs, yearly spawning) and recruitment (in 10^6 individuals at age 6 mos.) under the hypothesis of F-max to variable recruitment (SCRS/83/78).

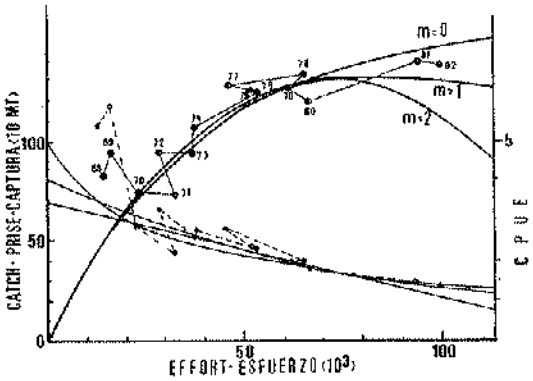


Fig. 8. A general production model fitted for total Atlantic yellowfin; effort calculated from the FISM east Atlantic index, significant effort by 1 degree square/15 days = 12 hrs. The equilibrium curves are estimated by k = 3 and m = 0, 1 and 2 (SCRS/83/78).

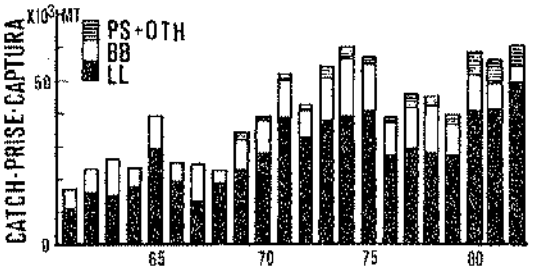
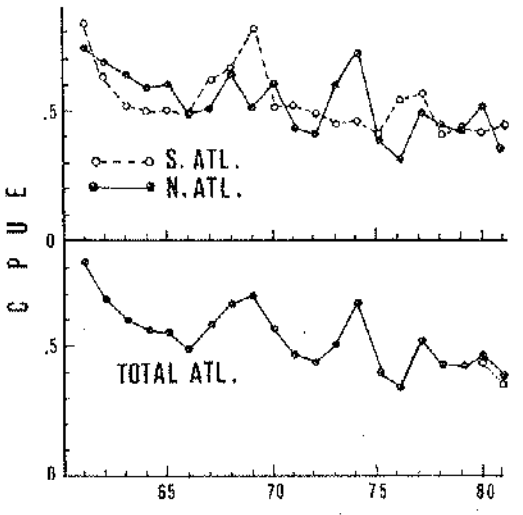


Fig. 9. Annual catch of bigeye tuna by gear in the Atlantic Ocean, 1961-82.

Fig. 10. Annual change in hook rates in the whole Atlantic (lower panel) and in the North and South Atlantic (upper panel), 1961-81. Circles in the lower panel show CPUE adjusted for the effect of deep longline operations in 1980 and 1981 (SCRS/83/46).



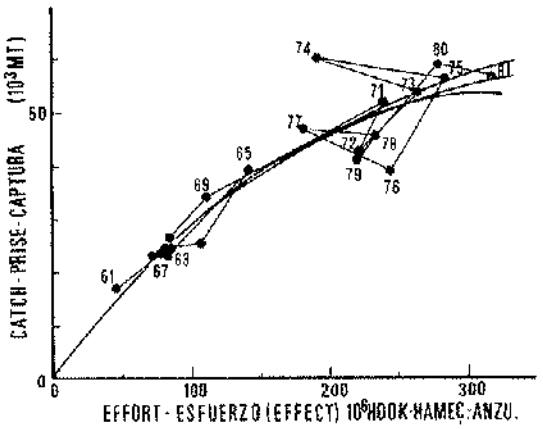


Fig. 11. Yield curves obtained from the production model analysis for bigeye in the whole Atlantic, 1961-81 (SCRS/83/46).

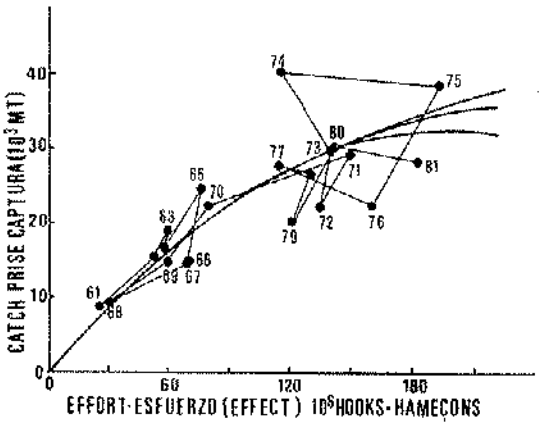


Fig. 12. Yield curves obtained from the production model analysis for bigeye in the North Atlantic, 1961-81 (SCRS/83/46).

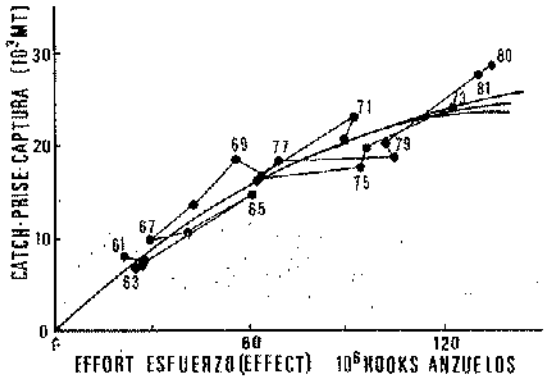


Fig. 13. Yield curves obtained from the production model analysis for bigeye in the South Atlantic, 1961-81 (SCRS/83/46).

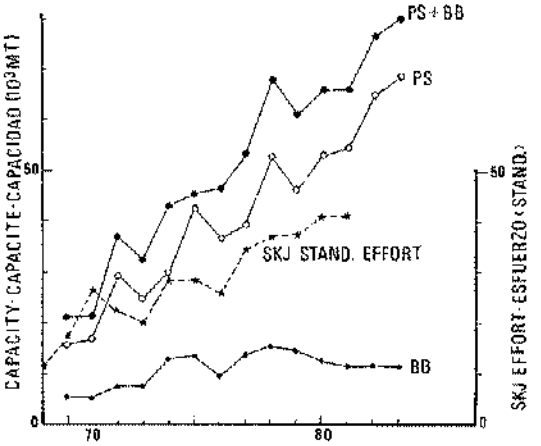


Fig. 14. Carrying capacities (SCRS/83/27) of the surface fishing fleet and effective effort (SCRS/83/78) for eastern Atlantic skipjack.

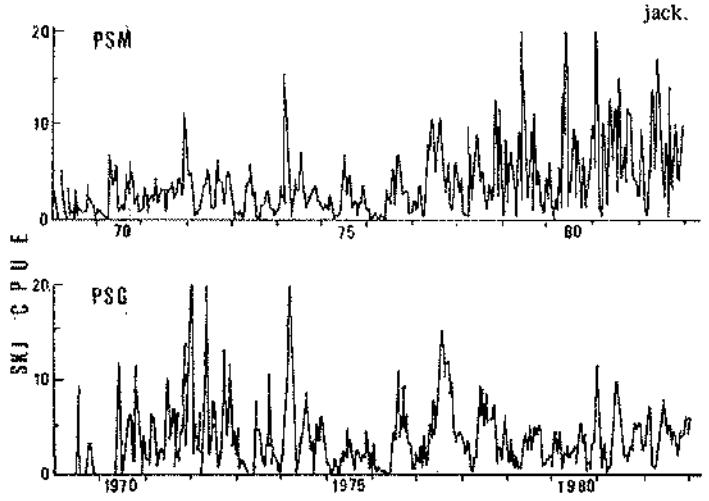


Fig. 15. Catch-per-unit effort (CPUE) for FISM large and medium purse seiners, 1969-82, by 15-day periods. CPUE is in units of MT per fishing day corrected for fishing power.

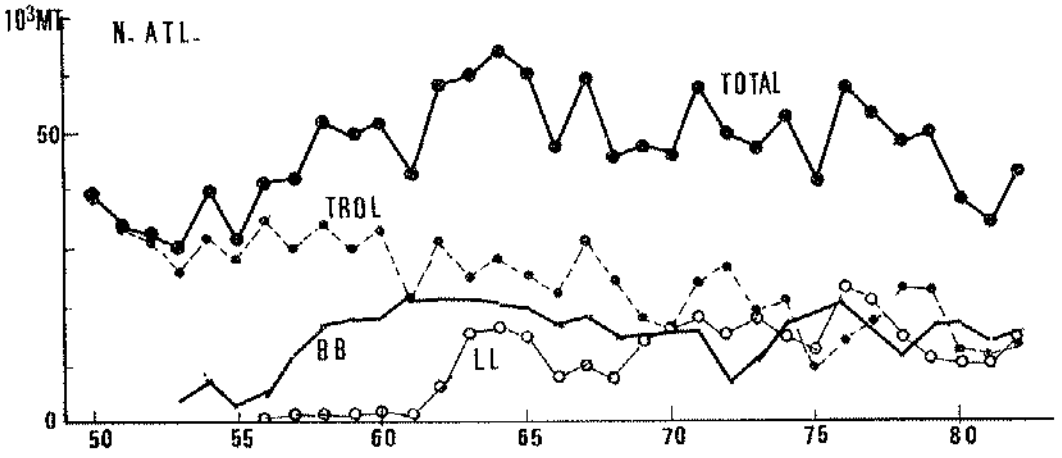


Fig. 16. Annual albacore catch, by fishery, in the North Atlantic.

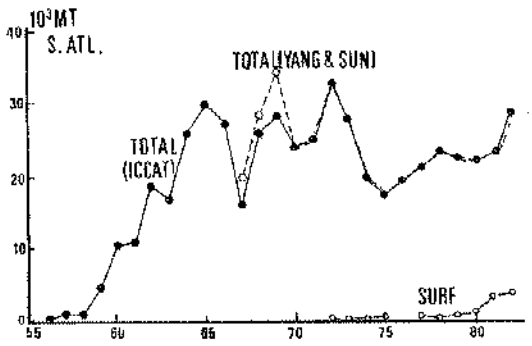


Fig. 17. Annual albacore catch in the South Atlantic.

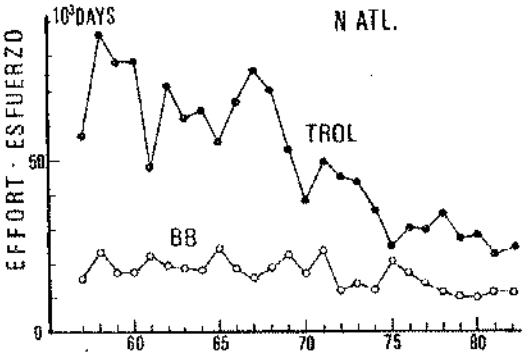


Fig. 18. Effective effort of the surface fishery, BB and troll, for the albacore north stock.

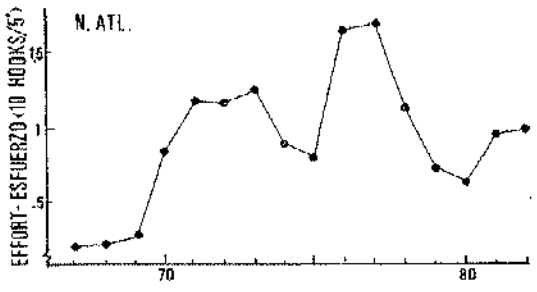


Fig. 19. Longline effort (in 10^3 hooks/5 degree square) for the albacore north stock.

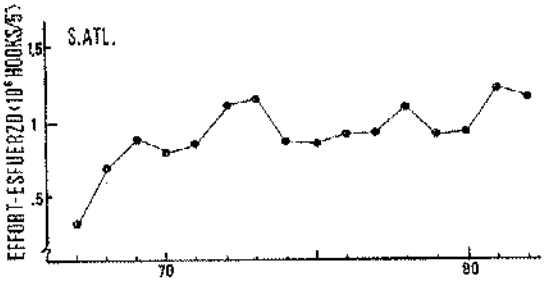


Fig. 20. Longline effort (in 10^3 hooks/5 degree square) for the albacore south stock.

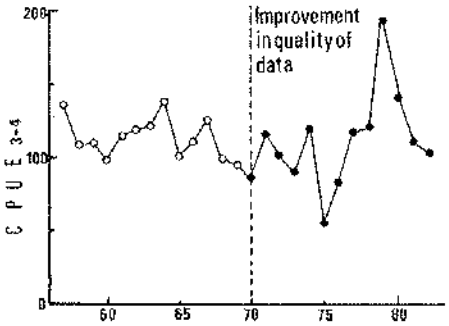


Fig. 21. CPUE of age-classes 3 and 4 for the combined surface fisheries for albacore in the North Atlantic.

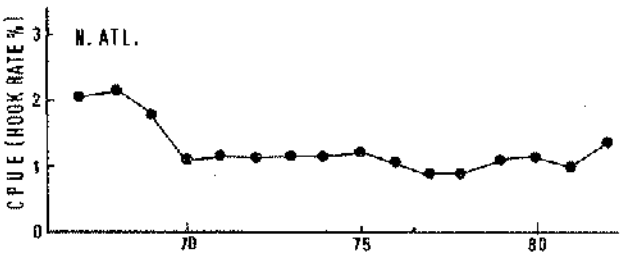


Fig. 22. Longline CPUE (hook rate in percent) for albacore in the North Atlantic.

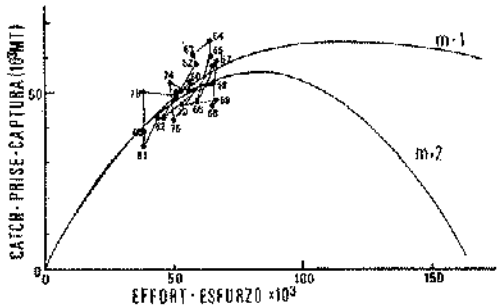


Fig. 23. Production model fitted to catch and standardized effort (standard baitboat fishing days) for North Atlantic albacore.

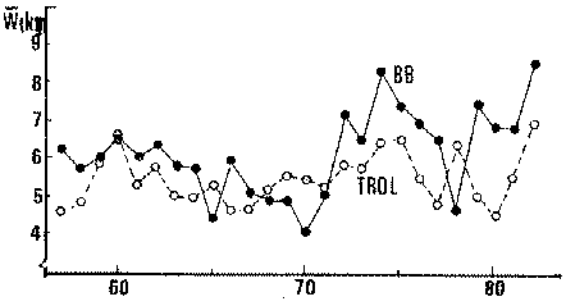


Fig. 24. Average weight of individuals from the North Atlantic albacore surface fishery.

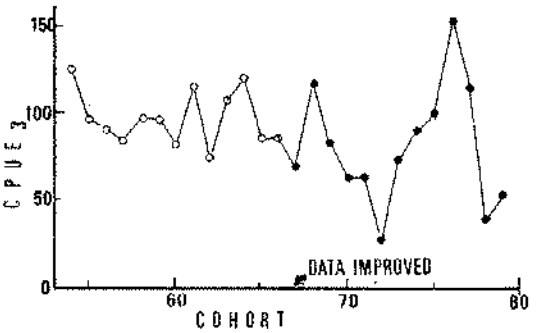


Fig. 25. Recruitment of North Atlantic albacore based on surface CPUE at age 3.

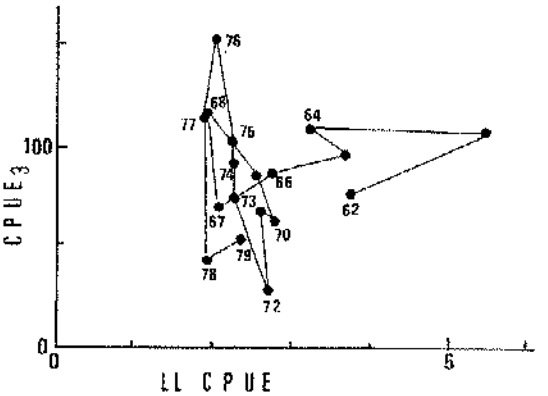


Fig. 26. Relationship of recruitment (surface CPUE at age 3) to spawning stock (longline CPUE in MT/10^3 hooks) for North Atlantic albacore.

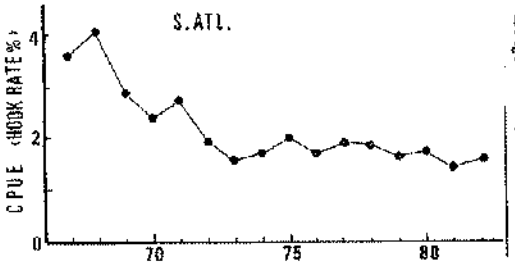


Fig. 27. Longline CPUE (hook rate in percent) for South Atlantic albacore.

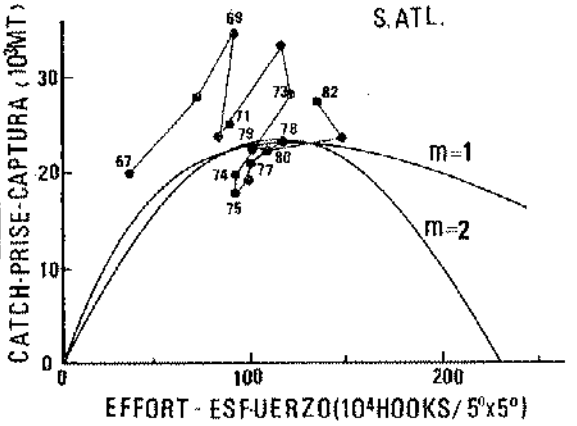


Fig. 28. Production model for South Atlantic albacore. Catch is expressed in MT; effort is expressed in fishing intensity/10^4 hooks /5 degree square.

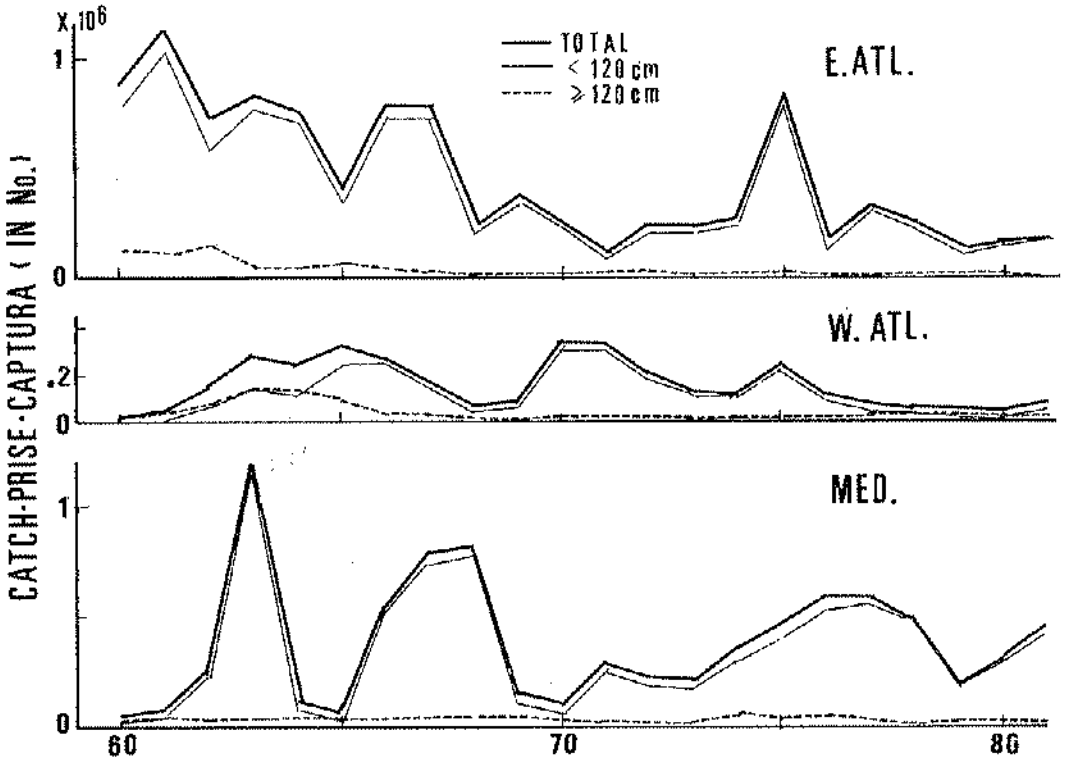


Fig. 29-A. Catch of bluefin tuna in number.

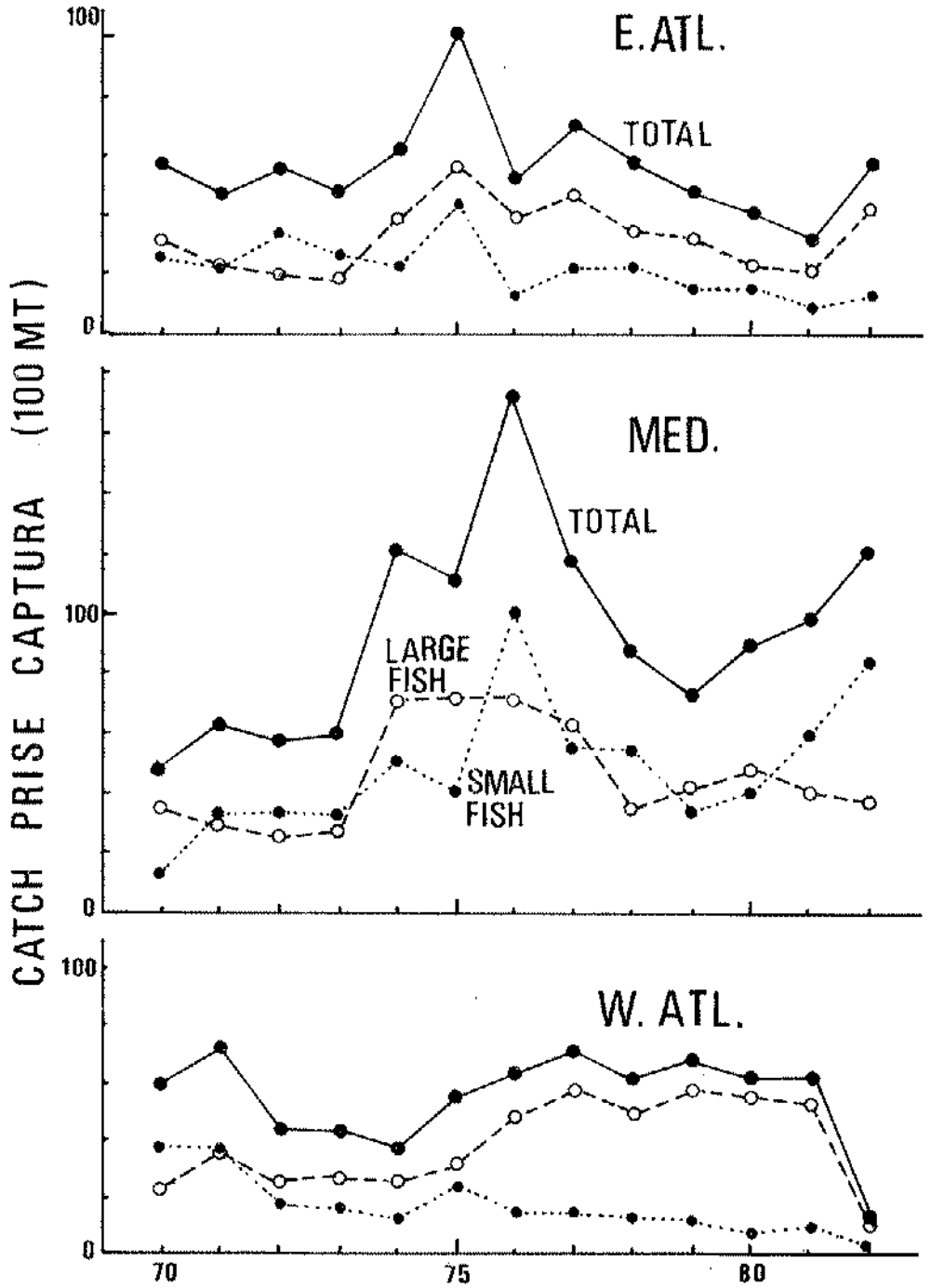


Fig. 29-B. Catch of bluefin tuna in weight.

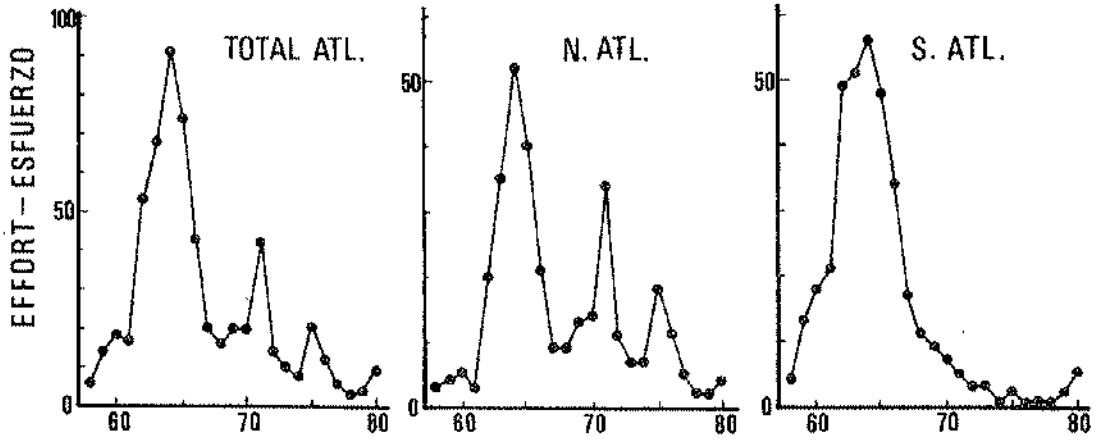


Fig. 30. Effective effort (10^6 hooks) for blue marlin in the Atlantic Ocean, 1958-80. All data are from the Japanese longline fishery (SCRS/82/70).

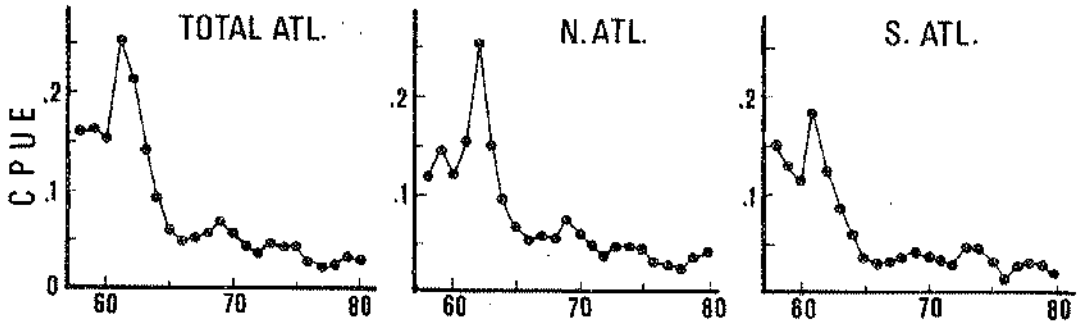


Fig. 31. Catch-per-unit of effective effort (no. fish/100 effective hooks) for blue marlin in the Atlantic, 1958-80. All data are from the Japanese longline fishery (SCRS/82/70).

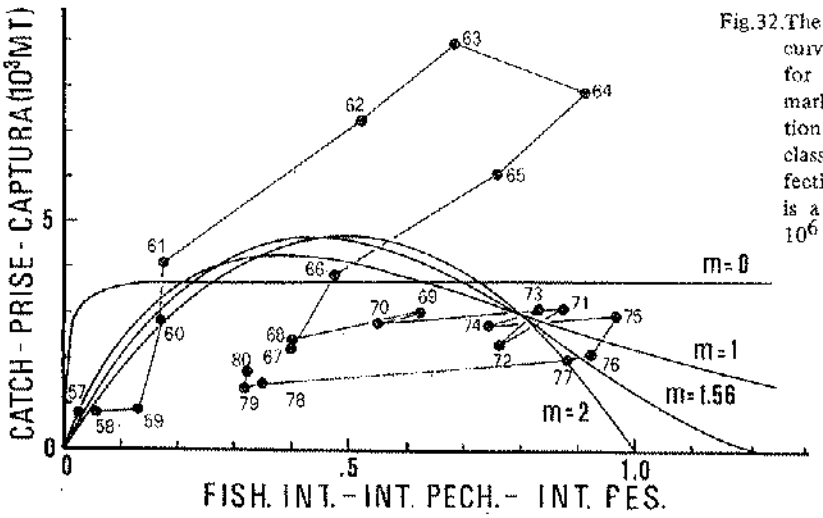


Fig.32.The equilibrium yield curves and observed data for total Atlantic blue marlin under the assumption of 5 significant year-classes in the catch. Effective fishing intensity is a weighted average in 10^6 hooks/5 degree area.

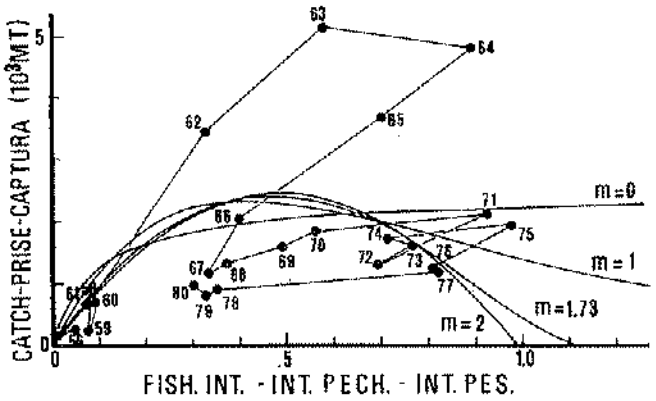


Fig. 33. Equilibrium yield curves and observed data for North Atlantic blue marlin under the assumption of 5 significant year-classes in the catch. Effective fishing intensity is a weighted average in 10^6 hooks/5 degree area.

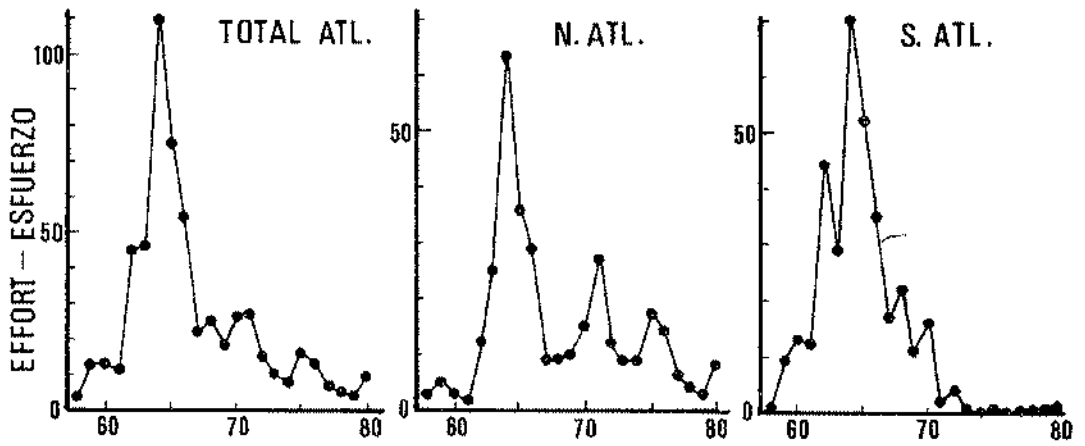


Fig. 34. Effective effort (10^6 hooks) for white marlin in the Atlantic Ocean, 1958-80. All data are from the Japanese longline fishery (SCRS/82/70).

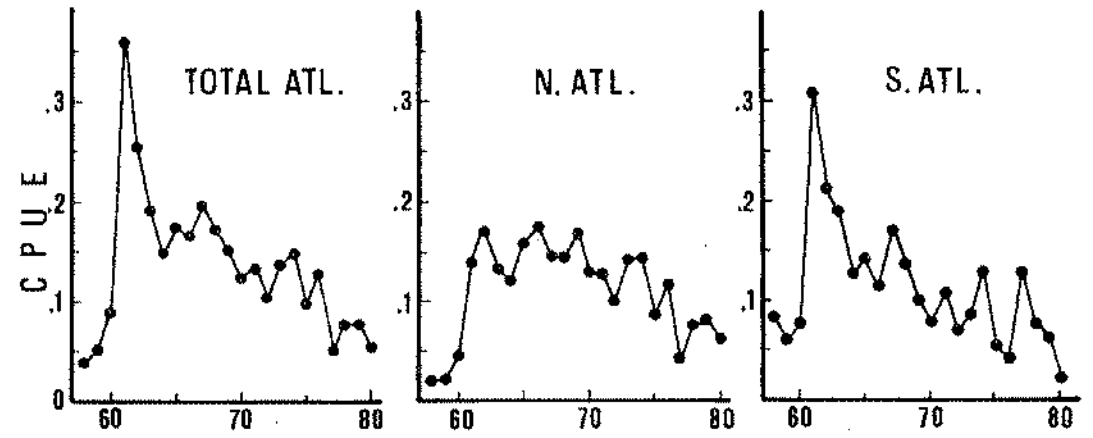


Fig. 35. Catch-per-unit of effective effort (no. fish/100 effective hooks) for white marlin in the Atlantic Ocean, 1958-80. All data are from the Japanese longline fishery (SCRS/82/70).

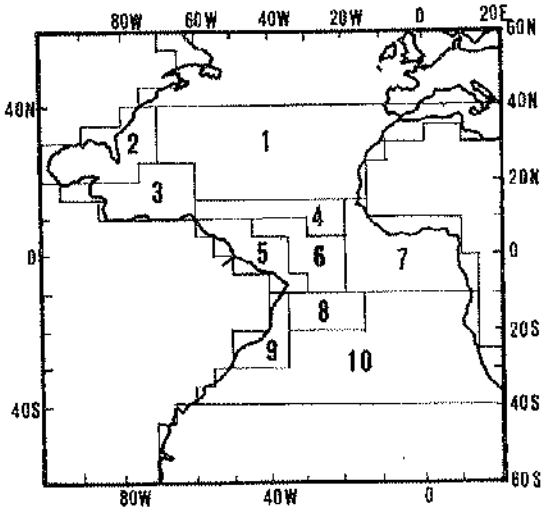


Fig. 36. Ten arbitrarily subdivided areas used for sailfish/spearfish analysis (SCRS/-82/45).

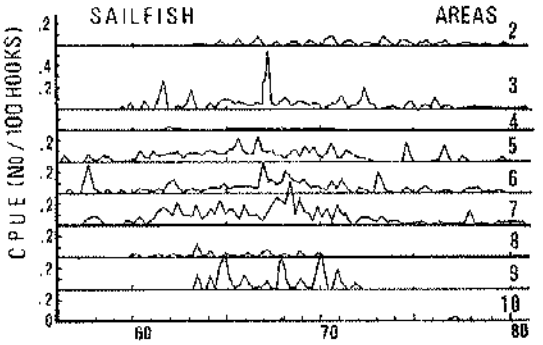


Fig. 37. Change in hook rate of sailfish from lumped catch data, 1956-80. (SCRS/82/45).

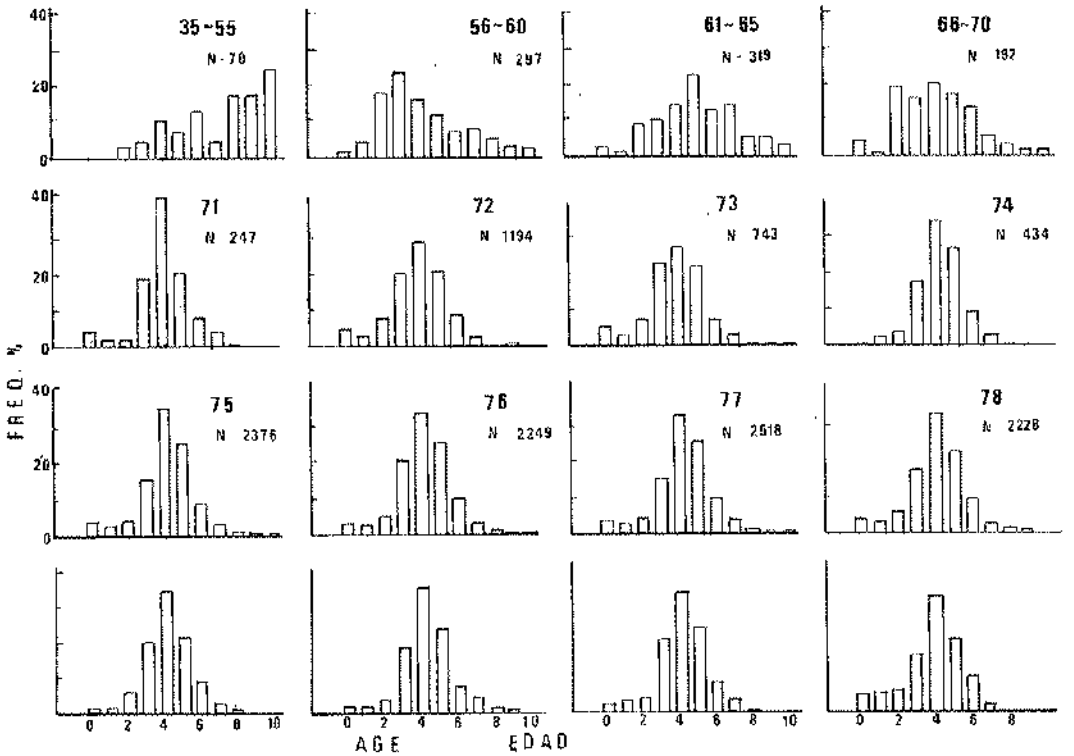


Fig. 38. Age frequency distribution of sailfish samples from the U.S.A. recreational fishery, 1935-82. Age distributions were derived deterministically from the length frequency distributions and the von Bertalanffy growth curve (sexes combined) (SCRS/83/66).

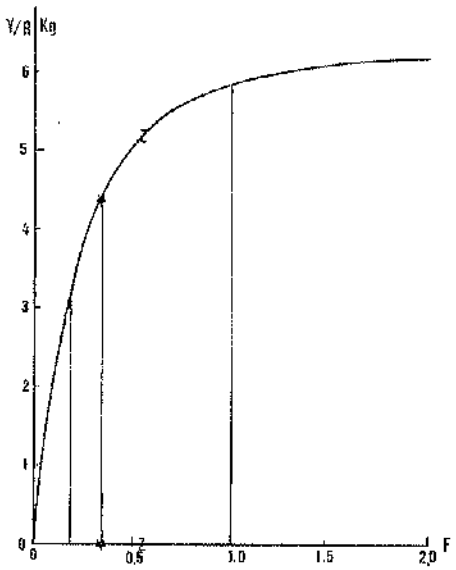


Fig. 39. Yield-per-recruit for sailfish (sexes combined) and various estimates of the instantaneous fishing mortality rate. The outer vertical lines represent the range of F values from the literature (assuming M = 0.34), and the line labeled with an asterisk (*) represents the best estimate of F (F = 0.34), and the point labeled Z represents $F_{0.1}$ (where the slope of the curve is one-tenth the slope at the origin) (SCRS/-83/66).

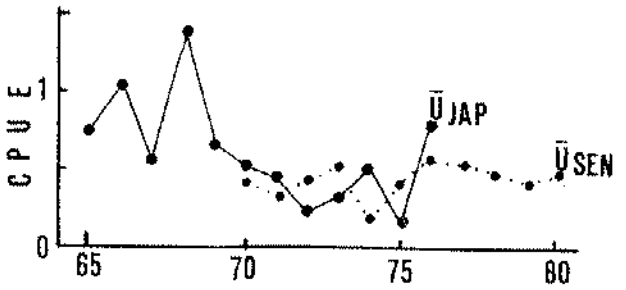


Fig. 40. Catch-per-unit effort (U - thousands of hooks per 5 degree square) of Japanese longliners (U JAP) and the Senegalese sport fishery (U SEN) (SCRS/80/55).

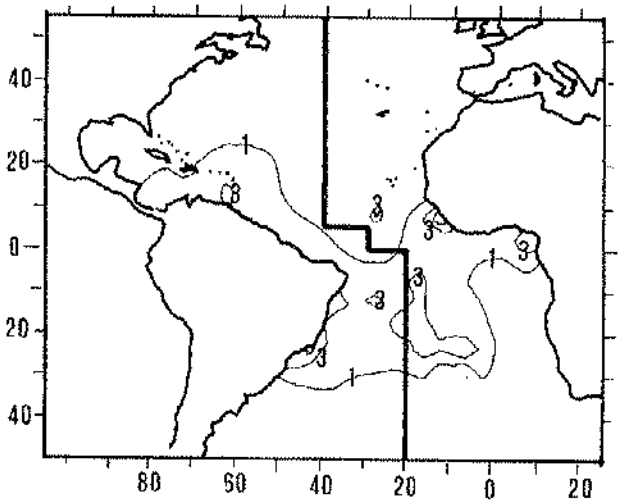


Fig. 41. Proposed dividing line (dotted line) between east and west Atlantic sailfish stocks (adapted from SCRS/-79/93).

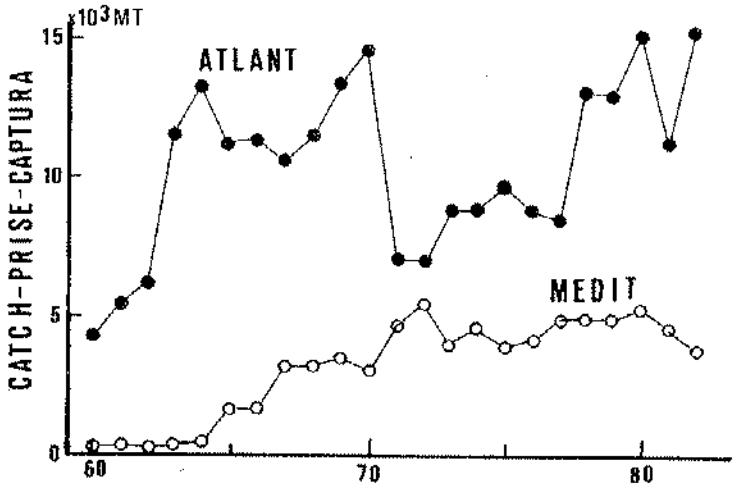


Fig. 42. The development of swordfish catches in the Atlantic and Mediterranean for the period, 1960-82.

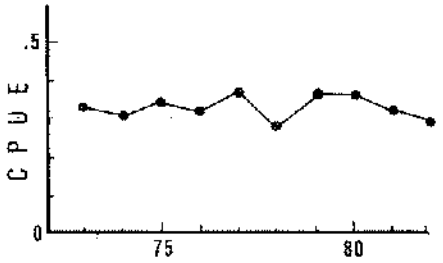


Fig. 43. Changes in Spanish swordfish CPUE in the Atlantic for 1982. CPUE is expressed in MT/10^3 hooks (SCRS/-83/52).

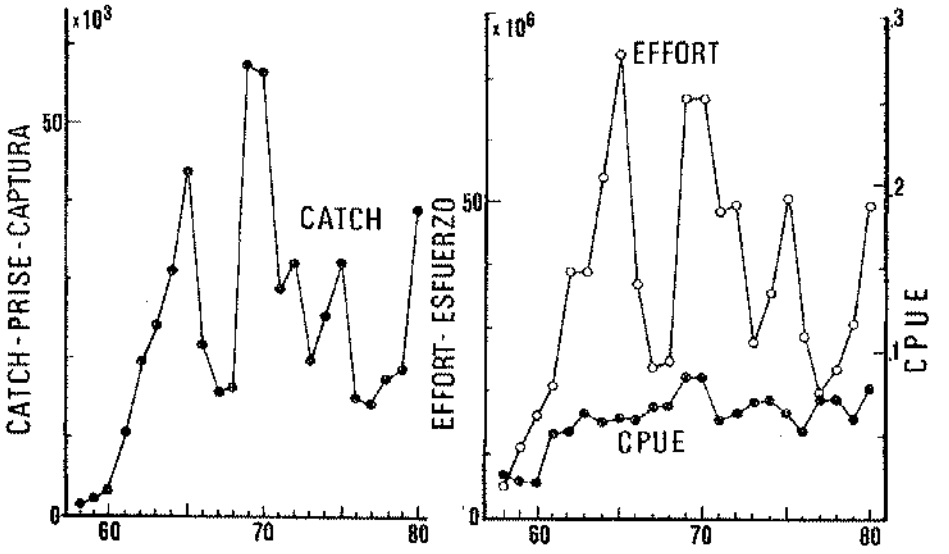


Fig. 44. Total Atlantic Ocean swordfish catch (10^3 fish), effective effort (10^6 hooks) and CPUE (no. fish/100 effective hooks) by the Japanese longline fleet, 1958-80 (SCRS/82/68).

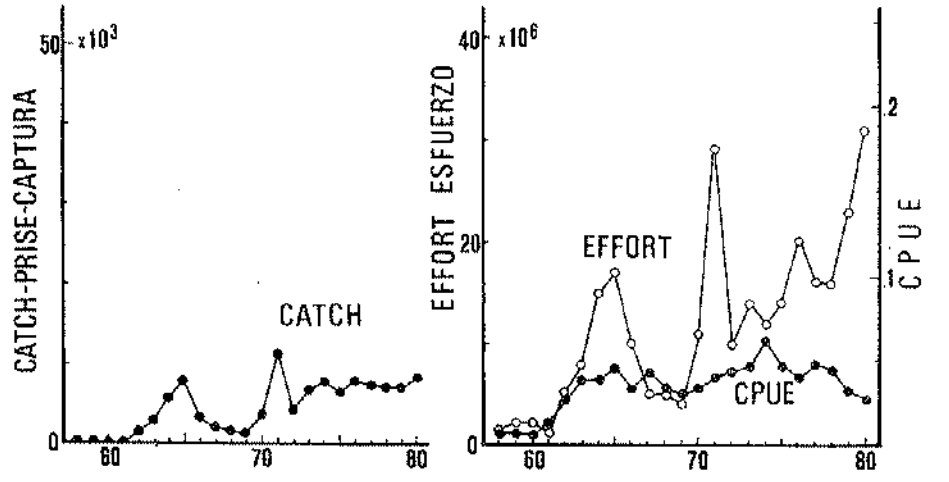


Fig. 45. Northwest Atlantic swordfish catch (10^3 fish), effective effort (10^6 hooks), and CPUE (no. fish/100 effective hooks) by the Japanese longline fleet, 1958-80 (SCRS/82/68).

Appendix 1 to Annex 10

AGENDA FOR THE STANDING COMMITTEE ON RESEARCH AND STATISTICS (SCRS)

1. Opening of the meeting
2. Adoption of Agenda and arrangements for the meeting
3. Admission of observers
4. Admission of scientific papers
5. Review of national fisheries and research programs
6. Review of conditions of stocks, with brief presentation of major papers on these subjects:

   Tropical tunas: YFT-Yellowfin, BET-Bigeye, SKJ-Skipjack
   ALB-Albacore
   BFT-Bluefin
   BIL-Billfishes, SWO-Swordfish and SBF-Southern bluefin
   SMT-Small tunas
   Multi-species: MTR-Tropical, MTE-Temperate
7. Review of the working plan of the Working Group on Juvenile Tropical Tunas
8. Review of the Report of the Bluefin Workshop
9. Review of the Report of the Sub-Committee on Skipjack and on the Skipjack Conference
10. Report of the Sub-Committee on Statistics and review of Atlantic tuna statistics and data management system:
    a. National statistics and Secretariat reporting
    b. Unconventional fleet statistics
    c. Biostatistical studies
    d. Bluefin catch-by-size data base
    e. Others
11. Report on ICCAT Training Courses in Statistics and Sampling
12. Review of SCRS research programs and consideration of working procedures
    a. Meeting organization and reporting procedures
    b. ICCAT Symposium
    c. Bluefin stock identification
    d. Intersessional meetings
    e. Evaluation of the need for a micro-computer
    f. Other matters

13. Cooperation with other organizations
14. Review of scientific publications
15. Recommendations
16. Date and place of next meeting
17. Other matters
18. Election of Chairman
19. Adoption of Report
20. Adjournment

Appendix 2 Annex 10

LIST OF DOCUMENTS

SCRS/83/ 1 Tentative Agenda of the SCRS.
2 Annotated Tentative Agenda of the SCRS.
3 Tentative Schedule.
4 Tentative Agenda for the Sub-Committee on Statistics
5 Organization of the 1983 SCRS Meeting.
6 Document Policy.
7 SCRS Officers' Meeting.
8 Collective Volume, XVIII (1) Tropical Species.
9 Collective Volume, XVIII (2) Temperate Species.
10 Collective Volume, XVIII (3) Billfishes, Small Tunas, General Statistics.
11 Collective Volume, XVIII (4) 1982 SCRS Report "A".
12 Data Record, Vol. 21.
13 Data Record, Vol. 22.
14 Report for the Biennial Period, 1982-83 (Part I, 1982).
15 Report of the Bluefin Workshop.
16 Skipjack Conference Report.
17 Report of the Working Group on Juvenile Tropical Tunas.
18 Training Courses, 1983.
19 1983 SCRS Report "A" (working document).
20 1982 SCRS Report "B" (summary presented to the Commission).
21 Statistical Bulletin, Vol. 13 (Provisional).
22 Secretariat Report on Research and Statistics.
23 Feasibility and Comparative Studies of Purchasing Mini-Computers/Word Processors.
24 An Overview of the ICCAT Task II Data Base.
25 Statistical Series-11.
26 The application of sequential population analysis to the assessment of bluefin tuna *(Thunnus thynnus thynnus)* in the North Atlantic – W. G. Doubleday
27 Review of Historical Fleet Sizes for Major Fisheries – P. M. Miyake

28 Report of the Ad Hoc Inter-Agency Consultation on Atlantic Fishery Statistics, October 8-9, 1983, Gothenburg, Sweden

29 Document withdrawn.

30 Growth and age of bigeye and yellowfin tuna in the central Atlantic as data gathered by R/V "Wieczno" – B. Draganik, W. Pelczarski (MIR)

31 Captura y esfuerzo de la pesquería venezolana del atún por palangre y caña durante el año 1981 – A. Calderon de Vizcaino, H. Salazar

32 Croissance de l'albacore *(Thunnus albacares)* atlantique, d'après les données des marquages – F. X. Bard

33 Etude de l'adéquation des échantillonnages de la flottille FISM d'après les données recueillies en mer par des observateurs (1981-1983) – F.X. Bard

34 Etude de l'influence des diverses relations tailles-poids pour le thon obèse *(Thunnus obesus)* sur les estimations des structures démographiques – J. B. Amon Kothias, F. X. Bard

35 South African National Report – 1982

36 Una clave talla/edad por lectura de espinas para el atún rojo *(Thunnus thynnus* L.) del Atlántico Este – J. C. Rey, J. L. Cort

37 Synopsis biológica del bonito, *Sarda sarda* (Bloch), del Mediterráneo y Atlántico Este – J. C.Rey, E. Alot, A. Ramos

38 Distribución geográfica de atún rojo *(Thunnus thynnus,* L.) juvenil del Atlántico Este, Mediterraneo Occidental y Adriático – J. L. Cort, J. C. Rey

39 Contribución al estudio de la pesquería de palangre del pez espada *(Xiphias gladius)* en el Mediterráneo Occidental – J. C. Rey, E. Alot

40 Document withdrawn.

41 Reliability of the size composition data of the catches for the Atlantic bluefin tuna – T. Nagai

42 Stock assessment of the Atlantic bluefin tuna assessed with the use of separable VPA – T. Nagai

43 Bluefin fisheries and stocks in the Atlantic, 1970-81 – Z. Suzuki

44 Los palangres de deriva cubanos – A. Rodríguez Rodríguez, M. García Pérez

45 On the growth of yellowfin and bigeye tuna estimated from the tagging results – N. Miyabe

46 On the stock status of Atlantic bigeye tuna evaluated by production model analysis – S. Kume

47 A note on the catch and effort data of Japanese Tema-based baitboat fleet in 1981 and 1982 – S. Kume

48 An approach to estimation of total allowable catch of Atlantic bluefin tuna – S. Kume, Z. Suzuki, T. Nagai

49 Sexual maturity and sex-ratios of the skipjack tuna, *Katsuwonus pelamis* (Linnaeus), from southeastern Brazil – S. Jablonski, A. A. Braile, C. M. Romao, M. S. M. Teixeira

50 First attempt to identify areas favorable for the surface occurrence of skipjack *(Katsuwonus pelamis)* off the southeastern coast of Brazil – S. Maluf, Y. Matsuura, J. L. Stech

51 Estado actual de la pesquería de atún blanco *(Thunnus alalunga)* del Atlántico Norte – A. González-Garcés, J. Mejuto

52 La pesquería española del pez espada *(Xiphias gladius)*, 1973-1982 – A. G. Garcés, J. C. Rey

53 Informe sobre la pesca e investigación española de túnidos en 1982 y 1983 – A.G. Garcés

54 Space-time patterns in the French and Spanish purse seine fishery for yellowfin tuna in the eastern Atlantic – D. Au

55 An example of the use of microcomputers for population assessment: investigation of the effects of uncertainty in catch data on results of cohort analysis – P. Kleiber, W. Parks

56 Analysis of ISYP skipjack tagging results using the methods of the South Pacific Commission Skipjack Programme – P. Kleiber, S. Chivers, E. Weber

57 Analysis of Atlantic yellowfin tuna cohort statistics – R. G. Rinaldo

58 Evaluation of a method for determining limits on estimates of recruitment and fishing mortality using cohort and yield per recruit analyses – R. Rinaldo, P. Kleiber

59 Effects of sample size on the accuracy of length-frequency sampling of tunas transshipped to Puerto Rico – A. L. Coan, N. W. Bartoo

60 Differences between length-frequency samples taken in Puerto Rico and other sampling sources – T. C. Foster, A. L. Coan

61 Preliminary analysis of the Canadian Atlantic bluefin tuna fishery during 1983 – T. R. Hurlbut, J. J. Maguire

62 An examination of the U.S.A. rod and reel juvenile bluefin tuna catch-per-unit effort – S. Nichols

63 Document withdrawn.

64 A review of some Atlantic bluefin tuna fisheries data – NMFS, Southeast Fisheries Center

65 Progress in estimating age of blue marlin, *Makaira nigricans,* and white marlin, *Tetrapturus albidus,* from the western Atlantic Ocean, Caribbean Sea, and Gulf of Mexico – E. D. Prince, D. W. Lee, C. A. Wilson, J. M. Dean

66 Yield per recruit analysis of sailfish, *Istiophorus platypterus,* in the western Atlantic Ocean – R. J. Conser

67 Pesquería española de túnidos tropicales 1982. Proporción rabil-patudo y composición de tallas – P. Pallarés, A. M. Fernández, J. M. Mamolar

68 Marcado de atún blanco, *Thunnus alalunga,* en las costas de Galicia (NW de España) durante el verano de 1983. "Albacora 83" – J. Mejuto

69 Korean tuna fisheries and research activities, 1982-1983

70 Madurez sexual y sex-ratio del listado *(Katsuwonus pelamis,* L.) capturado en las Islas Canarias y costa occidental de Africa (21°N-30°N) – J. A. García Vela, Al. Santos Guerra

71 Maps of favorable areas for tuna fishing in the southwestern Atlantic prepared from satellite data – M. M. Abdon

72 Japanese tuna fishery and research in the Atlantic, 1982-1983 – S. Kume

73 Bilan de la campagne thonière au large des côtes françaises de Méditerranée en 1982 – B. Liorzou

74 Size and species compositions of Atlantic tunas from imports landed in Puerto Rico during 1982 – T. C. Foster, E. R. Holzapfel

75 New data on reproduction of Auxis spp. in the Gulf of Guinea – G. P. Rudomiotkina

76 Feeding intensity of bigeye tuna, *Thunnus obesus* (Lowe), in the Atlantic Ocean – V. Z. Gaikov

77 Statistiques de la pêcherie thonière FISM durant la période 1969 à 1982 – A. Fonteneau, P. Cayré

78 Analyse de l'état des stocks d'albacore de l'Atlantique au 30 septembre 1983 – A. Fonteneau

79 Rapport sur la pêche et la recherche thonière au Sénégal en 1982-1983 – P. Cayré

80 Croissance du thon obèse (*Thunnus obesus*) de l'Atlantique d'après les résultats de marquage - P. Cayré, T. Diouf

81 Canadian national report, 1982-1983 – T.R. Hurlbut, J.J. Maguire

82 Review of United States fisheries and research activities on tunas and tuna-like fishes of the Atlantic Ocean for 1982-1983 – NMFS

83 Comparison on the distributions of the fishing grounds of yellowfin (*Thunnus albacares*) and bigeye tuna (*Thunnus obesus*) by Korean longliners, 1979-1982 – J. U. Lee, W. S. Yang

84 Bluefin tuna sex proportion at length in the Canadian samples 1974-1983 – J. J. Maguire, T.R. Hurlbut

85 Production model analysis of the South Atlantic albacore, 1967-1982 – C. L. Sun, R. T. Yang

86 Overall fishing intensity and yield by the Atlantic longline fishery for albacore, 1967-1982 – C. L. Sun, R. T. Yang

87 Distribution, yield and overall fishing intensity of Atlantic albacore caught by the longline fishery, 1967-1981 – R. T. Yang, C. L. Sun

88 Informe nacional de las pesquerías cubanas de túnidos correspondientes a 1982, así como de las actividades de investigación durante 1982-1983 – B. García Moreno, A. Rodríguez

89 Rapport de recherche – France

90 Resumé de la situation de la pêche aux thonidés–République du Cap Vert, 1983 – H. Santa Rita Vieira

91 Rapport national de la Côte d'Ivoire – F. X. Bard, J. B. Amon Kothias

Appendix 3 to Annex 10

REPORT OF THE INTERNATIONAL SKIPJACK YEAR PROGRAM (ISYP) CONFERENCE OF ICCAT*

INTRODUCTION

The International Skipjack Year Program of ICCAT was executed during 1979 through 1982 with a goal of answering four questions:

1. Can catches be increased by fishing new areas and new stocks, especially in the western Atlantic?

2. Can catches be increased by catching large-sized fish, especially fish over 5 kg?

3. What will be the effects of increased catches on the skipjack tuna resource?

4. How can better assessments of the stocks be obtained?

Scientists from 13 ICCAT member countries were actively involved in the research activities of the Program. Because results of several research activities were involved in addressing each question, and scientists from several countries were involved, an ICCAT-sponsored Conference was organized to bring the scientists together to pool and review their results and answer the questions set forth for the Program. The Conference was held in Santa Cruz, Tenerife, Spain, from June 21 through 29, 1983. It was organized in two parts: Part 1, presentation of scientific papers related to skipjack tuna and results of ISYP activities; and Part 2, panel discussions of ISYP results relative to answering the questions. Part 1 was organized and chaired by Dr. Philip Symons, coordinator of the ISYP, and Part 2 was chaired by Dr. Gary Sakagawa, Convener of the Sub-Committee on Skipjack.

Fifty scientists participated in the Conference and reviewed results presented in 46 papers. These papers are undergoing further review by experts in preparation for publication by ICCAT.

Part 2 of the Conference consisted of three panels, each assigned one or more questions to answer. The first panel was chaired by Mr. José Negreiros Aragao and assigned questions (1) and (2) above, or simply, can skipjack tuna catches be increased on a sustained basis? Dr. Peter Miyake served as rapporteur for this panel. The second panel was chaired by Dr. Robert Kearney and assigned question (3), what will be the effects of

*Report prepared by participants at the ISYP Conference for the SCRS Sub-Committee on Skipjack. G. Sakagawa, Sub-Committee Convener, P. Symons, ISYP Coordinator, and P. Miyake, ICCAT Secretariat, edited the report.

increased catches on the skipjack tuna resource? He was assisted by Dr. David Au as rapporteur. The third panel, chaired by Dr. Alain Fonteneau, was responsible for answering question (4), how can skipjack tuna stock assessments be improved? Rapporteur for this panel was Mr. James Beckett. Included in this report is a summary of the findings of the panels as well as a detailed review of the ISYP research results.

SUMMARY OF FINDINGS

Can Skipjack Tuna Catches Be Increased on a Sustained Basis?

Yes. Catches can be increased from the 1982 level of 150,000 MT through fishing more intensely in traditional fishing areas, such as in the Gulf of Guinea, off Angola, in the Cape Verde Islands and off Cuba; through expansion of fishing into new areas, such as off southeastern Brazil, Gulf of Mexico, and Caribbean Sea; and through fishing for large-sized (over 55 cm long) skipjack tuna. Employment of aggregating devices to concentrate and make fish more available to fishermen and development of new fishing techniques to catch large-sized fish can contribute to increases in both fishing efficiency and catches of skipjack tuna.

What Will Be the Effects of Increased Catches on the Skipjack Tuna Resource?

Mixed effects. For at least small to moderate increases in catches, there probably will be no detectable effect on the future productivity of the overall Atlantic skipjack resource. The current stock size is not likely near the level at which recruitment is reduced and the current level of exploitation has not had a serious effect on the population. Natural attrition (natural mortality, emigration and decreased vulnerability) accounts for a high toll.

With increased catches, however, there will probably be an undesirable effect of increased competition among units of fishing gear for the same fish since some individuals migrate over long distances through different fishing areas and during different seasons. Some of this competition can be reduced through time-area allocation of fishing effort.

Also, increased catches of skipjack tuna will likely have the undesirable effect of increasing mortality of young yellowfin and bigeye tunas. Young of these species frequently school with skipjack tuna and currently are under intense fishing pressure, which ICCAT's current minimum size regulations are attempting to reduce.

How Can Skipjack Tuna Assessments Be Improved?

By expanding ICCAT's data base and obtaining more biological information. With the current high catches of skipjack tuna and potential further expansion of the fisheries, improved methods for assessing the condition of the resources and the effects of fishing on it are needed. The ISYP generated a series of research recommendations for improving ICCAT's data base and information on skipjack tuna for stock assessment. These include recommendations for continued efforts to obtain accurate fisheries and biological statis-

tics for all Atlantic skipjack tuna fisheries, further analyses of data collected by the ISYP, and continuation of certain ISYP activities, particularly tagging experiments.

REVIEW OF RESEARCH RESULTS

Research results for seven topics: (1) stock structure, (2) spawning areas, (3) migration, (4) mortality, (5) growth, (6) recruitment, and (7) catch-per-unit effort, were reviewed by the Conference participants. The information formed the basis for answers to the questions.

Stock Structure

Research (Doc. 24) was conducted to determine the stock structure of skipjack tuna within the Atlantic Ocean. The research involved restrictive enzyme analysis of mitochondrial DNA to detect genetic differences between fish from different sampling areas. The approach used was to establish an upper limit on the possible amount of genetic differentiation by comparison of fish from the Atlantic and from thePacific Ocean which are clearly geographically separated. The results showed a striking lack of significant genetic differentiation between fish from the two oceans. It seems, therefore, unlikely that significant genetic differentiation will be demonstrated between fish within the Atlantic Ocean.

Consequently, the resource can perhaps best be managed by partitioning it into management units. These units should be defined on the basis of a slow rate of interchange between them and not upon complete genetic isolation. There are insufficient data, particularly from tagging studies, to determine the rate of interchange of skipjack between distant areas within the Atlantic. Although studies (Docs. 8, 11, 33) in the eastern Atlantic have confirmed extensive movement of fish within that region, there is yet no evidence of interchange between eastern and western Atlantic skipjack tuna. Therefore, the entire Atlantic skipjack tuna resource cannot be partitioned into management units according to the rate of interchange, although current evidence from tagging suggests that the eastern Atlantic region can be treated as a single management unit.

Spawning Areas

The ISYP research included investigations for determining the pattern of skipjack reproduction in the Atlantic (Docs. 1, 12, 23, 25, 27, 30, 36). Studies using gonad index and larval distribution data produced a pattern (Figs. 1 and 2) characterized by geographic areas which appear to have suitable environmental conditions for spawning rather than to separateness of stocks. Spawning most frequently occurs in waters with temperature greater than 24°C and individuals probably spawn several times during the year. Two types of area have so far been identified: (1) Equatorial (principally Gulf of Guinea to off Liberia, off northwestern Brazil and in the Caribbean Sea)--where spawning takes place year-round with varying intensity, and (2) Subtropical (principally around the Cape Verde Islands, off southeastern Brazil and off southeastern U.S.)--where spawning is

sporadic, occurring only during the local summer and dependent upon occurrence of localized, suitable conditions.

Migration

The ISYP research produced new information on migration of skipjack tuna, principally from tagging (Docs. 11, 33, 40). Because the information was more complete for the eastern Atlantic than for the western and mid-Atlantic, a migration pattern for skipjack in only the eastern region was deduced (Fig. 5). It depicts complicated and extensive movements of a widespread skipjack tuna resource along the African coast with offshore movements of fish, which subsequently become unavailable to the fishery, and inshore movements of pre-recruits which enter the fishery. Data show that large fish, especially those greater than 55 cm in length, are not caught by the fishery in large numbers and apparently disappear from the eastern region at a rate greater than estimates of natural mortality would imply. Whether these fish actually die or move to other areas of the Atlantic is not known, although large skipjack (55-80 cm long) have been reportedly caught occasionally by longliners operating in the mid-Atlantic.

Mortality

Data collected by the Program were used to estimate mortality rates using two different methods (Docs. 8, 17). One method (Doc. 17) used a combination of catch curve and cohort analysis for estimating the instantaneous total mortality rate (Z) and instantaneous fishing mortality rate (F), assuming instantaneous natural mortality rate (M) to be equal to 0.6 yr^{-1}. This produced the following results:

	Ages 1.5-3.0 yr.		*Ages 1.0-5.0 yr.*	
Year	$Z = F+M\ yr^{-1}$	$F\ yr^{-1}$	$Z = F+M\ yr^{-1}$	$F\ yr^{-1}$
1979	1.09	0.49	0.85	0.25
1980	1.15	0.55	0.89	0.29
1981	1.26	0.66	0.95	0.35

The other method (Doc. 8) used tag-recovery data from the eastern Atlantic and estimated the instantaneous total attrition rate (Z') of 2.3-3.5 yr^{-1}, F of 0.54 yr^{-1}, and instantaneous natural attrition rate (X') of 1.8-2.0 yr^{-1}. The components of attrition comprise all mortality and mortality-like processes, including emigration and decrease in vulnerability with age and tag loss.

The results of these studies show fishing mortality (25-66 percent annually) as being a moderate fraction of the total attrition rate (90-97 percent annually). The implication is that current levels of fishing are unlikely to be affecting the skipjack population to a large degree since natural processes (attrition) are taking a high percentage of the population.

Growth

The rate of growth is an important factor in determining a species' productivity and an important parameter in most population assessment models. Studies on growth of skipjack tuna were conducted under the auspices of ISYP (Docs. 5, 9, 11, 15). The studies show that the growth rate of skipjack tuna appears to vary according to season and area. Results are summarized below, showing fish from equatorial waters growing more slowly during the first year after recruitment than fish from subtropical waters.

			Fork Length (mm) At Age[1]			
Area	*Source*	*Quarter of year*	*r*	*r+1*	*r+2*	*r+3*
Equatorial[2]	Doc. 9	1-4	350	474	564	628
	Doc. 15	1-4	350	487	587	661
Subtropical[3]	Doc. 11	3-4	350	574	583	584

1 r = time at recruitment of 350 mm long.
2 Equatorial area between 5°N and 5°S latitude off Africa.
3 Subtropical area is north of 5°N off Africa.

Recruitment

No direct measurement of recruitment was made although some information collected by the ISYP gives a better understanding of recruitment trends for Atlantic skipjack tuna (Docs. 8, 17). Results of analysis of tagging data, catches and reproduction show that skipjack move over long distances, spawn year-round over a large area and are recruited at 35-55 cm fork length, year-round in the eastern Atlantic fishery. Overall spawning and recruitment, therefore, could be at least partially independent of local environmental conditions. Some evidence suggested that recruitment to the eastern Atlantic fishery was relatively stable over the years 1968-1980, during a time when fishing effort and catch increased greatly. This relatively stable pattern of recruitment and CPUE declining only slightly, as a function of increasing fishing effort, indicate that the eastern fishery is having minimal, if any, effect on recruitment to the population.

Catch-Per-Unit of Effort

Catch-per-unit of effort (CPUE) data were collected and analyzed for use as indices of population size (Docs. 16, 35, 45). Two kinds of CPUE data from the eastern Atlantic fishery were reviewed: (1) data from baitboats (pole-and-line) fishing in a limited area off Tema, Ghana, and (2) data from purse seiners fishing throughout the eastern Atlantic:

	Japanese BB		*Transformed and Standardized Purse Seine CPUE*[1]						
			Mixed Catch[2]			*70 o/o or More SKJ Catch*			*Skipjack*
Year	*(Doc. 17)*[3]	*(Doc. 45)*[4]	*SM FIS*	*GS FIS*	*GS USA*	*SM FIS*	*GS FIS*	*GS USA*	*GS Spain*
1969	--	4.2	2.2	1.6	3.2	1.7	--	1.8	4.2
1970	(6.4)*	6.0	2.6	3.4	4.2	2.2	2.2	2.0	2.8
1971	(7.8)*	6.9	2.2	3.3	2.8	2.5	2.1	3.8	3.7
1972	6.2	5.9	2.6	3.0	2.5	2.1	4.8	1.4	4.7
1973	4.7	4.2	2.1	1.6	4.1	3.6	3.7	7.1	3.4
1974	5.2	4.9	2.1	2.8	2.9	4.8	6.2	4.5	5.0
1975	5.8	4.8	2.6	2.3	2.1	1.7	1.5	1.6	2.1
1976	4.9	5.3	1.9	3.3	4.3	2.0	--	3.6	1.6
1977	5.1	5.5	2.8	4.9	4.3	4.3	3.5	0.8	2.4
1978	5.4	6.4	3.0	3.9	2.5	3.0	1.4	1.1	1.9
1979	5.4	7.1	2.9	2.8	1.3	2.8	1.6	1.7	1.3
1980	4.8	6.3	6.0	2.4	1.1	--	2.8	0.7	2.1
1981	6.5	8.6	4.4	2.3	2.2	3.9	2.7	2.7	2.2

SM = medium seiners, GS = large seiners, FIS = France-Ivory Coast-Senegal.
1 See Doc. 17, Table 7b, revised.
2 Yellowfin and skipjack.
3 Table 19, revised.
4 Table 3.
* Estimates are from extrapolation of trends in data series.

The two series of baitboat CPUE's are from different sources and do not show the same trends, possibly due to the method in which the data were adjusted for changes in fishing pattern, measurements of fishing effort and species composition of the catch. These indices might represent changes in abundance of skipjack tuna in the Tema area only or abundance of recruits in the region, rather than abundance of the total population in the entire eastern Atlantic.

The purse seine CPUE is from vessels that fish throughout the eastern Atlantic in all seasons when skipjack tuna are available and has been standardized to large FIS seiners (GS FIS). The vessels, therefore, sample a larger fraction of the skipjack population and their CPUE's might better reflect population changes for the entire region. Taken together, the CPUE's of purse seiners show a slight decrease since the mid-1970's.

CAN SKIPJACK TUNA CATCHES BE INCREASED ON A SUSTAINED BASIS? (Panel I)

This question has been partly answered during the ISYP by the development of new fisheries in many areas (e.g., off southern Brazil) and expansion of existing fisheries (e.g., Venezuela). This is shown by a comparison of skipjack fishing areas in the Atlantic Ocean

in 1975-1978 (Fig. 3), immediately before the start of the Program, with fishing areas in 1979-1981 (Fig. 4), during the ISYP. The total Atlantic catch in 1978, immediately before the ISYP, was 108,000 MT. In 1982, the end of ISYP, it had increased by nearly 40 percent to 150,000 MT.

Further increases in catches are possible with application of increased fishing effort as described below.

Increasing Fishing Effort in the Traditional Fishing Areas

Eastern tropical Atlantic

Skipjack are characterized by fast growth, high natural mortality, high fecundity, and early maturation. In addition, they are most vulnerable to fishing gears only for one or two years during their life. Tagging experiments showed a rapid reduction of tag recovery rates with time, in the eastern tropical fishery, and the scarcity of large-sized (over 55 cm long) fish. This suggests rapid loss of fish by attrition. Given this situation, it seems that catching as many skipjack as possible before they become unavailable to the fishery will produce a better yield. For example, the fisheries off Angola catch almost exclusively small skipjack and currently produce much less than the historical level of 25-30,000 MT yr^{-1}. If the catches in the Angolan area were to increase substantially, there might be some reduction of the catch in the Gulf of Guinea, as the result of less fish entering the Gulf from the Angolan area, but the overall catch of the eastern Atlantic would likely be higher.

The CPUE of purse seiners and baitboats does not indicate that the production is nearing the maximum sustainable level. The panel concluded that an overall increase in catch can be realized by increasing fishing effort in the current fishing areas.

As the fishery for skipjack in the Gulf of Guinea also catches yellowfin and bigeye tuna, an increase in skipjack catches will also increase the amount of small yellowfin and bigeye caught with them. The catch levels of these other species appear to be higher than that of skipjack relative to their stock size, and the effect of increased catches of small fish could be detrimental to the status of these stocks. The interaction of different species in the fishery is a subject under study by the SCRS Working Group on Juvenile Tropical Tunas.

Catches in different areas may be limited by different factors. In the area of the Cape Verde Islands, the catch potential seems to be high, based on fishing information from the adjoining area off Senegal, but the seasonal fluctuation of the bait supply in the Cape Verde Islands is apparently preventing further increase in baitboat catches. Introduction of other fishing methods which are not dependent on bait (e.g., purse seining) may permit catches to increase further. A sustained high catch from the Azores Islands area may not be possible because this area is at the northern margin of the skipjack distribution, and skipjack occurrence is seasonal and quite variable between years. In the waters near the Canary Islands, skipjack are abundant in spring and summer, but the low price of skipjack relative to other species appears to be the factor limiting expansion of the catches.

Western Atlantic and Caribbean Sea

The fishery off Cuba has been expanding but further expansion of this baitboat fishery will be limited by the bait supply. It seems that the skipjack resources are abundant around Cuba, and catches could be increased with increased fishing effort.

Expanding Current Fisheries Into New Areas

Southeast Coast of Brazil

A baitboat fishery started in the waters off southeast Brazil in 1979. Catches increased rapidly but leveled off in 1982. Further growth of the fishery is possible since there is no sign that the catch has reached the maximum. Expansion of the fishing area (probably to the east and north), which might also permit catching of smaller fish, may increase the catches substantially.

Caribbean Sea and Gulf of Mexico

The area off Venezuela has been moderately exploited by local fisheries for many years, Since 1980, Venezuelan purse seiners have expanded fishing off the Caribbean and western Atlantic coasts of Venezuela. Their tuna catch increased sharply with this expansion and also through use of improved fishing techniques.

In the Caribbean and Gulf of Mexico, several exploratory fishing cruises have been made, and there have been many sightings of skipjack schools. Vessels, such as U.S. purse seiners, have reported only sporadic catches in the area while enroute to ports or fishing areas. These data indicate, however, that fish are present in the region for development of new fisheries.

Catching Large-sized Skipjack and Developing New Fishing Techniques

Catch and tagging data indicate rapid disappearance of large skipjack from the eastern Atlantic fisheries. The reason for this attrition is still unknown. If mortality is high, then large fish simply could not be abundant. However, if the attrition results from emigration of fish, then the large fish (over 55 cm long) should be somewhere outside the conventional fishing area, or they may simply be unavailable to the fishery though still in the same area. Provided they have not died, these fish offer a potential for increase in catches.

Evidence that at least some large skipjack survive in waters far beyond present fishing grounds comes from the longline fishery. This fishery operates throughout the Atlantic and catches large skipjack incidentally to the target species. However, the density of large skipjack may be low, considering the large area of the Atlantic and low frequency of encounters by longliners, and hence, may not warrant fishing with present techniques and methods. Even an expansion of the present eastern fisheries into the area immediately west does not appear to be achievable without development of a new fishing technique since purse seining has rarely been successful in that area. Environmental conditions (deep thermocline) in that area are not conducive to successful purse seining.

One means of making large fish available to surface gears in such areas might be with the use of fish aggregating devices. In the eastern Atlantic, many successful purse seine sets have been made on skipjack schools associated with floating objects. It is possible that floating, aggregating devices, deployed by fishermen, can duplicate the association phenomenon and make large-sized fish available to capture. The panel heard that the recent rapid increases of the skipjack catches in the South Pacific Ocean are the partial results of fishing skipjack associated with flotsam and with other aggregating devices.

Venezuelan purse seiners are operating together with baitboats in the Caribbean Sea to increase their effectiveness. The technique involves the baitboat aggregating and holding the school by chumming while the purse seiner sets its net around the school and baitboat. The panel concluded that large fish could be made available to the fishery through the development of new fishing techniques and possibly with deployment of aggregating devices.

WHAT WILL BE THE EFFECTS OF INCREASED CATCHES ON THE SKIPJACK TUNA RESOURCE? (Panel II)

This question was answered after a review of ISYP results (see Review of Research Results). Information reviewed by the participants indicates that skipjack tuna are characterized by a highly opportunistic life strategy: (1) the stock structure does not appear to be of many small isolated units; (2) spawning which takes place over broad geographic regions and throughout most of the year; (3) high fecundity and rapid growth and maturation; (4) an ability to migrate over long distances. These opportunistic features allow for very high productivity with rapid turnover of biomass.

Current catches apparently have not reduced the population sufficiently to adversely affect recruitment. Moreover, analyses show that higher rates of fishing should increase yields without seriously affecting either the population or recruitment. However, increased effort might produce ancillary problems for the fisheries.

For instance, there is some evidence of competition between fishing gears. That is, exploitation of a cohort by a unit of fishing gear can reduce the ability of other units of gear to catch fish from that cohort at subsequent times and in other areas to which fish of that cohort may migrate. Such competition might be reduced by allocating the increased fishing effort to areas or times other than those of the current fishery.

An additional problem arising from increasing catches of skipjack tuna in the eastern Atlantic is the effect on juveniles of other tuna species, principally yellowfin and bigeye tunas. Juveniles of these species are frequently caught together with skipjack tuna. These other tuna resources may be less able than skipjack to withstand increased fishing pressure because of different life-history strategies, yield-per-recruit relationships and current high exploitation rates.

In summary, the panel concluded that it is very likely that the Atlantic skipjack tuna resource is not adversely affected by recent levels of fishing and that it can support an increase in catch. However, the associated effects of an increased skipjack catch could be an increase in intensity of competition among units of fishing gears, increase in catches of young yellowfin and bigeye tunas, and a reduction in abundance of yellowfin and bigeye tuna stocks.

HOW CAN SKIPJACK TUNA ASSESSMENTS BE IMPROVED? (Panel III)

In this section, the data requirements for improving or augmenting existing knowledge are reviewed and recommendations for further work are made.

The Fisheries

Catch data

Participants in the fisheries have greatly improved their reporting of catches. However, considerable uncertainty remains about the total catch of skipjack tuna in the Caribbean. There are also discrepancies in catch and landing statistics from different sources for the international fleet that unloads at Tema, Ghana.

To correct these problems, it was recommended that the Secretariat continue investigations to obtain accurate tuna catch statistics for the entire Caribbean fishery and that Japanese and Korean scientists in collaboration with Ghanaian scientists investigate procedures for correcting the discrepancies for unloadings at Tema.

Effort data

Spanish and French observers collected detailed fishing-operations data during the ISYP which will improve the interpretation of effective fishing effort. Although scientists are continuing to examine the information and full results are not yet available, it was noted that continuing the observer program would be beneficial to future data collection and analysis. Hence, it was recommended that the observer program be continued, even if at a reduced level. In addition, the participants recommended that selected vessels be contacted and requested to record detailed fishing-operations information in a logbook.

For the western Atlantic, very little fishing effort data are available for the different fleets. So far, the only comprehensive effort data are for the Brazilian and U.S. fleets. The participants recommended that the Secretariat continue current efforts to secure the missing information.

CPUE Information

Analyses so far have not shown a relationship between CPUE and skipjack abundance. However, further studies using all available data are needed to investigate whether CPUE information will or will not measure abundance. The panel recommended that analyses be conducted using CPUE data to estimate relative fishing powers of the different fleets that participate in the eastern fishery, and that the potential of CPUE information as an indicator of recruitment in the Gulf of Guinea be investigated.

For the western Atlantic, since there is little CPUE information, the panel had only one specific recommendation, that data collection be improved.

Size data

Biological sampling received high priority during the ISYP with expanded coverage of many fisheries. Except for some areas such as the Caribbean and around St. Helena Island, biological data from observers and/or port samplers were collected. Analyses of the data are not yet completed. The panel noted that samples from minor fishing areas, such as around St. Helena Island, would be of interest.

The panel recommended that analyses be continued and that researchers compare the samples (including yellowfin and bigeye) obtained by observers and port samplers from the same catches. It also recommended that the optimal level and the pattern of coverage necessary to sample the Atlantic catch adequately be investigated.

The panel also recommended that the Secretariat continue with the inititative to collect biological data from the Caribbean catches and to expand this initiative to increase coverage.

The Fish

Maturity, Fecundity and Spawning

The ISYP has significantly improved available information on the reproductive biology of skipjack tuna, but there were no data, other than some larval occurrence data for the Gulf of Mexico and the Caribbean Sea and the adjacent Atlantic areas. Data coverage is weak for the mid-oceanic and Congo-Angola areas. Questions that still need addressing include how frequently do individuals spawn (i.e., total egg production during a year); and do larvae drift from the presently defined spawning areas in the equatorial area towards the area off northeast Brazil. The panel recommended that further studies to address these questions be conducted.

Growth

Analyses of ISYP tagging data provided evidence of seasonal and regional variation in growth rates. Use of a single growth curve for describing growth of fish in all areas does not, therefore, appear to be valid. The panel called for additional studies to investigate the variability among growth rates for fish from various regions, such as parts of the western Atlantic and off Angola, and within regions and between seasons.

Recent work on ageing using finray sections suggests that this is not a promising approach for age determination of skipjack tuna. The panel recommended that studies on this ageing technique not be pursued.

Natural mortality

Procedures for obtaining an accurate estimate of natural mortality rate (M) for skipjack tuna are expensive and currently have a low potential for success. Detailed investigation of natural mortality rate is consequently considered not justified. Studies of pre-

dation and distribution of young (including size composition) as well as studies of factors affecting survival of recruits (which implies improving sampling techniques) might be undertaken to provide more information on causes of natural mortality.

Environmental factors

It is believed that environmental factors have a major impact on skipjack tuna abundance. Further work is required on environmental causes of variation in distribution (both vertical and horizontal), apparent abundance and recruitment. Possible methods that should be considered are use of sonic tagging, energetics in relation to food supply and analysis of the relationships between fishing success and oceanographic conditions.

Stock structure

Studies on stock structure of Atlantic skipjack tuna have so far provided no definitive basis for partitioning the resource into small units, except possibly into eastern and western Atlantic management units. More tagging experiments are needed. The panel recommended experiments be conducted off Angola in the first and fourth quarters of the year, in the Gulf of Guinea during the first and fourth quarters (ISYP tagging was during the second and third quarters), off Liberia in the fourth quarter, off the Canary and Azores Islands and throughout the western Atlantic, with tagging off southern Brazil having priority. The panel also recommended that an analysis be performed to investigate whether the ISYP level of tagging in the eastern Atlantic was in fact high enough to generate a reasonable probability of tag recovery in the western Atlantic, where fishing mortality appears low. This analysis could explain whether the lack of recaptures in the western Atlantic is statistically significant or not.

The ISYP tagging produced some data for analyses to determine rates of transfer of biomass between geographic areas that might be designated as management stock units. However, because the tagging was not designed for this purpose, the panel noted that a more complete understanding of transfer rates will require a specifically designed tagging program that takes into account timing, areas and sizes of fish involved in the transfer.

Fishing mortality

Estimates of fishing mortality rate (F) have been derived from ISYP tagging data using both the rate of recapture and cohort analysis methods. The estimates, however, are confounded by inclusion of other factors such as the emigration rate. The panel noted the importance of improving the estimates of fishing mortality and recommended that the analyses include the use of size- rather than age-structured models.

Stock Assessments

Models

Both cohort and production model analyses have so far been employed in analysis of the ISYP data base, but refinements to the analyses should be pursued. The panel

recommended that future analyses account for differential growth rates or age-size relations, investigate the use of size- rather than age-structured models, account for migration by segmenting the data into geographic and temporal units; and tests for sensitivity of models to errors in values of the input parameters and violation of assumptions.

Assessment of potential for increasing catch from existing fishing areas

The problems associated with increasing the catch of skipjack tuna from existing fishing areas were mentioned in the section on What will be the effects of increased catches on the skipjack tuna resource? Studies that can provide additional information on potential impacts and procedures for avoiding the problems include modelling exercises that investigate increases in catches through increasing effort on small skipjack (e.g., off Angola) or on large fish, should they prove feasible to catch; increasing availability of fish through deployment of aggregating devices; and concentrating fishing in certain areas where skipjack occur more frequently in pure-species schools, such as off Angola and around the Cape Verde Islands. The principal goal is to avoid the simultaneous catching of small yellowfin and bigeye tuna that frequently school with skipjack tuna. Areas where mixed schools occur can be identified from analysis of catch composition of single set data. Although aggregating devices tend to attract mixed schools, this should not deter efforts to utilize aggregating devices as a means for increasing skipjack catches. If there is a species difference in behavior (e.g., vertical distribution under an aggregating device, reaction to stimuli, or diurnal behavior), it should be possible to take advantage of the difference and reduce the involvement of young yellowfin and bigeye tunas in the catch. Currently there are studies being carried out off Hawaii that should provide information on behavior of schools attracted to aggregating devices, and the panel recommended that such research be encouraged.

Assessment of the potential for increasing catches from newly exploited and new areas

Information on skipjack potential in new areas is scant. The Brazilian fishery expanded as a result of construction of offshore oil platforms (which acted as aggregating devices), but there may be concentrations of fish there that are not presently being detected by the fishermen. There are some reports of catches of skipjack by baitboats around St. Helena and Ascension Islands and scattered reports of catches by longline fishermen in the mid-Atlantic. These reports need to be pooled and analyzed in greater detail. Longline operations, since they cover a large part of the ocean, might detect skipjack tuna concentrations if quantities of shallow, small-hook longline gear are deployed in association with regular commercial operations. The panel recognized that exploration of new fishing areas will require properly designed and executed fishing ventures and is expensive.

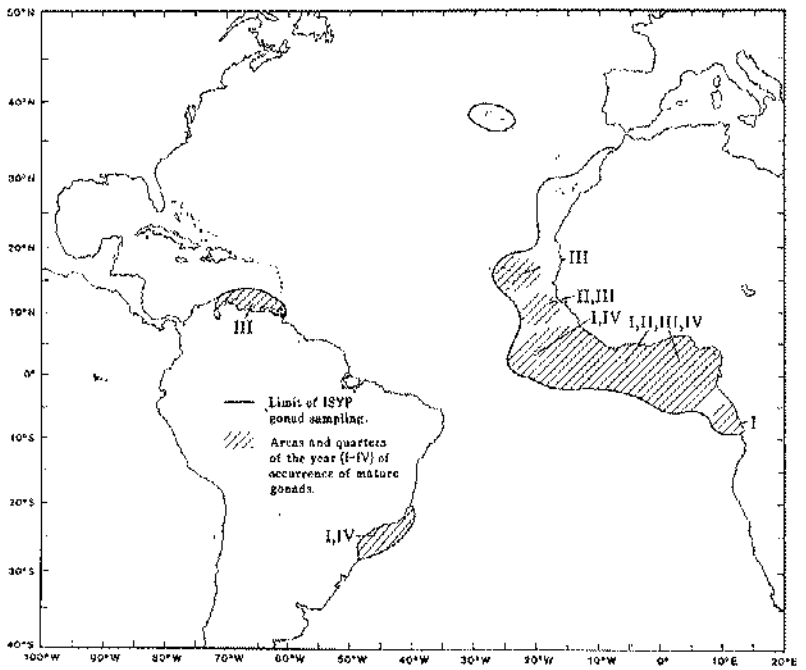


Fig. 1. Areas in the Atlantic Ocean where gonad samples were collected during the ISYP. Areas and quarters of the year (I = January, March, II = April-June, etc.) when mature fish were found are shown.

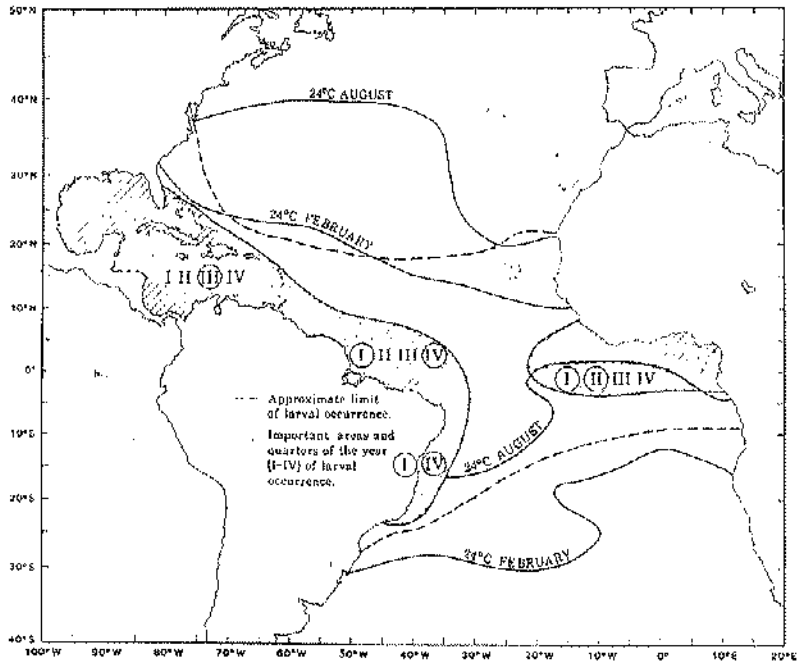


Fig. 2. Limits of the distributional range on skipjack tuna larvae in the Atlantic Ocean. Areas and quarters of the year (I = January-March, II = April-June, etc.) when larvae are most often found are shown. Quarters of the year of major larval occurrence are circled.

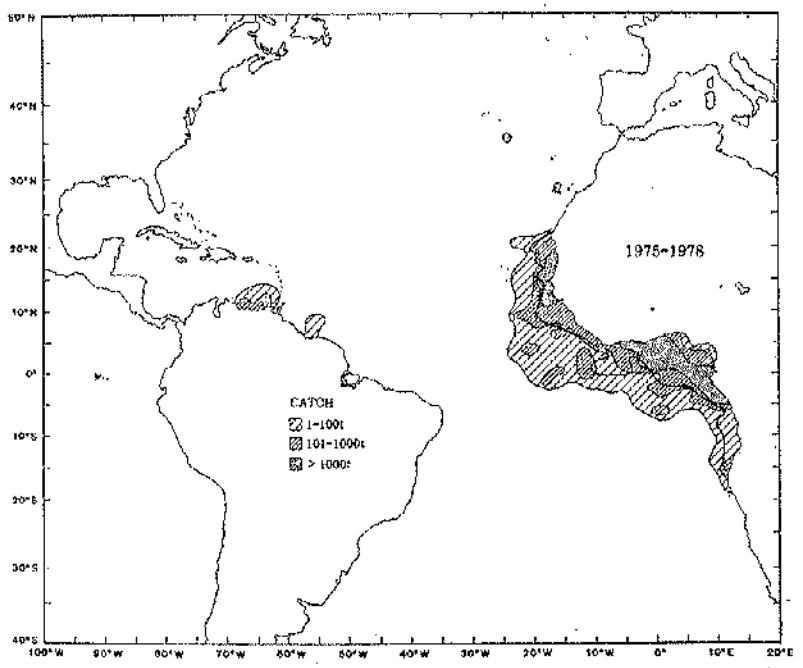


Fig. 3. Distribution of skipjack catches in the Atlantic Ocean, 1975-1978. Catches for some fisheries, such as for Cuba and Venezuela, are incomplete.

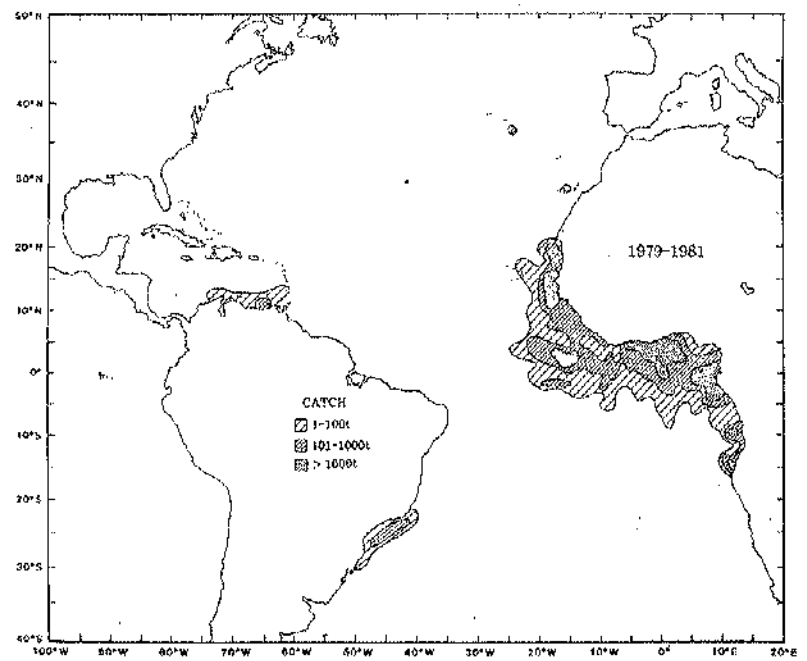


Fig. 4. Distribution of skipjack catches in the Atlantic Ocean, 1979-1981. Catches for some fisheries, such as for Cuba and Venezuela, are incomplete.

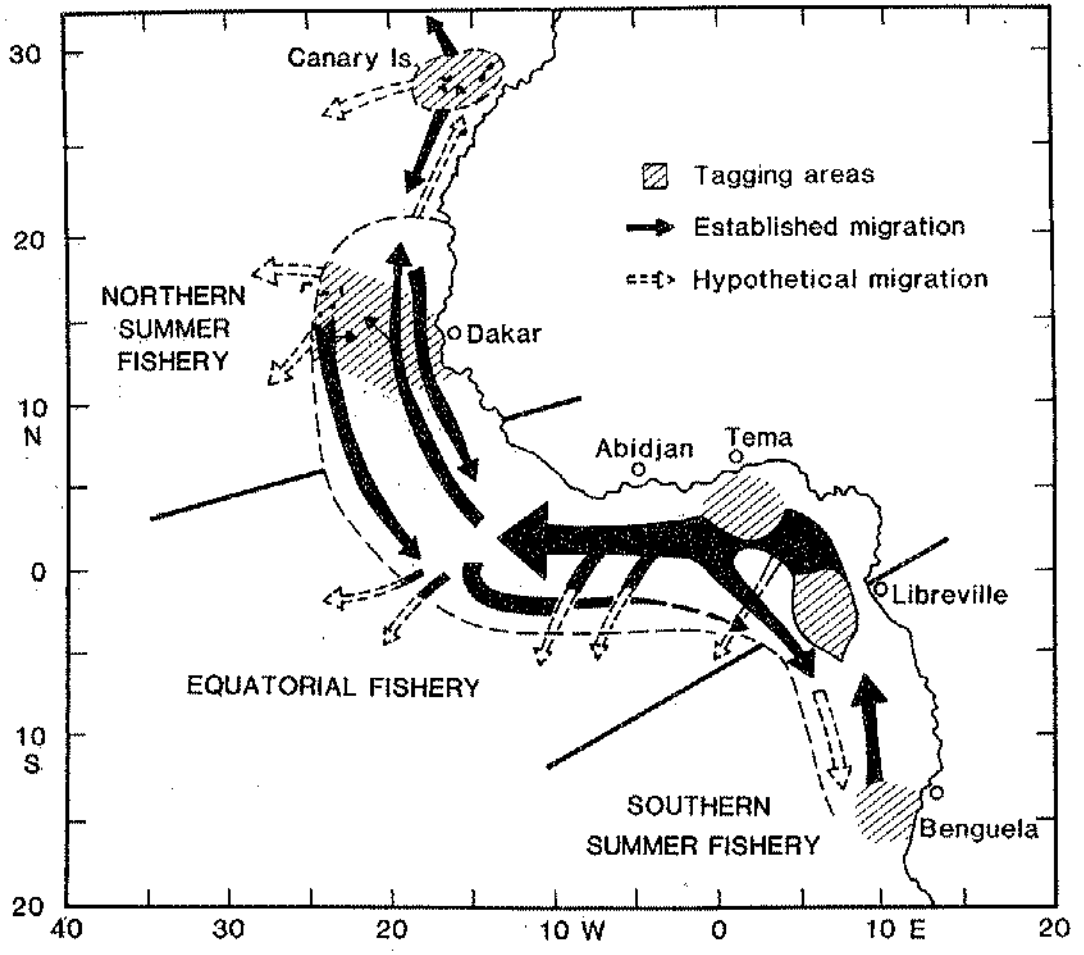


Fig. 5. Migration pattern for skipjack tuna in the eastern tropical Atlantic from ISYP tagging experiments. Solid arrows depict observed movement of fish from tagging areas. Open arrows depict possible movements, not yet confirmed by tagging.

Appendix 4 to Annex 10

REPORT OF THE WORKING GROUP ON JUVENILE TROPICAL TUNAS

The meeting was opened on November 6, 1983, by the Convener of the Working Group, Mr. J. B. Amon Kothias. Dr. F. X. Bard was appointed rapporteur.

The report of the previous meeting, held during the Skipjack Conference in June, 1983, was submitted for approval (Addendum 1). A slight modification was made on the description of objectives of the Group, and the report was adopted.

One of the major tasks recommended in the above-mentioned report was to correct the Task II and size frequency files of the Tema-based baitboat, FISM and Spanish fleets. In order to best accomplish these tasks, the Convener invited the scientists responsible for these different fleets to a preparatory meeting to standardize the processing procedures, make corrections and revise data available on these fleets. The objectives of this preparatory meeting, whose necessity is evident for the concerned scientists, are shown in Addendum 2.

The corrected data (item 3a and b) of the Agenda should be sent to ICCAT so that the data base will be available for any interested country by March, 1984.

After agreeing on the need for such a meeting, the date, place, and number of participants were discussed, as well as whether it may be a formal ICCAT meeting.

It appeared that Dakar would be the most appropriate place because of its central location and the availability of computer facilities. The meeting would be held at the end of January, 1984.

Its being a formal ICCAT meeting was questioned in terms of the need to limit participation. Senegal, the host country, noted that it has very limited meeting facilities. The Convener pointed out that the work would require only the scientists responsible for the above-mentioned fleets.

ICCAT, upon formally sponsoring this meeting, must furnish financial aid to cover the expenses of material, travel and per diem for one scientist (from Ghana) and the Convener, whose presence is essential. In addition, attendance by the systems analyst and the Assistant Executive Secretary or biostatistician was requested. Assistance provided by these two members of the Secretariat would be valuable.

The Executive Secretary noted that if the SCRS approves such an ICCAT meeting, he would fully collaborate.

After considerable discussion, it was agreed to recommend to the SCRS that this preparatory meeting in Dakar, with the conditions mentioned above, be held.

The date and place of the final meeting were then discussed. The Group agreed that this meeting would be held at the beginning of July, 1984, but some time after July 7 so there would be no conflict in dates with the World Conference on Fisheries organized by FAO to be held in Rome up to that date. The dates of July 9-18 were proposed.

The location of the meeting is restricted to Madrid or Brest, although it cannot yet be decided. The Group recommended that contacts be made with the French delegation during the Commission Meeting, or if necessary, by mail, in order to reach a rapid decision.

A tentative agenda for the July, 1984, meeting was proposed for consideration. Comments on this agenda are expected later by correspondence.

The report was adopted.

The meeting was adjourned.

Addendum 1 to Appendix 4 to Annex 10

REPORT OF THE WORKING GROUP ON JUVENILE TROPICAL TUNAS
(Tenerife, Spain, June, 1983)

The Working Group met on June 28, 1983, at the I.E.O. laboratory in Tenerife. The meeting was opened at 3:30 p.m. by the chairman, Mr. J. B. Amon Kothias. Dr. F. X. Bard was asked to serve as rapporteur.

The Group examined the progress made on the studies of juvenile tropical tunas. The chairman congratulated all the scientists present for the considerable advances made on skipjack tuna. He recalled the objectives assigned at the Group's last meeting held during the 1982 SCRS meeting (Addendum 1 to Appendix 6 of the SCRS Report).

It is apparent that:

– Certain biological parameters for yellowfin and bigeye still need to be reviewed (growth, stock structure). Individual scientists will be responsible for these studies.

– The data bases for the fleets operating in the east Atlantic need to be revised because of certain biases detected recently. It is basically a matter of confusing the young yellowfin and bigeye with skipjack in the commercial reports of the FISM fleets and the Tema baitboats. For the Spanish fleet, it seems that young bigeye are often taken as yellowfin.

To resolve this situation, it was decided to proceed with a general revision of size frequencies (weighted and extrapolated) by 5^{o}x5^{o} square and by month. This will be done under the responsibility of:

A. Fonteneau for the FISM fleet,
A. Fernández for the Spanish fleet, and
P. Miyake for the Tema baitboat fleet and minor fleets

The deadline for this work has been set for March, 1984, which would allow sufficient time before the next meeting of the Working Group, at which time alternative strategies should be proposed to protect young tropical tunas.

Studies on mixed-species (yellowfin, bigeye and skipjack) schools were reviewed. These studies contribute to knowledge of the ecology and eventual fate of mixed schools. They will influence the choice of areas and dates for possible closures of the fishery in the inner Gulf of Guinea.

Also, knowledge of the relationship between such mixed schools and floating

objects, artificial or not, is important. The use of artificial floating attractions was mentioned at the Skipjack Conference and seems promising. However, their incorrect usage in the Gulf of Guinea risks creating an increasing mortality of juvenile tunas if the relationship with floating objects turns out to be strong and constant.

These studies are recommended, and collaboration between researchers working on the FISM and Spanish fleets is now well underway.

Complete analyses of the state of stocks for yellowfin, bigeye and skipjack, multispecies analyses and simulation models taking into account the three species and fine strata (5°x5°) are left to the individual initiative of the scientists concerned, who should prepare these analyses from the data base to be revised in March, 1984.

It is evident that a great number of analyses must be carried out at the next meeting of the Working Group and this limits the place and date of the meeting. The research centers in Brest and Dakar were mentioned at the preceeding Working Group meeting, but the Secretariat indicated that to date no formal invitation has been received.

The Secretariat was put in charge of making the arrangements for the meeting and contacting the governments concerned. The representative from Senegal stated that the meeting capacity of the Dakar center is limited to 15 persons. This restricts the choice to Brest, and if this is not possible, it is still feasible to hold the meeting in Madrid.

Concerning the date, the chairman stated that the best time would be the first part of July, 1984, which leaves reasonable time from March, 1984, to complete the studies. Correspondence on this subject should be carried out between concerned persons before the November, 1983, SCRS meeting. At that time the date and place of the next meeting of the Working Group on Juvenile Tropical Tunas will be set.

The meeting adjourned at 4:40 p.m.

Addendum 2 to Appendix 4 to Annex 10

PLAN FOR THE PREPARATORY STATISTICAL MEETING ON JUVENILE TROPICAL TUNAS

1) Date and place: Last week of January, 1984, in Dakar, Senegal (pending approval by the Senegalese authorities)

2) Countries concerned with the agenda items: France, Ivory Coast, Senegal, Morocco, Spain, Ghana or other possible interested countries. The meeting will not have translation.

3) Agenda

a) FISM and Spain: –Develop a processing system for sampling and logbook data pursuant to an unbiassed estimate of Task I, Task II and raised size frequency data for yellowfin, bigeye and skipjack tuna.

–Develop procedures to correct the historical data.

–Correct data files from previous years (1969-1982) so that the SCRS scientists will have an improved historical series available to them, i.e., Task I, Task II and raised size frequency data for the three species (by 5ºx5º area and by month).

b) Tema-based baitboats: –Compare the species composition and size frequencies of Tema-based baitboats provided by various sources (Ghana, national offices, Puerto Rico).

–Select a single data series (Task I, Task II and size frequency) which should serve as a base for the Working Group on Juvenile Tropical Tunas in July, 1984.

c) Develop a data file on the composition of the schools and a method to process these data.

Addendum 3 to Appendix 4 to Annex 10

TENTATIVE AGENDA FOR THE MEETING OF THE WORKING GROUP ON JUVENILE TROPICAL TUNAS
(July 9-18, 1984)

1. Review of statistics
   –Review and discussion of revised statistics on three species (yellowfin, bigeye and skipjack) for the major fleets

2. Review of size frequencies
   –Review and discussion of revised size frequencies for the three species

3. Review of the time-space distribution of catches (and CPUE) of young yellowfin and bigeye and the combined catches (and CPUE) of yellowfin, bigeye and skipjack (5º/month)

4. Time-space analysis of the single school composition (by size)

5. Review of catch-by-age
   –Review of growth equations considered (yellowfin, bigeye and skipjack)
   –Review of methods of estimating catch-by-age from catch-by-size (yellowfin, bigeye and skipjack)
   –Review of catch-by-age and catch-by-gear matrices (yellowfin, bigeye and skipjack)

6. Review of cohort analyses (yellowfin, bigeye and skipjack) and of fishing mortality rate (by gear)

7. Analysis of yield-per-recruit (Ricker model) for each of the three species, by multi-gears

8. Models of the multi-specific and multi-gear fisheries (yellowfin, bigeye and skipjack)
   - Critical review of revised analytical models (multi-gear, multi-species and in non-equilibrium conditions)
   - Sensitivity studies on these models for errors in basic parameters

9. Alternative fishery management
   - Evaluation of alternative fishery strategies to reduce fishing mortality on juvenile yellowfin and bigeye, taking into account the potential for increase in skipjack production
   - Simulations of consequences results of the proposed fishing strategies (estimates by gears used and CPUE by size and species)

NOTE: The Group should have available suitable data processing facilities to be able:
   - to execute again, if necessary, the basic calculations (for example, cohort analyses), and
   - to make interactive processing of all the sensitivity analyses and projections that the Group considers necessary.

Appendix 5 to Annex 10

REPORT OF THE SUB-COMMITTEE ON STATISTICS

Item 1. Opening of the meeting

The meeting was held in Madrid, Spain, at the Hotel Princesa Plaza, on November 5, 1983. Dr. G. T. Sakagawa served as Convener of this session of the Sub-Committee, in the absence of Mr. Z. Suzuki.

Item 2. Adoption of Agenda and arrangements for the meeting

The Tentative Agenda was adopted without change and is attached as Addendum 1. Dr. P. M. Miyake (Secretariat) was nominated rapporteur.

Item 3. Examination of progress made by national offices

and

Item 4. Examination of the problems of the quality of statistics and promptness of reporting

These two Agenda items were discussed together. The Secretariat Report on Statistics and Coordination of Research (SCRS/83/22, hereinafter referred to as the "Secretariat Statistical Report"), was reviewed as to the progress made by the national offices in the collection of data. A summary is given in Table 1.

Item 5. Examination of progress made by the Secretariat

The pertinent section of the Secretariat Statistical Report (SCRS/83/22) was reviewed. The Sub-Committee also reviewed document SCRS/83/24 which studied the data available in the ICCAT data base from various fisheries. Document SCRS/83/27 presented an analysis on the fishing power indices of various fleets. This document proved useful to the species working groups. Document SCRS/83/18, regarding the statistical training courses carried out in 1983, was reviewed.

The Sub-Committee expressed its satisfaction at the progress made by the Secretariat and the national offices, but it also identified various problems which are having serious effects on analyses as research advances.

Item 6. Data preparation for juvenile tropical tuna work

The Report of the Working Group on Juvenile Tropical Tunas (Tenerife, June, 1983) was reviewed in terms of the statistical implications contained therein. The Sub-Committee was informed that progress is being made in updating catch-by-size tables and in the compilation of single set data, and that the data base for the FISM, Tema-based and Spanish fleets will become available before the deadline set for this work.

In this respect, the Secretariat proposed that, if necessary and if practical, a Ghanaian scientist could be invited to Madrid to work with the Secretariat staff in completing the statistical assignments. This proposal was supported by a number of delegates. The Convener of the Sub-Committee proposed that this work strategy be expanded to include the FISM and Spanish fleets, i.e. a scientist working on each of these fisheries could also be invited to the Secretariat to complete the assignment to set up a common data base which should be made available to all interested scientists. Since this subject is closely inter-related with the working schedule of the Working Group on Juvenile Tropical Tunas, which is meeting later in this session, the Sub-Committee agreed to forward this proposal to the SCRS for decision.

Item 7. Review of the processing of bluefin catch-by-size tables

The procedures adopted and carried out during 1983 in updating a common bluefin data base were explained and reviewed with reference to the two meetings held on this subject (SCRS/83/15). The Sub-Committee found that even though major problems have been solved, there are still problems to be solved, as follows:

a) Improvements needed in Italian bluefin tuna data

Following a recommendation made by the Workshop, the Secretariat presented an estimated budget for a contract to study the data problems. After reviewing all possibilities and the estimated budget, the Sub-Committee recommended that:

i) The Secretariat proceed in its efforts to request that the Italian Government continue the biological sampling program in 1984 and future years. However, if this fails and it is found that no sampling is being carried out during the 1984 season, the Secretariat is authorized to take emergency action (limited only to 1984) to contract a local sampler to carry out a minimum level of sampling of the major fisheries.

ii) As regards past statistics, the Secretariat should proceed in its efforts to clarify the discrepancies in the data series sets, in cooperation with various scientists. Some minimal expenses may be associated with this work. No attempt should be made to discover new historical data.

iii) If the cost is reasonable and acceptable, the Secretariat may–budget permitting–contract a private organization to prepare a rough estimate of the magnitude of the catches of Age-0 fish in Italy. It was noted that this type of investigation is difficult for a government agency to carry out.

b) Simultaneous updating of the bluefin data base among various nations

It is expected that updating and improvement of the common data base, which is now done by various scientists, will continue. Changes made by any scientist should be notified to all the other scientists concerned.

c) Partitioning of the catch-by-size data base into months (or quarters)

The data base which has been temporally assigned by seasons has to be reviewed critically; seasonal information should be further refined and disseminated.

In order for all the scientists to be able to improve the common data base and keep it common among them, the Sub-Committee recommended that a working group on bluefin statistics be organized. Suggested member countries and correspondents are as follows:

Canada	T. R. Hurlbut
Cuba	B. García Moreno
France	B. Liorzou
Italy	C. Piccinetti, R. Sara, P. Arena (as collaborators)
Japan	S. Kume
Morocco	M. El Ahdal
Portugal	J. Pereira, L. Gouveia
Spain	J. L. Cort
U.S.A.	M. L. Parrack

The Group should be open to participation by other interested countries.

Item 8. Evaluation of the need for a micro-computer

Document SCRS/83/23 was reviewed. This document dealt with a study on possible improvements in the efficiency in the Secretariat's work through the introduction of a micro-computer system with word processing functions. The Sub-Committee discussed the possibility of taking advantage of such a system to improve the efficiency of data management and analyses. It noted that management of the data base at the current level could be achieved more efficiently and cost effectively with INFONET (the current system) than by buying a new mini-computer. On the other hand, a less powerful system which is under consideration may facilitate the scientific analytical work at future meetings. The Sub-Committee recommended that if such a system were to be purchased, it is hopefully a model which could be upgraded and/or have graphic facilities in the future.

Item 9. Future plans to improve statistics, and recommendations to the SCRS

Recognizing the various problems of quality control of the data entering the ICCAT data base and the uncertainties about the procedures adopted by the national offices in producing fishery and biological data, the Convener proposed that each nation study these problems during the next year and that a day at the next SCRS session be set aside to report the national procedures of data collection and compilation and to review and compare these results.

The results of such a meeting would provide the Sub-Committee with a base to develop criteria or guidelines for acceptable fisheries and biological data in the future. Having agreed to this proposal the Sub-Committee forwarded it to the SCRS for consi-

deration. Mr. P. Cayré (Senegal) was asked to coordinate such a study and to prepare a very specific format with which each scientist could prepare his report on the procedures he follows for presentation at the possible full-day session at the next SCRS session.

Some doubt was raised as to the need to continue ICCAT port sampling from longline catches landed at Atlantic ports, noting the marked improvement made in biological and logbook data for those fisheries by Taiwanese and Korean scientists. On the other hand, new problems have arisen because of an increase in joint venture fishing whereby the responsibility for collecting data is somewhat vague. Some ICCAT funding might become necessary to assure adequate sampling coverage from these fleets. The Sub-Committee recommended that the Secretariat do a feasibility study on the need of the current port sampling program for longliners as well as on the possible statistical coverage of such joint venture fleets, specifying the area and magnitude of the problems.

Also discussed was whether or not a permanent post of biostatistician is necessary. On one hand, many funding requirements were identified for various statistics and research activities, and many of the biostatistical assignments could be more efficiently carried out by short-term contracts with scientists in each specific field. This view was supported at the SCRS Officers Meeting held in Tenerife in June, 1983 (SCRS/83/7). However, differing views were expressed during the Sub-Committee's meeting and a Working Group, chaired by Dr. J. J. Maguire (Canada), was established to identify biostatistical assignments and advise the Sub-Committee on the need for the biostatistical position. It concluded (Addendum 2) that the ever-increasing biostatistical assignments to the Secretariat require at least one permanent biostatistician's position plus funds for short-term contract as needs arise.

Item 10. Other matters

No other matters were discussed.

Item 11. Adoption of Report

The Report was adopted.

Item 12. Adjournment

The meeting was adjourned.

Table 1. Progress in the collection of 1982 Task I and Task II data (as of November 8, 1983)

Species, Gear and Country	TASK I				TASK II CATCH & EFFORT									BIOLOGICAL (SIZE)						Remarks
	Date Rec'd		Effort	By big areas	Date Rec'd		Area	Time	Cov. rate %	Data cov.*	Effort	Weight	No. of fish	Date Rec'd		Area	Time	Data cov.*	No. of fish sampled/ total catch (MT)	
	1982	1983			1982	1983								1982	1983					
YFT, BET, SKJ Surface Fleet																				
BB																				
Angola	Jul 27	Apr 15**	X	X	Aug 20	Aug 23	5x5	mo	100	U	X	X		Aug 13	Aug 23	local	mo	U	2409/3617	
Brazil	May 7	May 30**	X	X	Sep 1	Mar 14	1x1	mo	39	U	X	X		Sep 1	Mar 14	1x1	mo	U	13946/16013	2 sets of effort for same C/E data; only SKJ size data.
Brazil-based, G.Cayman leased		May 30**	X	X																
Brazil-based Spain leased	Aug 31																			No fishery operated.
Brazil-based Japan leased		May 30**	X	X																
Cape Verde	May 31	Apr 28	X	X	May 31	Apr 28	5x5, ICCAT	mo	100	U	X	X		Jul 26, Sep 7	Apr 28	5x5	mo	U	1474/2489	
Cuba	Oct 13	May 19	X	X										Apr 5	Apr 20	ICCAT	qtr	U,R	5704/1134	Size for SKJ (4474 BLF measured).
FIS	Apr 27	Apr 15**		X	May 15									Jul 12						
Ghana	Aug 16				Apr, Jun									Apr, Jun						
Ghana-based (Japan-ICCAT, Korea+Panama)	Aug 16				Apr, Jun									Apr, Jun						
Japan	Jul 22	Oct 11		X	Aug 31	Oct 11	1x1	mo	90	?	X	X			Jun	5x5, 5x10	mo	U	3945/15683	Task I and C/E includes revised 1981 data; size for 1981 only.

Table 1. cont.

Species, Gear and Country	TASK I				TASK II CATCH & EFFORT									BIOLOGICAL (SIZE)						Remarks
	Date Rec'd		Effort	By big areas	Date Rec'd		Area	Time	Cov. rate %	Data cov.*	Effort	Weight	No. of fish	Date Rec'd		Area	Time	Data cov.*	No. of fish sampled/ total catch (MT)	
	1982	1983			1982	1983								1982	1983					
Korea	Oct 27	Aug 24	X	X	Aug 30	Aug 24	1x1	mo	62.1	U	X	X		Aug 30	Aug 24	1x1	mo	U	515/3408	
Panama																				
Portugal (Madeira)	Feb 1	Jan 25	X	X	Feb 1	Jan 25	1x1	mo	100	U	X	X								C/E previously reported as SURF including BB.
		Aug 24	X	X		Aug 24	5x5	mo	100	U	X	X								Data for Jan-Mar, 1983.
(Azores)	Sep 13	Aug 2	X	X	Sep 13	Aug 2	5x5	mo	100	U	X	X		Oct 8					0/5770	
South Africa	Mar 1	Apr 6	X	X	Mar 1	Apr 6	1x1	mo	100	U	X	X			Apr 6	1x1	mo	U	24/24	Size for SKJ.
Spain (Can.Is. and Peninsula)	Jul 7	Jun 14	X	X	Oct 20									Apr 22, Nov 8						
U.S.S.R.														Aug 16						No fishery operated.
Venezuela		Jun 30	X	X		Jun 30	10x10	mo	100	U	X	X								
						Jul 19	1x1	qtr	?	U	X		X							C/E for 1981.
															Jul 19	1x1	mo	U	100/?	SKJ size for 1983.
PS																				
Brazil-based G.Cayman leased		May 30**	X	X																
Canada	Jul 28													Jul 29						No fishery operated.
Congo	Apr 27																			Fishery ended 1981.
Cuba	Oct 13	May 19	X	X															0/298	
FISM	Apr 27	Apr 15**	X	X	May 15									Jul 12						
Ghana	Aug 16				Apr, Jun.									Apr, Jun						

Grand Cayman	Apr 27	Jul 26		X															Reported by Ivory Coast.
Morocco		Apr	X	X															
Portugal	Jul 22	Jul 28	X	X															
South Africa	Mar 1	Apr 6	X	X	Mar 1	Apr 6	1x1	mo	100	U	X	X							
Spain	Jul 7	Jun 14	X	X	Jul 15	Jul	1x1	mo	78	U	X	X	Sep 29	Aug	5x5, ICCAT	mo	U,R	?	Size: SKJ, YFT raised; BET actual.
U.S.A.	Jul 5	Jul 8	X	X	Jul 5								Jul 5	Jul 8, Aug 5	general	mo, qtr	U,R	100/1148	
U.S.S.R.	Aug 9	May16	X	X	Aug 9	Jul 1	FAO/ 5x5	mo	100	U	X	X	Aug16	Aug 3	ICCAT	mo	U	1947/2392	
Venezuela		Jun 30	X	X		Jun 30	10x10	mo	100	U	X	X		Jul 8	Carib-bean	qtr	U	1094/21563	Size reported by U.S.A.
														Jul 19		mo	U	100/?	SKJ size for 1983.
Uncl & Others																			
Angola	Jul 27	Apr 15**		X															
Argentina		May24		X															
Barbados		Mar 17**		X															
Benin		Jun		X															Data for 1981-82.
Brazil	May 7	May30**		X															
Cape Verde	May31				May31														No fishery operated.
Ghana	Aug16																		
South Africa	Mar 1	Apr 6	X	X	Mar 1	Apr 6	1x1	mo	80	U	X	X							
Spain		Jun 14	X	X															
U.S.A.	Jul 5	Jul 8		X															
U.S.S.R.	Aug 9	May16		X	Aug 9	Jul 1	FAO/ 5x5	mo	100	U		X							
Venezuela																			
Albacore Surface Fleet																			
BB																			
Brazil		May30**	X	X		Mar 14	1x1	mo	39	U	X	X							2 sets of effort for same C/E data.
France	Mar 22	May 2	X	X															

Table 1. cont.

Species, Gear and Country	TASK I				TASK II CATCH & EFFORT									BIOLOGICAL (SIZE)						Remarks
	Date Rec'd		Effort	By big areas	Date Rec'd		Area	Time	Cov. rate %	Data cov.*	Effort	Weight	No. of fish	Date Rec'd		Area	Time	Data cov.*	No. of fish sampled/ total catch (MT)	
	1982	1983			1982	1983								1982	1983					
BB cont.																				
Portugal																				
(Azores)	Sep 13	Aug 2	X	X	Sep 13	Aug 2	5x5	mo	100	U	X	X		Oct 8					0/188	
(Madeira)	Feb 1	Jan 25	X	X	Feb 1	Jan 25	1x1	mo	100	U	X	X								Previously reported as SURF.
		Aug24	X	X		Aug24	5x5	mo	100	U	X	X								Data for Jan-Mar, 1983.
South Africa	Mar 1	Apr 6	X	X	Mar 1	Apr 6	1x1	mo	100	U	X	X			Apr 6	1x1	mo	U,R	200/2021	
Spain (Can.Is.)	Jul 7	Jun 14	X	X	Oct 20									Apr 22, Nov 8						
(Biscay)	Jul 7	Jun 14	X	X		Sep 27	Biscay, Medi	mo	100	U	X	X		Oct 15	Sep 27	Biscay	mo	U	6044/15362	
Venezuela		Jun 30	X	X		Jun 30	10x10	mo	100	U	X	X								
TROL																				
France	Mar 22	May 2	X	X																
Spain (Biscay)	Jul 7	Jun 14	X	X		Sep 27	Biscay, Medi	mo	100	U	X	X		Oct 15	Sep 27	Biscay	mo	U	16293/10169	
Uncl & Others																				
Argentina		May24		X																
Brazil	May 7	May30**		X																
FISM	Apr 27	Apr 15**	X	X																
Italy	Apr 13	May		X																Estimate.

Uncl & Others cont.																			
South Africa	Mar 1	Apr 6	X	X	Mar 1	Apr 6	1x1	mo	80, 100	U	X	X							
Spain (trop.)	Jul 7	Jun 14	X	X															
U.S.A.	Jul 5	Jul 8	X	X	Jul 5								Jul 5	Jul 8, Aug 5	general	mo, qtr	U,R	50/106	
U.S.S.R.	Aug 9				Aug 9														Nil 1982 catch reported.
Bluefin Surface Fleet																			
BB																			
France (Biscay)	Mar 22	Sep 2		X										Jan 19	Biscay	yr	R	?	1980-81 size data reported by Spain.
Portugal (Azores)		Aug 2	X	X		Aug 2	5x5	mo	100	U	X	X	Oct 8	Jun 22	ICCAT	yr	R	?/30 or 6	
Spain (Can.Is.)	Jul 7	Jun 14	X	X	Oct 20								Apr 22, Nov 8						
(Biscay)	Jul 7	Jun 14	X	X									Oct 13	Jan 19	Biscay	yr	R	?	1980-81 size data.
PS																			
Canada	Jul 29												Jul 29						No fishery operated.
France (Med)	Aug 17	Jul 29**	X	X										Jun 6	ICCAT	yr	R	?	1981 size data.
Italy	Apr 13	May	X	X										May	ICCAT	yr	U	3189/2182	PSFB only.
Morocco		Apr	X	X															
Norway	May 13	May 18**		X	May 13								May 13						
Spain		Jun 14		X															
U.S.A.	Jul 5	Aug 5	X	X	Jul 5								Jul 5	Aug 5	general	mo	U	?	Size: B.W.(kgs)
Yugoslavia																			
TRAP																			
Canada	Jul 29	Aug 3		X									Jul 29						
Italy	Apr 13	May	X	X															
Libya																			
Spain	Jul 7	Jun 14		X										Jun	5x10	yr	R	?	
Tunisia		Apr 28		X															1980-82 data (source:Secretariat)

Table 1. cont.

Species, Gear and Country	TASK I				TASK II CATCH & EFFORT									BIOLOGICAL (SIZE)							Remarks
	Date Rec'd		Effort	By big areas	Date Rec'd		Area	Time	Cov. rate %	Data cov.*	Effort	Weight	No. of fish	Date Rec'd		Area	Time	Data cov.*	No. of fish sampled/ total catch (MT)		
	1982	1983			1982	1983								1982	1983						
Uncl & Others																					
Canada	Jul 29	Aug 3		X	Jul 29									Jul 29							
France (Med)	Aug 17	Jul 29**		X																	
Greece	Mar 22																				
Italy	Apr 13	May		X																	
Norway	May 13				May 13																No fishery operated.
Portugal (Madeira)	Feb 1	Jun 6		X	Feb 1	Jan 25	1x1	mo	100	U	X	X			Jun 6	ICCAT	yr	U	1/.6		1979-82 size data.
		Aug 24		X		Aug 24	5x5	mo	100	U	X	X									Data for Jan-Mar, 1983.
Spain	Jul 7	Jun 14		X																	
Turkey	Aug 18																				
U.S.A.	Jul 5, 13	Aug 5		X	Jul 5									Jul 5	Aug 5	general	mo	U	?		By gears incl. LL.
Billfishes (including SWO) Surface Fleet																					
Argentina		May 24		X																	
Barbados		Mar 17**		X																	
Benin		Jun		X																	1981-82 data.
Brazil	May 7	May 30**		X																	
Canada	Jul 29																				No fishery operated.
FISM	Apr 27	Apr 15**	X	X																	
Ghana	Aug 16																				
Greece	Mar 22																				
Italy	Apr 13	May		X																	Estimate.

Portugal (Madeira)	Feb 1	Jan 25	X	X	Feb 1	Jan 25	1x1	mo	100	U	X	X							
		Aug 24	X	X		Aug 24	5x5	mo	100	U	X	X							Data for Jan-Mar, 1983.
(Tropical)	Jul 22																		Nil catch reported.
(Azores)	Sep 13	Aug 2		X	Sep 13	Aug 2	5x5	mo	100	U		X							
Senegal	Jun 30	May 18	X	X															
South Africa	Mar 1	Apr 6		X	Mar 1	Apr 6	5x10	mo	100	U		X							
Turkey	Aug 18																		
U.S.A.		Jul 8		X									Oct 29						Task I: SWO only.
U.S.S.R.	Aug 9				Aug 9														Nil catch reported.
Small Tunas Surface Fleet																			
Angola	Jul 27	Apr 15**	X	X	Aug 20	Aug 23	5x5	mo	100	U	X	X	Aug 13	Aug 23	local	mo	U	2646/1548	
Argentina		May 24		X															
Barbados		Mar 17**		X															
Benin		June		X															1981-82 data.
Brazil	May 7	May 30**	X	X	Sep 1	Mar 14	1x1	mo	39	U	X	X							2 sets of effort for same C/E data.
Cape Verde	May 31	Apr 28	X	X	May 31	Apr 28	5x5, ICCAT	mo	100	U	X	X							
Cuba	Oct 13	May 19	X	X															
FISM	Apr 27	Apr 15**	X	X															
Ghana	Aug 16																		
Greece	Mar 22																		
Morocco		Apr		X															
Portugal (Azores)	Sep 13	Aug 2		X	Sep 13	Aug 2	5x5	mo	100	U		X	Oct 8						
(Madeira)	Feb 1	Jan 25	X	X	Feb 1	Jan 25	1x1	mo	100	U	X	X							
		Aug 24	X	X		Aug 24	5x5	mo	100	U	X	X							Data for Jan-Mar, 1983.
Sao Tomé		Apr 20		X															
Senegal	Jun 30	May 18		X	Jun 30	May 18	1x1, ICCAT	mo	99.29	U		X							
South Africa	Mar 1				Mar 1														Nil catch reported.
Spain	Jul 7	Jun 14		X															
Turkey	Aug 18																		
U.S.A.	Jul 5	Jul 8		X									Jul 5						
U.S.S.R.	Aug 9	May 16	X	X	Aug 9	Jul 1	FAO/ 5x5	mo	100	U	X	X							

Table 1. cont.

Species, Gear and Country	TASK I				TASK II CATCH & EFFORT									BIOLOGICAL (SIZE)							Remarks
	Date Rec'd		Effort	By big areas	Date Rec'd		Area	Time	Cov. rate %	Data cov.*	Effort	Weight	No. of fish	Date Rec'd		Area	Time	Data cov.*	No. of fish sampled/ total catch (MT)		
	1982	1983			1982	1983								1982	1983						
Longline Fleet (All species)																					
Brazil	May 7	May30**	X	X	Sep 1																
Brazil-based Japan leased	May 7	May30**	X	X	Sep 1									Sep 1							Reported by Brazil.
Canada	Jul 29	Aug 3		X																	
Cape Verde		Apr 28	X	X		Apr 28	5x5	mo	100	U	X	X									
China(Taiwan)	Jun 4	May23	X		Sep 29	Sep 23	5x5	mo	var.	U,R	X	X	X	Dec 14		ICCAT	qtr	U,R	60393/28352		1981 size data.
	Jul 16	Oct 4		X																	Revised with area breakdown.
															Oct 30	ICCAT	qtr	U,R	139439/37080		1982 size data.
					ICCAT		5x5	mo	?	U	X	X		ICCAT		5x5	mo	U	12882/28352		ICCAT port sampling; C/E conv. rd. wgt.
Cuba	Oct 13	May19	X	X	Nov		5x5	mo	100	U	X		X						0/6029		1981 C/E data.
Japan	Jul 22				May18	Aug	5x5	mo	100	R	X		X	Jul 21	Jun	5x10, 10x20	mo	U	52485/36797		C/E for 1981; size for 1981 w/supplemental 1980 data.
Korea	Oct 27	Aug24	X	X	Aug30	Aug24	5x5	mo	56	U	X	X		Aug30	Aug24	5x5	qtr	U	6554/19060		
Korea+Panama					ICCAT		5x5	mo	?	U	X	X		ICCAT		5x5	mo	U	5410/19060		ICCAT port sampling; C/E conv. rd. wgt.
Morocco		Apr		X																	
Panama	(Secretariat)				See Korea+Panama									See Korea+Panama							TASKI per port sampling.
South Africa	Mar 1	Apr 6	X	X	Mar 1	Apr 6	5x5	mo	100	U	X	X									
Spain	Jul 7	Jun 14	X	X		Oct 17	ICCAT	mo, yr	100	R	X	X	X	Oct 15	Oct 17	ICCAT	mo, yr	R	9981/5453		

Uruguay	Aug 10	Nov 1	X	X	Aug 10	Nov 1	1x1	mo	100	U	X	X	X		Nov 1	1x1	qtr	U	2626/976	Size for YFT, ALB, BET only.
U.S.A.	Jul 5																			Excluding BFT.
U.S.S.R.	Aug 9	May 16	X	X	Aug 9	Jul 1	FAO/ 5x5	mo	100	U	X	X		Aug 16						
Venezuela		Jun 30	X	X		Jun 30	10x10	mo	100	U	X	X								
						Jul 19	1x1	qtr	?	U	X		X							1981 C/E data.
Various																				
Portugal (Pen.)	Feb 3	Mar 8**		X																No species or gear breakdown.
Puerto Rico transshipments														Jul 5	Jul 8	general	qtr	U	?	Reported by USA.
(Reported by FAO)	Jul 26, Sep 27	Mar 15		X																Final 1981 data.

*R - Raised, U - Unraised.
**Preliminary.

Addendum 1 to Appendix 5 to Annex 10

Agenda for the Sub-Committee on Statistics

1. Opening of the meeting
2. Adoption of Agenda and arrangements for the meeting
3. Examination of progress made by national offices
4. Examination of the problems of the quality of statistics and promptness of reporting
5. Examination of progress made by the Secretariat
   - 5.1 Reporting unconventional fleet statistics
   - 5.2 Biostatistical assignments
   - 5.3 Data base
   - 5.4 Publications and dissemination of data
   - 5.5 Other matters
6. Data preparation for juvenile tropical tuna work
   - a) Updating of catch-by-size tables
   - b) Single set data
7. Review of the processing of bluefin catch-by-size tables
8. Evaluation of the need for a micro-computer
9. Future plans to improve statistics, and recommendations to the SCRS
10. Other matters
11. Adoption of Report
12. Adjournment

Addendum 2 to Appendix 5 to Annex 10

Working Group to Identify Biostatistical Assignments

The problems that originally required the creation of a biostatistical position within the ICCAT Secretariat are outlined in 1975 Report of the Sub-Committee on Statistics as: "...whether the right type of data are currently being collected; whether current data will be adequate in the future; the cost, benefit and effectiveness of current and future sampling schemes; contingency plans to deal with changing fleet composition; fishing areas and species exploited; and other such problems."

The Working Group noted that significant progress has been made in some of these fields while others by their very nature (on-going studies) still require work. The Working Group attempted to identify the tasks of a biostatistical nature relevant to the Secretariat's mandate. Some of them are outlined below:

1) Quality control and data management: insuring that the data submitted to the Secretariat are thoroughly edited so that errors they may contain are corrected (this should include revisions to previously published data as well), that the data are diligently combined in common data bases and that the data bases are in a format rendering their analysis easy.

2) Study sampling procedures and variances associated with different levels of sampling by fleet and species. This could result in revision or establishment of sampling guidelines regarding the level of sampling and sample size.

3) Evaluate the adequacy of sampling by fleet and species. The logical result is to give advice to nationals on ways to meet the requirements. This could include training.

4) Monitor and organize sampling of fisheries not covered by conventional research programs.

The Working Group noted that the data and analysis requirements of the scientists are ever increasing and as a consequence the biostatistical demands have also increased and are likely to continue increasing. It is in the mandate of the Secretariat to meet these requirements and its work can only be made easier if it includes a biostatistician amongst its staff. Some of the tasks require stability and continuity while others could be performed by short-term contract. The Working Group believes that the Secretariat requires, on a permanent basis, at least one person-year for a biostatistical position plus funds for short-term contracts as need arises.

Appendix 6 to Annex 10

REPORT OF THE WORKING GROUP ON SCRS ORGANIZATION

The Working Group on SCRS Organization met close to the end of the 1983 SCRS Meeting to review and discuss the best means to facilitate the SCRS in the production and delivery of advice to the Commission.

The Group noted that ultimately the SCRS should consider the possibility of working meetings like the IWC or ICES. At these type meetings, usually scheduled some time before the Commission meetings, scientists carry out assessments on-the-spot using data and programs available to them. This format affords all scientists the opportunity to fully understand and work through each assessment.

As a stop toward this, the Group suggested a change in format for the 1984 meeting for one species, bluefin tuna, on a trial basis, since it was recognized that that species is particularly appropriate for in-depth study.

To allow adequate time for each scientist to understand and evaluate all analyses, the Group suggests that all bluefin stock assessment documents be delivered to the ICCAT Secretariat by a September 1 deadline. These documents will then be copied and distributed by mid-September to identified national scientists and to others who request copies. All other documents will follow the previous document policy.

The SCRS Meeting should formally begin 15 days prior to the Commission Meeting. Following an initial, short opening session, the SCRS should recess and allow the bluefin discussion group to discuss papers and assessments. The following Monday all other species groups will meet as in 1983. At the SCRS Chairman's option, the SCRS can re-convene on Monday and ask the bluefin rapporteur to present a draft of Report B to evaluate progress.

Report B for all other species will be due on Wednesday before the Commission Meeting as in 1983.

As implied above the format for Reports A and B will be continued in 1984. However, the Group felt that a section dealing explicitly with assumptions in major assessments should be added to the A Reports. This should facilitate the discussion and understanding of the assessments. Operational details of the meetings are again left to the SCRS Officers.

Appendix 7 to Annex 10

REPORT OF THE BLUEFIN WORKSHOP*

Tsukuba/Shimizu, Japan, August 31-September 8, 1983

1. Opening of the Meeting

The Bluefin Workshop was held by the invitation of Japan on August 31-September 2 at the Tsukuba Office of the Research Council Secretariat of the Ministry of Agriculture and Forestry, Tsukuba; and on September 5-8 at the Far Seas Fisheries Research Laboratory (FSFRL), Shimizu.

Dr. S. Morita, Director of the Pelagic Resources Division of the Far Seas Fisheries Research Laboratory, welcomed all the participants in his opening address. Dr. I. Ikeda, Director of the FSFRL addressed the participants on the first day of the Shimizu session, emphasizing the significance of this meeting.

2. Arrangements for the meeting

Mr. M. Parrack (U.S.A.) served as the Convener at the meeting in Tsukuba and Mr. Z. Suzuki (Japan) served as the Convener at the Shimizu meeting. Dr. P. M. Miyake (Secretariat) and M. Parrack (U.S.A.) served as rapporteurs. The list of participants is attached as Appendix 2.

3. Adoption of Agenda

The tentative agenda circulated earlier by the Secretariat was adopted with slight changes. Agenda items 1-4 were taken up at the Tsukuba meeting and items 5-9 were the subject of discussion at the Shimizu meeting.

4. Review of catch-by-size data

4.1 Methodology of transformation of samples to catch

The report of the Preparatory Meeting held in Trapani, Italy, in May, 1983, was reviewed by the Workshop. The methodology used to transform samples to catch was described in the report and the Appendix prepared by the Secretariat. They were reviewed and agreed upon at the Workshop.

*Since the Bluefin Report is published in its entirety in the "Collective Volume of Scientific Papers, Vol. XIX", only the text of the Report has been included here.

The Trapani Report was slightly modified in order to reflect suggestions made by Workshop participants. The text of the Report and the Appendix are attached as Appendix 3. Tables A-B* of the Appendix to the Trapani Report were critically reviewed by the Workshop. Thus many changes were introduced.

4.2 Identification of matching size samples to catches

4.3 Review of the data substitutions used

Table A in the Appendix to the Trapani Report was studied for data matching and substitutions. The group reviewed critically problem 2 on page 3 of the Report. Noting that discrepancies can be expected between officially reported catch (in weight, Task I) and weight estimated by multiplying reported numbers of fish by average weight derived from size frequencies, the group indicated that there could be three major sources of errors: Task I weight is inaccurate (in the case of Japan's longline data from earlier years, gilled and gutted weight seems to have been reported); size frequencies are not representative (due to either biased sample or improper data substitution); or different length-weight relationships used.

The Japanese longline data for some years show very substantial differences between the two sets of weight estimates. Thus the group concluded that the substitutions adopted for the catch in 1960-63 at the time of the Trapani meeting were not optimum and decided to change the data substitutions. The new substitutions produce less discrepancies between reported and estimated catch weight.

Other changes were introduced in Table A and new information was added. The group noted that the U.S. catch-by-size tables do not match the Task I catches and decided to show catches presented at this time in Table A rather than Task I statistics.

The group noted that in Tables A and B when catches are shown only in weight, the catch weight is transformed into catch at length. However, when catches are listed in weight and number, the numbers caught are transformed to number of fish caught at length, and the catch in weight was not used to derive the catch at length.

4.4 Seasonality of catch data

To transform the catch-by-size data to catch-by-age (or cohorts), it is essential to know the time of year of catch. Since the catch tables (Table B) prepared at the Trapani meeting are on an annual basis, it will be necessary to remake the whole data base. Here, two problems exist. First, in many instances the month of catch is unknown or must be obtained from a literature search. Second, the time required to restructure the data base does not allow the work to be completed before this year's ICCAT SCRS Meeting. In order to deal with these problems, the group decided as follows:

*Table A – Bluefin catch, size data and substitutions of size data as agreed upon by east and west Atlantic and Mediterranean.

Table B – Annual bluefin catch-by-size by fishery and by east and west Atlantic and Mediterranean, 1960-1981.

For *coastal fisheries*, it identified the fishing season and assigned the annual catch-by-size to that particular quarter; for *longline fisheries*, it used the Japanese longline data to establish the quarter distribution of catch.

Keeping this in mind, the Workshop reviewed each fishery and added information and/ or instructions about seasonality (as shown in Table A).

The major problems found are as follows:

a) Japanese longline catches for 1960-1970

Estimates of quarterly length-specific catches for 1971-1981 were available. However, catches for 1960-1970 were not divided by quarter. For these catches, the group chose to allocate the catch-at-length to quarters according to the proportional catch distributions (in number of fish) reported in Task II catch data.

b) Fisheries where the quarter of catch is not known

Unsampled catches have been sized by sample substitution and often the months when the catches were actually made are unknown or different from the season from which the matched size data are taken. In general, the quarter that size samples were taken was used to assign the catch. However, when the sampling time was widespread and/or unknown, the quarters when the catches were made were assigned. All the quarters assigned to each fishery are added to Table A and a Revised Table A is appended to this Report.

c) Catch-by-size table in finer level of time resolution

It was recognized that for some fisheries, catches and size samples are available by month or quarter. The group recommended that the catch-by-size table should be reconstructed by next year using this information.

For those fisheries for which no adequate seasonal catch and size data are available, the quarterly catch-by-size table agreed upon at this time should be maintained after verification.

4.5 Examination of catch-by-size table presented

The above discussion resulted in modification of Tables B and C. There was not enough time to subdivide by season the longline catches of Japan and other countries. Therefore, only hard copies which can be used for the work were distributed to the participants.

4.6 Examination of limitations of catch-at-length tables

The Working Group recognized three general problems: unsampled catches, poorly sampled catches, and unreported catch. It examined the large numbers of substitutions necessary to generate the catch-at-length tables, noting that the occurrence of such substitutions is very high. Mr. T. Nagai of the FSFRL submitted a preliminary study of those tables noting that a large number of substitutions was employed for the west Atlantic previous to 1969. The Working Group acknowledged that although there is a gradual in-

crease in the number of size frequency samples through time, east Atlantic and Mediterranean Sea catches were, for the most part, unsampled; hence the number of substitutions used is extensive.

It was also noted by Mr. Nagai and discussed by the Workshop that the numbers of fish sampled have been low in many cases and unrecorded in others. In a large number of cases where samples were taken and the sample size recorded, the sample size was insufficient to obtain a 20 percent precision level. The group also noted that frequently the month the sample was taken was not recorded, that the kind of size measure made is often not reported, and that the number of fish sampled is also not reported. In considering these deficiencies, the Working Group became concerned that, although nothing can be done about such deficiencies in the past, they should not continue. In that regard the group recommends that SCRS consider this problem this year and adopt a set of standards for bluefin size frequency sampling and structure a mechanism to police the reporting of such samples.

As referenced in the Report of the Trapani Meeting, the Working Group also noted the absence of reports of catches of age 0 fish in Mediterranean Sea fisheries. The Working Group recognized this problem as an important one requiring action. The Working Group also noted inadequacies in catch statistics in specific Mediterranean Sea fisheries as described in the Trapani Report and urges the SCRS to consider contracting an agency to improve all data from these fisheries, including catches of age 0 fish and size frequency samples.

4.7 Transformation of catch-at-length to catch-at-age

The Workshop considered three types of problems that may be encountered when converting length to age by employing growth equations. Sexual dimorphic growth, large differences in abundance between cohorts, and large differences in the growth of individuals introduce possible bias. Some indication of sexual dimorphism exists in that males tend to be larger than females as in other tunas. The Workshop intends to investigate this phenomenon further as data become available. The Workshop members discussed the possibility of stochastic growth and concluded that aging algorithms used in future analyses should account for differences in growth between individuals. Finally, the effect of large differences in cohort strength on age estimates was discussed. It was concluded that such differences could produce estimation bias and hence such bias should be explored for those age estimation procedures used in future analyses.

5. Consideration of alternative assessment techniques applicable to bluefin tuna and alternative use of data (e.g., catch at length)

The use of CPUE-based analysis of surplus production was discussed by the group. A number of ideas were expressed as to why such techniques may not prove appropriate in the case of Atlantic bluefin. The group acknowledged that standardization of fishing effort is the largest problem because of the large number of distinct fisheries which cannot be standardized to a single measure. The group recognized that since these many fisheries are very distinct in time and space and because the different gears used are precisely adapted to

the behavior of the age-specific groups of fish, an overall accurate CPUE index of abundance cannot be obtained. It was recognized that due to the long life of Atlantic bluefin, the very large increase in weight through the life span and the existence of large fluctuations in year-class abundance, such methods are not likely to be appropriate. The general idea, however, to gain insight as to population history was considered useful.

The use of the CPUE to index abundance was considered to be a useful tool for estimating year classes and spawning population. In this regard, a table is attached listing CPUE data availability and characteristics of major Atlantic bluefin fisheries.

The group considered several other alternative assessment techniques. These include:

a) Hydro-acoustic surveys to establish an index of spawning population size.

b) Consideration of egg and larval surveys to estimate spawning stock size.

c) Aerial over-flight data to index recruitment strength.

d) Mark-recapture data to estimate population size.

e) Sequential population analyses (e.g., VPA, cohort analyses).

f) Analysis of catch-at-length other than VPA.

g) Establishment of the relationship between recruitment abundance and environmental conditions during early life.

6. Application of VPA to the bluefin tuna data base

Following a suggestion by the SCRS, the Japanese Government invited Dr. W. G. Doubleday (Canada), a scientist well experienced in VPA application in fields other than tuna. He addressed the application of catch-at-age-based analysis to Atlantic bluefin data. These considerations are reported in document SCRS/83/26. Particular problems included incomplete sampling, age estimation errors, unknown migration rates, changes in fishing patterns and catchability, lack of recruitment index, and inadequate analysis of the mark and recapture data.

The group considered these items paramount and also was concerned with methods of tuning or calibrating such analyses. In this regard, an analysis of catch and effort data was considered important, particularly analyzing such data on the smallest spatial and temporal resolution possible. Monthly 1^{o}x1^{o} area Japanese longline data should be isolated for future analysis. Also, the group recommended that the performance of any tuning or calibration method used in future analyses be documented.

After a lengthy discussion, the group recommended that the natural mortality rates from 0.1 to 0.18 be used for bluefin.

Transformation of the catch-at-size data into the age group was discussed and the group recommended that such transformations used in future analyses account for variation and growth rates between individuals. Furthermore, examination of U.S. and Canadian size data by sex shows differences in length-specific sex ratio. Such data should be employed in future analyses to establish sex ratio in the catch and to derive parameters for sex-specific growth models. Although sex-specific mortality rates may offset any differences in growth rates, the group concluded that such phenomena should be investigated.

The underestimation of longline catches resulting from not recording of mutilated fish was discussed and it was decided that mutilation rates must be estimated if available data permits and the longline catch data must be adjusted.

The group considered the very large number of age-classes included in past analyses and difficulties experienced in transforming the catch-at-length table to an age table. Consequently, a large year-class tends to be underestimated and a small year-class tends to be overestimated; hence, the variations in strength between cohorts are smoothed. The group concluded that these older ages in the catch tables should be combined into a single category for analysis purposes. Such treatment of older-aged fish in the analyses and the use of stochastic ageing methods likely preclude possibly skewed catch tables. If future catch tables contain truncated catches from specific cohorts, it was agreed that analysis procedures will not assume that the cohort did not live beyond the last year of catch. Here the use of $Z = M$ will be used to project the population forward.

The group recognized the importance of establishing mixing rates between east and west populations and concluded that X-ray analysis of micro-elements in the hard parts laid down at different stages of the life span would allow estimates of the frequency and periodicity of transatlantic migration. The feasibility and cost of such analyses need to be determined. The group also considered that the studies of distributions of bluefin parasites and those of parasites themselves may be useful in investigating the mixing rate of tuna.

Recognizing all these difficulties, the group found that there is no other analysis which would be more effective in population analyses for the Atlantic bluefin tuna than VPA and improvements as discussed should be promptly introduced.

7. Future work schedule

Projects requiring future action are as follows:

a) Assemble a data file on west Atlantic mark-recapture data and forward it to the ICCAT Secretariat. The U.S.A. is responsible for forwarding this file by April 1, 1984.

b) Analyze all mark-recaptures by October 1, 1984. Spain, Japan and the U.S.A. are responsible for such investigations.

c) Analyze U.S.A. rod-and-reel CPUE for recruitment index. A preliminary analysis will be carried out by the U.S.A. by November, 1983.

d) Analyze 1°-square longline CPUE. This analysis will be carried out on a high priority basis jointly by interested countries as soon as the data are available. Japan is responsible for making the data available by April 1, 1984.

e) It was recognized that reported longline catches are biased low because fish mutilated by sharks and marine mammals are not included in reported statistics. These amounts should be estimated and reported to the SCRS by November, 1984. The U.S.A. is responsible for this report.

f) Refine the time resolution of the catch-at-length data. All countries are responsible for submitting to ICCAT such catch-at-length data by the finest resolution

available (not less than one month) by March, 1984. The ICCAT Secretariat shall, in collaboration with other national scientists as required, derive such data that remains unreported.

g) Noting the deficiencies in catch and size frequency data described in paragraph 4.7 and realizing these deficiencies should not continue, the SCRS should adopt this year a set of standards and structure a mechanism to insure that such standards are maintained.

h) The Workshop recognized the need to establish the frequency and periodicity of transatlantic migrations. Here, the X-ray analysis of micro-elements in hard parts was viewed as a likely method. The U.S.A. is responsible for determining the cost of analysis of a small number of fish by the November, 1984, SCRS Meeting.

i) Investigate the use of over-flight data to index recruitment abundance. It was determined that all countries should obtain verbal reports from "spotter pilots" and discuss the feasibility of the method at the November, 1983, SCRS Meeting.

j) Analyze egg and larvae research cruise survey data to index spawning stock abundance. It was pointed out that the U.S.A. was collecting such data on an on-going basis and that the time series was not yet sufficient. Spain will investigate data from the Mediterranean Sea.

k) Appraise the use of hydro-acoustic data to index spawning populations. Through correspondence, the U.S.A., Canada, and perhaps Japan will collaborate to submit a report at the November, 1984, SCRS Meeting.

l) In response to the need to compile dependable statistics for the Mediterranean Sea fisheries, it is recommended that the work be contracted to an outside agency. It is the responsibility of the ICCAT Secretariat to study the feasibility of contracting such work and report its findings at the November, 1983, SCRS Meeting.

m) Isolate sex ratio at length data. Spain, Canada, Japan and the U.S.A. are responsible for submitting documents listing these basic data at the November, 1983, SCRS Meeting.

n) Use sex ratio at length data to estimate sex-specific growth parameters by simulation. France will provide the results of such simulations by April, 1984.

Considering the importance and magnitude of the above items and the time period required to achieve them, it is unlikely that stock assessments carried out before 1984 will add significantly to those that were made previously. Specifically, items a-f and m-n must be completed first.

Items that must be addressed in future assessments presented to the SCRS are as follows:

a) Techniques to estimate age from length that account for different growth rates among individuals.

b) The reliability of calibration methods should be studied via simulation, and reported. Assumptions such as zero intercept may not be forced to hold but rather be

used in the tuning process to choose between different fishing mortality vectors. Further, calibration should be based on catch and effort samples, not on the estimates of totals after prorating. Such calibration should be on the basis of a fine resolution of time and space.

c) Use a single age compartment for older fish. However, the presence of fish older than the last age employed in VPA should be used in forward projections.

d) Use VPA procedures that do not assume that the last age in the catch is the last age alive using Z = M for forward projection of a cohort.

e) The range of natural mortality from 0.10 to 0.18 seems reasonable given the current information. The use of M's outside this range should be justified by additional data.

8. Adoption of Report

The draft report was presented. After being thoroughly reviewed and modified, the report was adopted. Table A was complete at the time the meeting adjourned but Tables B and C were only partially complete. However, all meeting participants received the basic data to complete them. The Secretariat was asked to complete the tables in collaboration with the FSFRL staff for later circulation.

Recognizing that Table B will be very bulky, the Group decided that the Report should be distributed with Tables A and C, with a note explaining that Table B is available upon request at the Secretariat. At least one set of Table B should be sent, however, to each member country.

9. Adjournment

Mr. J. S. Beckett, the SCRS Chairman, thanked all participants for their excellect contributions, the FSFRL staff for their hospitality and organization of the meeting, and convenors and rapporteurs. Dr. I. Ikeda, Director of the FSFRL, made a closing address, and commented on the success of the meeting, the new findings made at this time and the difficulties still remaining for the future.

The meeting was adjourned.

TABLE OF AVAILABILITY OF CPUE DATA FOR VARIOUS FISHERIES

West Atlantic	*Gear*	*CPUE Series*	*Comments*
Canada	R & R	1975-	Areas have changed. Learning apparent. Number of boats prior to 1975.
	Keg	1982-	New fishery.
	Trap	1975-	Proportion of catches landed increased mid-70's as price increased.
	PS	1963-81	Various periods with vessel change. Aircraft.
U.S.A.	Trap	None	
	PS small	None	Appropriate measure unavailable due to unrecorded increase in aircraft spotters. Availability fluctuations seen.
	PS large	None	
	R & R small	1975-82	Large availability fluctuations.
	R & R large	1982	
	LL	None	
Japan	LL winter	1970-	Mixed fishery (BET). In some years BFT catch small.
	LL summer	1957	Incidental catches of medium and large fish.
	LL G. of Mex.	1976-81	Fishery terminated. Large fish in spawning season.
	LL Brazil	1960-68	Medium and large fish.

East Atlantic	*Gear*	*CPUE Series*	*Comments*
Norway	PS	None	
	Mixed	None	
Other North Sea		None	
France	BB	1960-	
Spain	BB (Biscay)	1972-	Effort declined recently.
	BB (Can. Is.)	1965-	Very small boats, effort very variable.
	Trap	1960-	Trap numbers declined.
Portugal	Trap	None	Fishery ceased after 1970.
	Azores	1974-	Very small boats taking various species tuna.
	Madeira	1976-	Very small boats taking various species tuna.
Morocco	PS	1961-	Days at sea for some years.
	Trap	1960-	No. of traps.
Japan	LL	1972-	

Mediterranean	*Gear*	*CPUE Series*	*Comments*
France	PS	1975-	Specialized fleet. After 1981, number of days fished; prior number of boats only.
Spain	Age 0	None	Effort reflects abundance.
	Trap	1960-78/81-	Now set sporadically for species other than BFT.
Italy	Trap	None	
	PS small	None	
	PS large	None	
Japan	LL	1972-	Main fishery closed 1975 on.
Morocco	Trap	1960-	Number of traps.
Tunisia	Trap	1960-	Trap days until 1978.
	PS	None	

CHAPTER III
National Reports

NATIONAL REPORT OF BRAZIL – 1982

by

J. HERIBERTO MENESES DE LIMA

1. Present status of the fishery

1.1 Development of the fleet

Tuna fishing in Brazil is carried out using artisanal gear in the northeast only; industrial fishing is carried out in the southeast and south and occasionally in the northeast.

During 1982 the artisanal fishery maintained the same technology and number of boats. In the industrial fishery there were changes in the number and type of boats in operation.

According to the type of fishing, the following changes occurred:

- Longliners - This fleet increased from 6 to 12 boats. By the end of the year the fleet consisted of 7 national and 5 leased vessels.
- Baitboats - More boats were adapted from other national fishing fleets and the number of boats in operation during the same periods of the year reached 100 units. The composition of the leased fleet was as follows: 1 large Japanese boat, 3 Spanish boats, and 2 medium sized vessels from the Cayman Islands.

A medium purse seiner, leased from the Cayman Islands, operated in Brazilian waters, thereby initiating this type of tuna fishing in Brazil.

Original report in English.

The average GRT of the national baitboats increased to 84.6 MT. In 1979, when bait fishing began, it was 31.7 MT. This change seems to reflect an adaptation of the fleet to prevailing conditions, which, during certain periods of the year, demands a greater displacement of the boats, requires better navegational conditions, and a larger capacity for transportation of live bait.

1.2 Fishing areas

The national longliners continue to operate alternatively in the southeast or in the south of Brazil, but always during the same periods.

The leased fleet concentrated its operations in the south, although in 1982 it sometimes operated in the northeast and southeast during the first and fourth quarters of the year.

The national baitboat fleet increased its fishing area to as far south as the Santa Catarina State, in new fishing areas discovered by the leased fleet. The baitboat leased fleet operated in the entire southeast/south region and concentrated its effort off the Santa Catarina coast.

1.3 Trends in catch and effort (Table 1)

During 1982, landings by the longline fleet (national and leased) showed an increase of 40 percent in comparison to 1981, and effort rose to around 61 percent, indicating a decrease in fishing yield.

Landings by the baitboat fleet increased but this increase was less than in previous years, which is considered normal for a developing fleet. The increase in production was due mainly to the operation of a Japanese leased boat whose catches totaled 1,760 MT, equivalent to 10 percent of the total production of the national fleet.

Fishing effort of the national baitboats increased 273 percent in comparison to 1981, with a 151 percent increase in catches, indicating that the CPUE (MT/day of effective fishing) is decreasing: 1980 (6.4); 1981 (5.2); and 1982 (4.3).

Statistical information on catch and effort of the artisanal fleet is not available; estimated landings were 2,500 MT.

2. Research program

In 1982 research on tunas in Brazil continued and in some instances shows better development than in previous years, as was the case of the Program of Biostatistical Sampling of landings of the bait fishery, which with the standardization of the samples, showed better results on the knowledge of size composition and reproduction pattern of skipjack.

Brazil's cooperation with research institutions from other countries in the Skipjack Program was more effective, and a large number of samples of biological material for age studies, reproduction and feeding habits was supplied.

Other research areas presented some results in 1982, which were submitted to the SCRS meeting.

Table 1. Total landings of tunas and tuna-like fishes in Brazil, by area and by fishing gear, 1980-82.

Yrs.	Area	Gear	Effort (No/hooks)	Total Catch	Catches by species (MT) BFT	YFT	ALB	BET	BLF	SWO	WHM	BUM	SAI	SKJ	KGM	WAH	SSM	Others
80	SE	LL	1,192,610	1,892.8	---	209.4	184.9	154.1	---	937.8	26.6	10.0	67.2	---	---	---	---	302.9
	SE[1]	LL	1,278,542	1,369.4	1.4	250.8	204.1	347.4	---	292.5	21.7	6.5	9.9	---	---	---	---	235.1
	SE	BB	1,068	6,846.0	---	479.2	---	---	68.5	---	---	---	---	6,298.3	---	---	---	---
	NE	Troll	---	3,093.4	---	95.2	86.4	109.7	180.9	3.0	2.9	7.2	86.7	263.1	846	56.2	1,356.0	---
	Total			13,201.6	1.4	1,034.6	475.4	611.2	249.4	1,233.3	51.2	23.7	163.8	6,561.4	846	56.2	1,356.0	537.9
81	SE	LL	1,223,105	996.4	---	406.6	63.1	90.6	2.2	337.9	25.5	---	38.3	---	---	---	---	32.1
	SE	LL	1,178,950	1,595.0	2.5	643.5	187.1	302.1	---	159.1	3.5	3.6	0.2	---	---	---	---	293.4
	SE	BB	---	14,797.7	---	905.5	---	---	---	---	---	---	---	13,729.6	---	---	---	162.6
	SE	BB	---	194.0	---	11.6	---	---	---	---	---	---	---	182.4	---	---	---	---
	NE	BB	---	25.1	---	25.1	---	---	---	---	---	---	---	---	---	---	---	---
	NE	Troll	---	2,588.6	---	8.0	20.0	50.0	85.0	0.5	0.1	20.0	55.0	---	827.0	62.0	1,461.0	---
	Total			20,197.0	2.5	2,000.3	270.2	442.7	87.2	497.5	29.1	23.6	93.5	13,912.0	827.0	62.0	1,461.0	488.2
82	SE	LL	1,629,735	1,268.4	---	279.8	179.2	155.6	10.5	512.0	18.8	0.6	51.0	---	---	---	---	60.9
	SE[1]	LL	2,240,916	2,351.7	2.2	515.1	537.1	410.6	---	279.1	46.7	10.1	6.6	---	---	---	---	543.9
	SE	BB	3,990.7	17,200.0	---	1,032.0	51.6	---	---	---	---	---	---	16,013.2	---	---	---	103.2
	SE[1]	BB	115.0	1,760.0	---	3.6	---	35.2	---	---	---	---	---	1,714.2	---	---	---	7.0
	SE[2]	BB	---	28.8	---	---	---	---	---	---	---	---	---	28.8	---	---	---	---
	SE[2]	PS	---	165.8	---	---	---	---	---	---	---	---	---	165.8	---	---	---	---
	NE	Troll	---	2,500.0	---	7.5	19.2	47.5	80.0	0.6	0.1	20.0	52.5	---	---	---	---	2,352.6
	Total			25,274.7	2.2	1,839.0	787.1	648.9	90.5	791.7	65.6	30.7	110.1	17,922.0	---	---	---	2,987.6

1 Japanese leased.
2 Cayman Islands leased.

Source: PDP/SUDEPE/INST. PESCA (Sao Paulo).

CANADIAN NATIONAL REPORT, 1982-1983

by

T. R. HURLBUT and J. J. MAGUIRE

1. Status of the fisheries

1.1 Swordfish

The nominal catch of swordfish in Canada in 1982 amounted to 554 MT. This represents a decrease from the 1981 catch of 561 MT and probably reflects market conditions rather than abundance of swordfish. The swordfish longline fishery accounted for 542 MT, while 12 MT were taken in the harpoon fishery. Most of this swordfish was transshipped at sea to American vessels and landed in American ports.

1.2 Tunas

Canadian bluefin tuna landings in 1982 amounted to 291 MT, a decrease of 29 MT from the 1981 level. The mackerel trap fishery in St. Margaret's Bay took only 68 MT, while 213 MT of giant bluefin were taken by handgear ("tended line" and rod and reel) and 10 MT were taken incidentally by other gear types. Substantial changes were made in the regulations for the Canadian Atlantic bluefin tuna fishery. The fishery was placed under strict sub-area allocations and the catch limit was reduced from two to one fish per vessel per day. There was no Canadian purse seine fishery for tuna in the Atlantic in 1982.

Fishing effort was reduced and "tended line" gear was more common than rod and reel gear. Average weight decreased in the Gulf of St. Lawrence fishery in 1982.

2. Research studies

2.1 Swordfish

The age validation study was continued comparing ages determined from otoliths, anal fin spines and caudal vertebrae. No swordfish were tagged or recaptured in 1982.

Original report in English.

2.2 Tunas

Individual weights were obtained from approximately 74 percent of the giant bluefin caught in Canadian waters. Logbook coverage improved in 1982; however, no analysis of 1982 effort data has been attempted to date.

Intensive biological sampling was conducted on Prince Edward Island and at St. Margaret's Bay, Nova Scotia. Otoliths were collected from 180 of the giant bluefin landed on Prince Edward Island, as well as from most of the fish harvested in St. Margaret's Bay, Nova Scotia.

There were no tuna tagged or recaptured in 1982.

3. Preliminary information for 1983

Canadian swordfish regulations have changed very little since 1982. Participation in the fishery was poor this year chiefly due to market problems. As a result, the total catch is not expected to exceed 500 MT this year.

No swordfish were tagged or recaptured this year.

The Canadian quota for bluefin tuna was increased from 250 to 573 MT. There were no new licenses issued and the Canadian fisheries were managed by sub-area quota. The "tended line" gear was more prevalent than rod and reel gear.

The quotas for Quebec and New Brunswick were not met. Fisheries for bluefin are still in progress in Prince Edward Island and Nova Scotia (St. George's Bay). The trap fishery in St. Margaret's Bay was almost a complete failure.

There was no Canadian purse seine fishery for tuna in 1983. As well there were no tuna tagged or recaptured in Canadian waters this year.

4. Documents presented to the 1983 SCRS Meeting

Two documents were presented to the 1983 SCRS (see Appendix 2 to Annex 10). These are included in the Collective Volume of Scientific Papers, Vol. XX.

SUMMARY OF THE STATE OF THE TUNA FISHERIES – REPUBLIC OF CAPE VERDE

by

H. SANTA RITA VIEIRA

1. Fishing areas

Cape Verde fishing operations generally take place in Cape Verde waters. An experimental fishery is conducted at Sao Tomé and another in the Azores. A freezer baitboat, with crew, was rented in Mozambique for experimental fishing in that area.

2. The fleet

The fleet which operated in 1983 (up to the end of September) was comprised of three freezer baitboats and 18 baitboats without freezer facilities.

About 40 boats carry out line fishing to supply a small canning factory.

Through an agreement with the Government of Spain, seven Spanish baitboats fished in the Cape Verde Exclusive Economic Zone (EEZ).

In order to try out fishing gears other than baitboat or line fishing, a Portuguese purse seiner was authorized to carry out experimental fishing.

3. The catches

The total catches , broken down by fishing areas, are shown in Table 1.

4. Statistics

As regards statistics, Cape Verde has tried to follow the ICCAT recommendations by collecting catch, effort and size sampling data by 5x5 degree squares.

Original report in French.

Table 1. Catch (MT) and effort data for 1983 (up to the end of September)

Catch	*T. alabacares*	*K. pelamis*	*T. obesus*	*A. solandri*	*A. thazard E. alletteratus*	*T. alalunga*	*I. thynnus*	*Gear*	*Effort*	*Area*
181	97	45	33	6	---	---	---	Hand	1500	Cape Verde
130	8	122	---	---	---	---	---	FBB	20	Cape Verde
4.5	4	0.5	---	---	---	---	---	FBB	30	Sao Tomé
166	1	1	144	---	---	10	10	FBB	85	Azores
884	446	351	68	17	2	---	---	BB	867	Cape Verde
1365.5	556	519.5	245	23	2	10	10			

NATIONAL REPORT ON CUBAN TUNA FISHERIES IN 1982 AND RESEARCH ACTIVITIES CARRIED OUT IN 1982 AND 1983

by

B. GARCIA MORENO and A. RODRIGUEZ RODRIGUEZ

1. The fisheries

1.1 Fishing areas

As in previous years, Cuban vessels which caught tunas and tuna-like species in the Atlantic operated in two areas, according to their load capacity and area of operation (Fig. 1).Small and medium range vessels operated in adjacent Cuban waters, using troll, longline and baitboat. On the other hand, long-range vessels operated in the central Atlantic using purse seine and drift longline gear.

In 1982, the area of operation of the long-range vessels was limited to the South by the Equator, to the North by 15ºN and to West by 55ºW.

1.2 The tuna fleet

The total number of vessels which operated for tunas and tuna-like species in 1982 was approximately the same as that in 1981 (Table 1). The fleet was comprised basically of longliners and baitboats. These vessels took 70.1 and 21 percent, repectively, of the total 1982 catch. Trollers and one purse seiner took 4.8 and 3.9 percent, respectively, of the total catches in the same year.

1.3 The catches

Total catches (Fig. 2) corresponding to 1982 were 8,595 MT, the lowest recorded in the last few years. This represents 82 percent of the total catch taken in 1981 and 73 percent of that taken in 1980, a year of record catches (11,800 MT). These declines have been due mainly to the low longline catches since 1980 (Fig. 3).

The most important species was still yellowfin (Fig. 2), and represented 43.6 percent of the total catches. Other species, in order of importance, were: skipjack (15.4 per-

Original report in Spanish.

cent of the total catch), swordfish (8.0 percent), blackfin (7.2 percent), billfishes (6.9 percent), bigeye (6.0 percent), mackerels (5.5 percent), blue marlin (5.0 percent), albacore (1.3 percent) and Atlantic little tuna (0.9 percent).

It is expected that catches of tunas and tuna-like species at the close of 1983 will be 10 percent less than those of 1982 with a similar species composition.

2. Research activities

2.1 Exploratory fishing

In 1981, 1982 and 1983 experimental fishing was carried out in the Exclusive Economic Zone of Cuba by two shrimp trawlers of 124 GRT converted to tuna longliners. The purpose of this experimental fishing was to determine the feasibility of developing this type of fishing around Cuba. In 1983 a medium purse seiner also conducted exploratory fishing with the same objective.

2.2 Sampling

Sampling continued on landings of skipjack and blackfin tuna taken by the baitboat fisheries in the Cuban EEZ. Biological sampling was initiated on-board short and medium-range longliners which operate in Cuban waters.

3. Participation in meetings and training courses

Cuban scientists participated in the Skipjack Conference, marking the end of the "International Skipjack Year Program". Cuban scientists also participated in a training course on sampling and statistics. Both events were held at the "Centro Costero de Canarias" (Santa Cruz de Tenerife, Spain).

4. Statistics

In 1982 Cuba submitted a finer species breakdown of the catches from the baitboat fisheries. Catch data on yellowfin, skipjack, Atlantic little tuna and blackfin taken by these fisheries were submitted to ICCAT.

Catch and effort data corresponding to 1982 (Form 1.1, 1.2 and 2) were sent to ICCAT as well as biological information on skipjack and blackfin tuna catches taken in the Cuban EEZ (Form 3.4 and 3.5).

5. References

5.1 Skipjack Conference

Three documents were pesented to the Tenerife Skipjack Conference. These will be included in the formal Skipjack Conference publication.

5.2 SCRS

One document was presented to the 1983 SCRS Meeting (see Appendix 2 to Annex 10). This paper is included in the Collective Volume of Scientific Papers, Vol. XX.

Table 1. Composition of the Cuban fleet which catches tunas and tuna-like species in the Atlantic , by GRT, gear, species and area

		1982				
GRT	*LL*	*BB*	*PS*	*Troll*	*Species caught*	*Area of operation*
0 - 50				60*	Spanish mackerel, serrucho, wahoo;	Cuban EEZ
	60*				Tunas and tuna-like fishes	Cuban EEZ
51 - 150		67			Skipjack, blackfin tuna, Atlantic little tuna;	Cuban EEZ
	2				Tunas and tuna-like fishes	Cuban EEZ
151 - 200						
201 - 500	3				Tunas and tuna-like fishes;	Central Atlantic
			1		Tunas	Gulf of Guinea
+ 500	18				Tunas and tuna-like fishes	Central Atlantic

*Part of the year fished Spanish mackerel and serrucho; rest of the year fished tunas and tuna-like fishes.

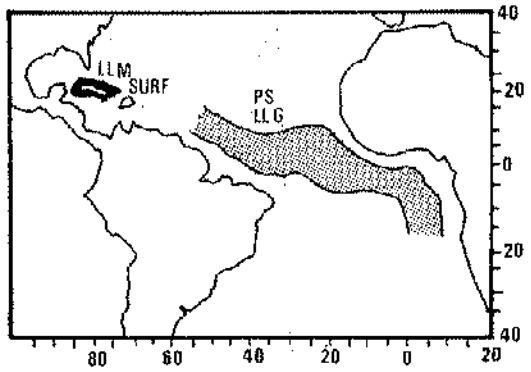


Fig. 1. Normal fishing area for Cuban vessels.

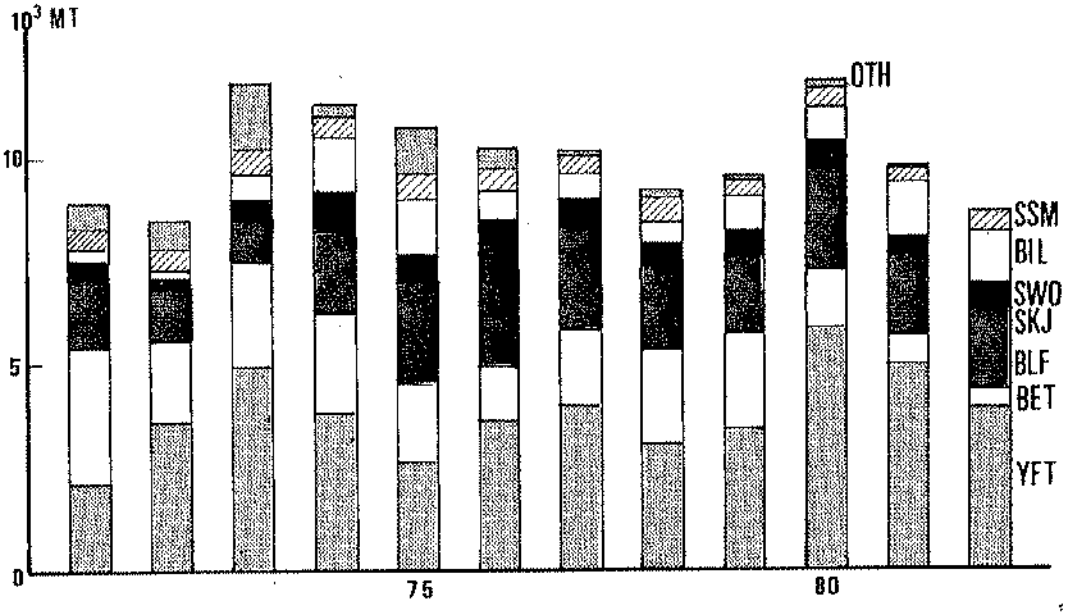


Fig. 2. Cuban tuna and tuna-like catches by species (1971-1982).

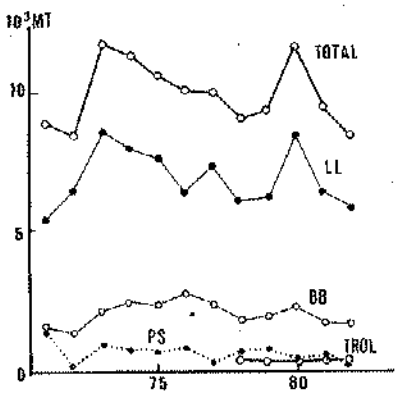


Fig. 3. Cuban tuna catches by gear (1971-1982).

REPORT ON RESEARCH – FRANCE

1. Status of fishing

	1976	*1977*	*1978*	*1979*	*1980*	*1981*	*1982*
Albacore	6.7	6.8	8.4	8.0	4.2	3.3	3.6
Yellowfin. . . .	48.0	37.9	41.6	38.7	43.6	40.6	29.2
Skipjack	18.4	14.8	19.9	15.2	22.5	27.2	26.1
Bigeye.	1.0	3.0	2.2	3.1	0.8	0.4	3.0
Bluefin	3.8	3.7	2.3	1.8	1.7	2.4	5.0
Total. . . . . (1,000 MT)	77.9	76.2	74.4	66.8	72.8	73.9	66.9

In 1982, tuna landings showed a strong decrease compared to the previous two years. The very low yellowfin catches were the cause for this decrease. Bigeye catches returned to the 1979 level. Bluefin catches show an overall increase since 1979 and the 1982 catch is twice the 1981 bluefin catch. This is due essentially to the excellent results of the 1982 Mediterranean cruise.

The peninsular albacore catch continued to decline to 2,800 MT in 1982, after a decrease in fishing effort. However, this species is now taken in the tropical area in quite important amounts (800 MT).

2. Research

The major organizations which carry out tuna research programs are the "Institut Scientifique et Technique des Pêches Maritimes" (ISTPM), the "Office de la Recherche Scientifique et Technique Outre-Mer" (ORSTOM), and the "Centre National pour l'Exploitation des Océans-Centre Océanologique de Bretagne" (CNEXO-COB).

2.1 Albacore

An exploratory cruise in areas located relatively far from the traditional fisheries was carried out in August by the R/V "La Perle". During this cruise, partial freezing

Original report in French.

was attempted on individuals of different sizes. The results obtained were encouraging. An analysis of the hydrological condition showed the very southerly position of the 18°C isotherm and the absence of thermal fronts which are important in catching albacore. Exploration of the new area produced largely positive results in that large schools of mature individuals were discovered.

Collection of catch, effort, and age composition data continued in 1982. Processing of these data (up till now done by the COB) will be carried out by the data processing centers of the national statistical network.

2.2 Bluefin

Bluefin sampling was continued in the Mediterranean on that part of the stock exploited by the 22 French purse seiners.

2.3 Tropical tunas

As in the past, processing of FISM statistics was done by France in close collaboration with the countries concerned (Ivory Coast, Senegal and Morocco). Research work carried out by ORSTOM scientists was concentrated on yellowfin (state-of-the-stock analysis) and on skipjack. The skipjack research corresponded to the final phase of data processing and analysis of the results of the Skipjack Program.

The research done by France was generally carried out in connection with national scientists of research centers in Senegal and Ivory Coast. French scientists collaborated in sixteen scientific papers which were presented to the Skipjack Conference (Tenerife, June, 1982). These papers cover many activities of the Program such as environmental studies, stock structure, reproduction, migration, mortality, growth, recruitment, effort analysis, state-of-the-stock analysis and its potential, etc.

3. References

3.1 Skipjack Confernce

As noted above, 16 documents were presented to the Skipjack Conference. These will be included in the formal Skipjack Conference publication.

3.2 SCRS

Seven documents were presented to the 1983 SCRS Meeting (see Appendix 2 to Annex 10). These papers are included in the Collective Volume of Scientific Papers, Vol. XX.

GHANA NATIONAL REPORT – TUNA FISHERY, 1982

1. Tuna fleet

A total of 47 tuna vessels operated from Tema in 1982. These consisted of 40 baitboats and 7 purse seiners. Twenty-four of the baitboats and 6 of the purse seiners were Ghanaian, while the rest were foreign flag vessels. In comparison, a total of 41 vessels operated in 1981; of these, 24 were Ghanaian and 17 were foreign flag vessels.

The Ghanaian fleet that operated in 1982 consisted of the following vessels:

Vessel	*Gear*	*GRT*
Afko No. 301	Baitboat	254.46
Afko No. 303	"	284.28
Afko No. 305	"	440.41
Afko No. 306	"	439.89
Afko No. 307	"	440.24
Afko No. 308	"	450.27
Afko No. 310	"	253.39
Afko No. 311	"	284.73
Kass No. 101	"	253.00
Kass No. 102	"	254.25
Mary Radine	"	283.88
Fernanda Marisa	"	282.94
Lois 11	"	284.76
Gbese No. 6*	"	416.90
Gbese No. 7*	"	416.90
Gbese No. 8*	"	416.90
Gbese No. 9*	"	416.90
Kwamina Nortey*	"	284.76
Big John*	"	284.76
Manko Star	"	342.04
Nick "T"	"	282.94
Brenya	"	249.26
Obaatan	"	245.00
Joy	"	253.88
Gold Coast	Purse seiner	958.00
Marian Rosina	"	898.06
Wansima	"	898.00
Pioneer Two	"	299.00
Captain Stendal	"	898.06
Donna "H"	"	898.00

*These vessels operated under foreign flag up to September, 1982, when they changed to Ghanaian flag.

Original report in English.

The foreign fleet consisted of the following:

Flag	*Gear*	*Number*	*GRT*
Japan	Baitboat	9	284.59 - 379.59
Korea	"	5	416.90 - 416.95
Panama	"	2	454.71
Japan	Purse seine	1	

The Ghanaian artisanal fleet continued to catch tunas and related species in 1982. The fleet used specially designed drift set nets.

2. Landings

The following landings, in metric tons, were made by foreign and Ghanaian flag vessels in 1982.

Species	*Foreign flag*	*Ghanaian Industrial*	*Ghanaian Artisanal*	*Total*
Yellowfin	1110.398	4150.782	---	5261.18
Bigeye	17.662	529.327	---	546.989
Skipjack	11041.592	17494.385	107.22	28643.197
Black skipjack	---	617.646	1522.5	2140.146
Frigate tuna	---	---	1009.07	1009.07
Sailfish	---	---	15.69	15.69
Others	5190.994	6087.228	482.	11760.222
Total	17360.646	28879.368	3136.48	49376.494

Black skipjack includes *Euthynnus alletteratus* and *Sarda sarda*. Other species include broken tuna (of any species) and *Elegatis bipinnulatus*.

The total quarterly landings of the industrial baitboat fleet, in metric tons, were as follows:

Species	*1st Quarter*	*2nd Quarter*	*3rd Quarter*	*4th Quarter*	*Total*
Yellowfin	460.142	692.842	363.484	203.916	1720.748
Bigeye	46.785	2.128	3.768	---	52.681
Skipjack	6264.365	5428.268	6140.174	6783.087	24615.894
Black skipjack	0.206	0.090	---	0.528	0.824
Others	2892.955	2537.660	2867.858	2773.295	11071.768
Total	9664.453	8660.988	9375.648	9760.826	37461.915

The total quarterly landings of the industrial purse seine fleet, in metric tons, were as follows:

Species	*1st Quarter*	*2nd Quarter*	*3rd Quarter*	*4th Quarter*	*Total*
Yellowfin	1341.883	766.650	1020.489	418.410	3547.432
Bigeye	241.029	85.698	120.101	47.480	494.308
Skipjack	1218.977	406.044	1735.944	559.118	3920.083
Black skipjack	219.016	17.892	207.682	172.232	616.822
Others	35.155	3.323	163.732	4.244	206.454
Total	3056.060	1279.607	3247.948	1201.484	8785.099

3. Research

During the year, collection of catch statistics (Task I and II) continued in addition to analysis of data and samples collected for the International Skipjack Year Program.

i) Studies were continued on length frequency distributions, sex structure, maturity, fecundity and feeding of the three tropical tuna species, namely, yellowfin, bigeye and skipjack. A total of 3,868 yellowfin, 4,812 skipjack and 83 bigeye were measured during the year. The length frequency distributions continued to show the predominance of young yellowfin and bigeye off Ghana.

ii) Port sampling was continued and improved. Ghana participated very actively in the tag recovery and return exercises for the International Skipjack Year Program. During the year, a total of 360 tags were recovered and returned to the institutions that released them.

iii) Ghana also participated in the preliminary analyses of the FISM data, including data from Ghana, for the ISYP in Dakar.

4. Research programs for 1983-84

Research programs for 1983-84 include the following:

a) Analyses of data and samples for the International Skipjack Year Program.

b) Studies on gonado-somatic indices of skipjack.

c) Improvement in Task II statistics and size sampling.

d) Improvement in logbook coverage.

e) Research programs will be reviewed in accordance with the results of the ISYP.

NATIONAL REPORT OF IVORY COAST

by

F. X. BARD and J. B. AMON KOTHIAS

1. Statistics

1.1 National production

Tunas landed during the last three years by the Ivory Coast fleet (comprised of eight purse seiners) are broken down as follows:

	1980	*1981*	*1982*
Yellowfin (YFT)	9,847	9,913	8,829
Skipjack (SKJ)	5,774	7,495	8,310
Bigeye (BET)	231	59	356
Albacore (ALB)	77	93	128
Total.	15,929	17,560	17,623

The catches remained relatively stable. Although the proportion of skipjack increased, there was an overall decrease of about 20 percent in the 1983 catch in spite of maintaining constant fishing effort.

1.2 Overall activities of the tuna fleet

The port of Abidjan is the leading Atlantic tuna port. A re-estimation showed that 145,000 MT of tunas were landed or transshipped in Abidjan in 1982, based on improved data of the commerical network.

1.3 Specific statistical activities

The "Centre de Recherches Océanographiques" of Abidjan continued collecting regular statistics from the various fleets in accordance with the diverse agreements with

Original report in French.

the governments of the relevant tuna vessels. These can be summed up as follows:

Fleet	*Coverage rate* TASK I	TASK II	*No. of fish measured in 1982*
FISM	100 °/o	100 °/o	65,000
Spain	80 °/o	80 °/o	8,000
Other PS	?	?	1,000
BB	?	?	500

The uncertainty in the Task I and Task II data coverage rates for the last two fleets is due to the lack of precise agreements with the countries concerned. This should be resolved in the near future.

2. Research

Research carried out by Ivory Coast in 1982 was esssentially centered on skipjack tuna, within the framework of the International Skipjack Year Program. Some highlights were:

- Tagging: During the Skipjack Program, the CRO recovered a total of about 1,300 tags, with pertinent information. This represents considerable work.

- Data analysis: Ivory Coast scientists actively participated in the various stages of processing of data collected on skipjack. In particular, the results of tagging experiments carried out are valuable to evaluate migration patterns, growth and mortality rates. Analyses of the components of the fishing power of seiner type tuna vessels were also carried out. Lastly, studies on the effects of the environment on the vulnerability of skipjack schools were presented.

3. References

3.1 Skipjack Conference

Seven documents were presented by Ivory Coast to the Tenerife Skipjack Conference. These will be included in the formal Skipjack Conference publication.

JAPANESE TUNA FISHERY AND RESEARCH IN THE ATLANTIC, 1982-83

by

S. KUME
FAR SEAS FISHERIES RESEARCH LABORATORY (FSFRL)

Japanese tuna fishing in the Atlantic was initiated by the longline fishery in 1957. Historical annual catches by species are shown in Figure 1. During 1982-83, three types of gears were active in the Atlantic. The longline fishery was expanded to the entire Atlantic in the mid-1960's and recorded a peak tuna catch of 134,000 MT in 1965. Thereafter, its activities exhibited a decreasing trend and the catch leveled at 22,000 to 28,000 MT during the late 1970's (Figure 2). The 1982 longline catch showed an upward trend and the catch amounted to about 50,000 MT. The pole-and-line fishery operating in the Gulf of Guinea continued decreasing its fleet size, and the 1982 catch declined to about 10,000 MT, the lowest for the past five years. One purse seiner, which resumed fishing in early 1982, produced about 2,300 MT of tropical tunas, and is continuing its operations in 1983.

Japanese fishermen have operated under the regulations of the International Commission for the Conservation of Atlantic Tunas (ICCAT) imposed on bluefin, yellowfin and bigeye tunas, and are subject to relevant governmental regulatory measures. In May and June of 1982 and 1983, a patrol boat was dispatched to monitor the Atlantic longline fleet for bluefin tuna fishing.

The statistical data requirements have been performed as assigned by the Standing Committee on Research and Statistics (SCRS), and the results of the scientific research have contributed to a better understanding of Atlantic tuna and tuna-like fishes and fisheries at both the SCRS regular and intersessional meetings.

1. Fishing activities

The total catch of tuna and tuna-like fishes by the Japanese Atlantic tuna fisheries amounted to 63,172 MT in 1982, about 19 percent higher than that of the preceding year (Table 1). The longline catch, representing 80 percent of the total, increased to 50,300 MT from 36,800 MT in 1981, whereas the pole-and-line catch decreased to 10,600 MT in 1982, 35 percent less than than of 1981. The catch of the purse seine fishery amounted to 2,300 MT in 1982.

Original report in English.

1.1 The longline fishery

The geographic coverage of the longline fishery in 1982 ranged throughout the entire Atlantic, except for the central regions of the northern and southern hemispheres and was essentially the same as that of recent years. It is pointed out that more longliners concentrated in the bigeye fishing grounds of the tropical and sub-tropical areas, which resulted in an increase in the bigeye catch to about two-thirds of the total longline catch in 1982 (Table 3). On the other hand, the catch of southern bluefin tuna declined due to the decrease in longliners fishing for this species in the Atlantic. The number of longline boats which operated in the Atlantic decreased by 16 percent, from 320 in 1981 to 269 in 1982 (Table 2). A further decline in the number of boats was reported in the first half of 1983.

1.2 The pole-and-line fishery

The catch of the fleet based at Tema, Ghana, has predominantly been skipjack, which accounted for 85 percent of the total pole-and-line catch in 1982. As is shown in Table 2, the fleet continued to decrease in recent years and was reduced to four vessels in 1983.

1.3 The purse seine fishery

One Japanese purse seine vessel has been operating in the Gulf of Guinea since March, 1982. No other purse seiner has participated until now. The predominant species of the catch in 1982 was skipjack, representing about 63 percent of the catch of 2,250 MT, followed by the yellowfin tuna catch (36 percent).

2. Research activities

Scientific research on Atlantic tunas and billfishes was continued by the Far Seas Fisheries Research Laboratory (FSFRL) in 1982 and 1983. In 1983, Japanese scientists participated in three intersessional meetings of the SCRS: the Trapani Bluefin Data Preparatory Meeting (May, 1983), the Tenerife Skipjack Conference (June, 1983), and the Tsukuba-Shimizu Bluefin Workshop (August-September, 1983).

2.1 Fishery statistics

Annual catch statistics up to 1982 (final) Task I were reported to ICCAT. The Task II statistics reported include final 1981 longline data and revised pole-and-line data for 1981 and 1982. Task I pole-and-line data were updated according to this revision of Task II data. Size frequency statistics (biological sampling) have been collected through size measurement on board the tuna boats in the Atlantic. Compiled length data for 1981 were reported to ICCAT.

2.2 International Skipjack Year Program (ISYP)

The Skipjack Conference was held at Tenerife in June, 1983, to synthesize the research activities carried out during the ISYP. Japanese scientists contributed three papers to the Conference (see Reference section).

2.3 Tuna biology and stock assessment

A Bluefin Workshop was held in Japan from August 31 to September 8, 1983. The review of the size data base was completed by using the computer facilities at the Tsukuba Center and the output data file was distributed to participating bluefin scientists. At the Shimizu segment of the Workshop, discussions were carried out on stock assessment methodology of Atlantic bluefin resources.

Effort standardization was routinely conducted to estimate effective effort for some species caught by the longline fishery for the years up to 1981. A cooperative study with Taiwan University was continued as to the effort standardization of Atlantic albacore. The results of studies on the biology and population dynamics of the Atlantic tunas and billfishes are being presented at the 1983 SCRS meeting.

3. References

3.1 Research documents presented at the Tenerife Skipjack Conference

Three documents were presented to the Skipjack Conference. These will be included in the formal Skipjack Conference publication.

3.2 Research documents presented at the 1983 SCRS meeting

Seven scientific documents were presented to the 1983 SCRS Meeting (see Appendix 2 to Annex 10). These papers are included in the Collective Volume of Scientific Papers, Vol. XX.

Table 1. Japanese catch (MT) of tuna and tuna-like fishes by type of fisheries, Atlantic Ocean and Mediterranean Sea, 1978-82

Type of fishery	*1978*	*1979*	*1980*	*1981*	*1982*
Total.	38,882	44,480	48,833	52,975	63,172
LL (Home-based) . . .	21,690	27,613	34,765	36,797	50,302
Pole-and-line.	17,192	16,867	14,068	16,178	10,620
Purse seine	---	---	---	---	2,250

Table 2. Annual number of Japanese tuna boats which operated in the Atlantic Ocean and Mediterranean Sea, 1978-82

Type of fishery	*1978*	*1979*	*1980*	*1981*	*1982*
LL (Home-based) . .	216	249	300	320	269
Pole-and-line.	19	15	12	10	7
Purse seine	---	---	---	---	1

Table 3. Catch (MT) of tunas and tuna-like fishes taken by the Japanese Atlantic longline fishery, 1978-82

Year	*1978*	*1979*	*1980*	*1981*	*1982*
TOTAL	21,690	27,613	34,765	36,797	50,302
ATLANTIC					
Sub-total	21,627	27,511	34,645	36,696	49,336
Albacore	666	1,324	1,369	2,298	1,350
Bigeye	9,301	11,957	20,477	21,044	32,867
Bluefin	3,721	4,251	4,816	4,286	2,865
S. bluefin	4,651	6,192	2,116	1,667	643
Yellowfin	1,923	1,986	2,839	4,145	6,062
Swordfish	853	968	2,107	2,232	3,723
Blue marlin*	69	134	308	468	1,132
White marlin	41	57	106	143	111
Sailfish**	20	39	55	94	173
Others	382	603	452	319	410
MEDITERRANEAN					
Sub-total	63	102	120	101	966
Bluefin	61	99	119	100	961
Swordfish	2	3	1	1	5

*Includes a minor amount of black marlin.

**Includes shortbill spearfish.

Table 4. Catch (MT) of tunas and tuna-like fishes landed by the Japanese pole-and-line fishery, 1978-82

Year	*1978*	*1979*	*1980*	*1981*	*1982*
Total	*17,192*	*16,867*	*14,068*	*16,178*	*10,620*
Albacore	0	0	0	0	0
Bigeye	1,201	582	243	184	95
Yellowfin	807	573	697	2,564	1,752
Skipjack	14,614	14,686	12,304	12,935	8,520
Others	570	1,026	824	495	253

Table 5. Catches (MT) of tuna taken by the Japanese Atlantic purse seine fishery, 1977-1982

Year	*1977 ---- 1981*	*1982*
Total		*2,250*
Bigeye	-- no fishery --	30
Yellowfin	-- no fishery --	810
Skipjack	-- no fishery --	1,410

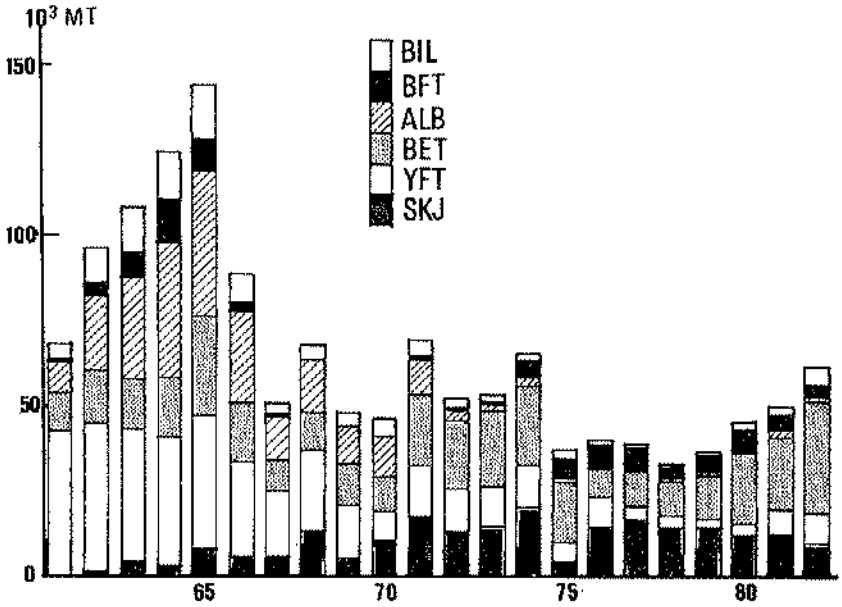


Fig. 1. Annual yield of tuna and billfish caught by the Japanese fishery, by species, 1961-1982.

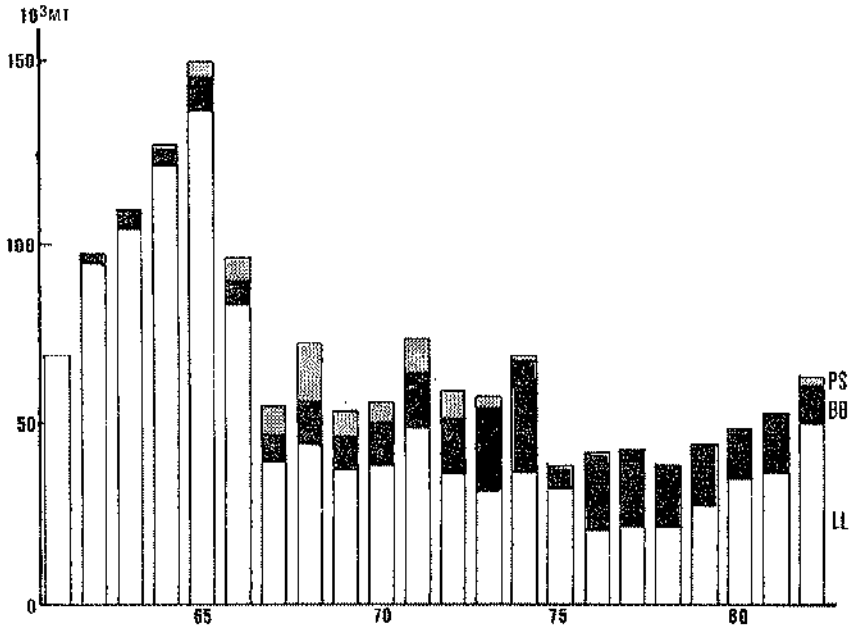


Fig. 2. Annual yield of tuna and billfish caught by the Japanese fishery, by type of fishery, 1961-1982.

KOREAN TUNA FISHERIES AND RESEARCH ACTIVITIES, 1982-1983

1. Fisheries

A total of 56 fishing vessels, 8 less than in 1981, operated for tunas and related fishes in the Atlantic Ocean in 1982. The total catch by these vessels amounted to about 24,536 MT, which shows a decrease of 22.9 percent over last year (Table 1). Of the total catch, 85.7 percent was taken by 52 longliners and 14.3 percent was taken by 4 baitboats.

The total catch during the first half of 1983 was estimated to be 10,549 MT from the two fishing gears mentioned above, an 11.3 percent decrease compared to the previous year.

1.1 The longline fishery

In 1982, 52 longliners conducted their fishing activities from near 25°N to 10°S in the area east of 20°W, and 25°N to 30°S of west of 20°W. Fishing operations within those areas were concentrated in the northern tropical area from the Equator to 10°N.

Catches totaled 21,033 MT, and showed a 5.7 percent decrease over the 1981 catch (Table 1). The composition of the catch by major species is broken down as follows:

- 10,615 MT bigeye (50.5 percent of the total catch)
- 5,872 MT yellowfin (27.9 percent)
- 1,889 MT albacore (9.0 percent)
- 684 MT swordfish (3.2 percent)

Bigeye tuna catches comprised the highest proportion of the total catch, as has been the case during the previous four years, but these catches decreased approximately 9.0 percent compared to last year. Yellowfin catches showed a slight decrease. Albacore, representing 9.0 percent of the total catch, increased by 16.6 percent (Table 2).

The total longline catch has maintained two trends up to this year, one has been the high level of the catch (over 30,000 MT) from 1971 to 1977, and the other has been the low catch level (20,000 MT) during 1979-1982 (Figure 1). The decline in recent years is due to the decrease of fishing vessels and to the decrease in the catch of target species, such as yellowfin and albacore.

Original report in English.

1.2 The pole-and-line fishery

In 1982, four baitboats based in Tema, Ghana, operated for tropical tunas in the Gulf of Guinea as in past years. The catch by these boats totaled 3,503 MT, a 63.2 percent decrease compared to 1981 (Table 1).

The catch composition, by species, is as follows:

- 3,386 MT skipjack (96.6 percent of the total catch)
- 22 MT yellowfin (0.6 percent)

Skipjack showed a decline of 58.1 percent compared to the previous year, and yellowfin catches decreased 97.7 percent (Table 3). The total catch by this fishery has decreased since 1979 (Figure 1). This is attributed to the decrease in the number of fishing boats and to the ineffective effort exerted on the fishing grounds.

Up to May, 1983, however, two Korean flag baitboats participated in fishing operations; afterwards there were no operations in the area.

2. Research activities

In 1982 and 1983 research activities on Atlantic tunas and related species have been carried out as in past years by the Fisheries Research and Development Agency (FRDA) in association with Korean fishermen. Catch/effort and biological data from commercial fishing vessels were collected. Tagging activities and port sampling were also carried out in the Gulf of Guinea during 1982 as a part of the International Skipjack Year Program (ISYP).

The 1982 data for Task I, II and size frequency statistics were submitted to the ICCAT. With regard to the ISYP, a total of 718 dart tags were released in the Gulf of Guinea during the years 1981-1982. There was a recovery rate of about 2.65 percent. Korean baitboats recovered 8 tags in 1982 which had been released by other ICCAT member countries for the ISYP. All of these data were made available to support the Skipjack Program through regular ICCAT channels.

Table 1. Korean catch (in MT and number of boats) for tunas and tuna-like fishes in the Atlantic Ocean, 1971-1982

Year	Number of boats			Catch (MT)		
	Longline	Baitboat	Total	Longline	Baitboat	Total
1971	117	-	117	36,737	-	36,737
1972	105	2	107	35,736	-	35,736
1973	106	3	109	32,051	1,822	33,873
1974	124	8	132	33,568	4,412	37,980
1975	118	8	126	38,819	7,653	46,472
1976	121	6	127	31,575	3,339	34,914
1977	120	15	135	38,849	6,202	45,051
1978	97	20	117	29,094	10,364	39,458
1979	66	18	84	20,069	17,188	37,257
1980	54	16	70	18,952	9,901	28,853
1981	56	8	64	22,306	9,529	31,835
1982	52	4	56	21,033	3,503	24,536

Table 2. Catch (in MT) by species of tunas and tuna-like fishes taken by the Korean longliners in the Atlantic Ocean, 1971-1982

Year	*Bluefin*	*Yellow-fin*	*Albacore*	*Bigeye*	*Skipjack*	*Sword-fish*	*Blue marlin*	*White marlin*	*Sail-fish*	*Other Billfishes*	*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	7,376	116	----	----	----	----	1,335	3,951	33,568
1975	23	15,344	6,073	10,162	196	451	----	----	----	990	5,580	38,819
1976	10	11,211	8,755	6,747	26	1,147	----	----	----	1,015	2,664	31,575
1977	3	16,347	9,345	7,610	9	1,240	164	202	141	449	3,339	38,849
1978	----	11,512	4,418	9,182	42	1,333	177	79	29	111	2,211	29,094
1979	2	6,997	3,875	7,035	2	606	95	13	20	96	1,058	20,069
1980	----	5,869	1,487	8,963	4	683	9	1	5	167	1,764	18,952
1981	----	6,650	1,620	11,682	47	447	81	13	11	171	1,584	22,306
1982	----	5,872	1,889	10,615	21	684	17	24	16	114	1,781	21,033

Table 3. Catch (in MT) by species of tunas and tuna-like fishes taken by Korean baitboats in the Atlantic Ocean, 1973-82

Year	*Yellowfin*	*Bigeye*	*Skipjack*	*Albacore*	*Unclassified & others*	*Total*
1973	900	–	922	–	–	1,822
1974	2,169	–	2,123	–	120	4,412
1975	1,259	1,750	4,469	–	175	7,653
1976	365	810	1,948	–	216	3,339
1977	1,075	640	3,600	–	887	6,202
1978	941	965	8,132	43	283	10,364
1979	2,871	1,712	12,017	–	588	17,188
1980	2,122	563	6,718	113	385	9,901
1981	947	61	8,085	–	436	9,529
1982	22	–	3,386	–	95	3,503

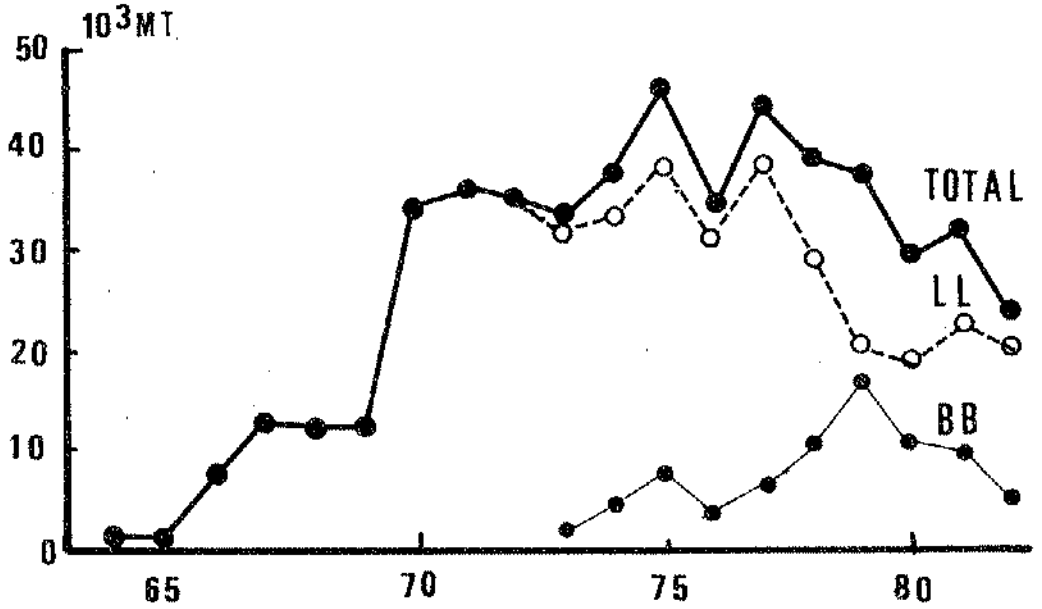


Fig. 1. Annual yield of the Korean tuna fishery in the Atlantic Ocean, 1964-1982.

NATIONAL REPORT OF PORTUGAL

In 1982, Portuguese catches of tuna and tuna-like fishes totaled 8,865 MT. This catch is broken down as follows:

a) by species – 5,531 MT skipjack, 1,859 MT bigeye, 981.5 MT yellowfin, 322 MT albacore, 40.5 MT bluefin, 10 MT swordfish, and 121 MT Atlantic bonito and other species;

b) by administrative regions – 1,888 MT mainland, 5,979 MT Azores, and 998 MT Madeira.

In 1982, the artisanal boats and two purse seiners registered in the ports of continental Portugal (mainland) captured 1,888 MT (119.5 MT were captured in Iberian waters; 868.5 MT were captured in Gulf of Guinea waters, and 900 MT were captured in other eastern Atlantic waters).

These 1,888 MT of tunas and tuna-like fishes included 948.5 MT yellowfin, 779 MT skipjack, 10.5 MT bluefin, 24 MT bigeye, 16 MT albacore, and 110 MT Atlantic bonito and other species.

A total of 5,979 MT of tunas were taken in 1982 by Azores including 1,129 MT bigeye, 4,599 MT skipjack, 188 MT albacore, 18 MT yellowfin, 30 MT bluefin, 4 MT swordfish, and 11 MT other species.

Madeira's catches in 1982 totaled 998 MT, of which 706 MT were bigeye, 153 MT skipjack, 118 MT albacore, 15 MT yellowfin and 6 MT swordfish.

For the current year (1983) estimates for Azores and Madeira indicate that the total catch is at the same level as in 1982 with a marked increase in bigeye and yellowfin catches and a significant (80 percent) decline in skipjack catches.

During this year 2,820 MT bigeye, 880 MT skipjack, and 1,650 MT albacore were taken in the Azores.

Research activities were conducted on the principal species (Task I, Task II, and biological sampling).

In 1983, in the Azores, logbooks were available to captains of the baitboat fleet; a tuna aggregation device was set in the water and anchored in a traditional fishing area. The results are not yet known since the device was placed at the end of the fishing season.

Trial fishing operations using seines were conducted in 1982 and in 1983 in the Azores area, and these operations are being monitored by Portuguese scientists.

Original report in English.

REPORT ON TUNA FISHING AND RESEARCH IN SENEGAL IN 1982 – 1983

by

P. CAYRE

1. The tuna fishery

1.1 Yellowfin, skipjack and bigeye

In 1982 the tuna fleet based at Dakar was comprised of 24 baitboats and 5 purse seiners. Since 1980 there has been a regular decrease in the number of baitboats, from 28 in 1980 to 23 in 1983 (Table 1).

For 1982, catches of yellowfin, skipjack and bigeye reached a good level (12,349 MT) (Table 1). This increase over catches reported in 1981 (10,366 MT) is due essentially to good skipjack catches taken by baitboats (4,498 MT) and by purse seiners (1,735 MT).

Landings and transshipments of the FISM fleet at Dakar in 1982 (12,300 MT) are similar to those of 1981 (13,300 MT). Spanish landings also remained very stable (6,516 MT) in 1982.

Preliminary estimates for 1983 (Table 1) seem to indicate a particularly poor year since landings up to August 31, 1983, were only 3,950 MT, compared to 6,692 MT landed during the same period in 1982. This drop in landings is due mainly to weak skipjack catches.

1.2 Other species

Landings of small tunas (Table 2) in 1982 totaled 4,614 MT and were slightly higher than those in 1981 (3,390 MT) for both the artisanal fishery and the industrial fishery.

Sailfish catches (Table 3) have been increasing regularly (641 MT in 1982 compared to 529 MT in 1981) due to a more notable interest in catching this species by the artisanal fishery.

A longline fishery went into operation in 1983 in Senegalese waters. The yields of this fishery are high, especially as concerns swordfish catches (*Xiphias gladius*).

Original report in French.

2. Research

Sampling activities and data collection continued as in the past for the FISM as well as for the Spanish tuna vessels.

Collection of data on small tunas and sailfish was carried out as usual. The development of the beginning longline fishery also continued.

The year 1983 marked the end of the Skipjack Program. The majority of the research activities were centered on this species.

A working meeting was held in Dakar (March 21-26, 1983) to prepare the results presented in Tenerife (June 21-29, 1983) for the close of the Skipjack Program. Participants from a dozen countres as well as the ICCAT Secretariat helped to make this meeting a notable event for the success of the Skipjack Program.

At the Conference marking the close of the Skipjack Program (Tenerife, June 21-29, 1983) ten documents prepared at the CRO in Dakar were presented and will be included in the final report of the Program.

3. References

3.1 Skipjack Conference

As noted above, ten documents were presented to the Tenerife Skipjack Conference. These will be included in the formal Skipjack Conference publication to be published soon.

3.2 SCRS

Four documents were presented to the 1983 SCRS Meeting (see Appendix 2 to Annex 10). These papers are included in the Collective Volume of Scientific Papers, Vol. XX.

Table 1. The tuna fishery in Dakar, 1982-83

	Dakar-based			*Foreign vessels*		
	BB	*PS*	*Total*	*FISM*[1]	*Spain*[2]	*Total*[3]
1982 Catch (MT)						
No. of boats	24	5	29	26	16	42
Effort (days at sea)	3310	691		1468	---	
Yellowfin	2543.9	585.8	3129.7	7496.2	2746.4	10242.6
Skipjack	4497.7	1735.4	6233.1	4705.2	3656.3	8361.5
Bigeye	2427.1	558.8	2985.9	97.1	113.6	210.7
Total	9468.7	2880.0	12348.7	12298.5	6516.3	18814.8
1983 Catch (MT)[4]						
No. of boats	23	4	27	13		13
Effort (days at sea)	1143	617		851		
Yellowfin	1196.8	346.7	1543.5			
Yellowfin - Bigeye				3311.0		3311.0
Skipjack	1285.3	649.2	1934.5			
Bigeye	1141.9	330.7	1472.6	5110.3		5110.3
Total	2624.0	1326.6	3950.6	8421.3		8421.3

1. Landings and transshipments for 1982 and 1983.
2. 1982 landing data available.
3. The 1983 total (up to August 31, 1983) does not include Spanish landings.
4. Provisional data up to August 31, 1983.

Table 2. Landings (MT) of small tunas in Senegal (1981-1982)

Species	*1981* *Artisanal fishery*	*Commercial fishery*	*Total*	*1982* *Artisanal fishery*	*Commercial fishery*	*Total*
Atlantic little tuna *(E. alletteratus)*	1660	625	2285	2378	1006	3384
West African Spanish mackerel *(Scomberomorus tritor)*	490	0	490	310	0	310
Atlantic bonito *(Sarda sarda)*	615	0	615	920	0	920
TOTAL	2765	625	3390	3608	1006	4614

Table 3. Landings (MT) of sailfish (*Istiophorus albicans*) in Senegal in 1982

	Number of individuals	*Weight (MT)*	*Percent*	*Percent in 1981 Report*
Artisanal fishery	18,007	540.2	84.3	83.6
Sport fishery	2,284	68.5	10.7	16.4
Industrial fishery	1,067	32.0	5.0	---
TOTAL	21,358	640.7	100.0	100.0
1981 Report	17,641	529.3	---	---

SOUTH AFRICAN NATIONAL REPORT, 1982

1. The fishery

The total catch of 2,774 MT was 9 percent more than the catch of 1981 and consisted of 92 percent albacore, 5 percent bigeye, 2 percent yellowfin, 1 percent skipjack and a few swordfish. Compared to the catch of the previous year there was an increase of 37 percent in the catch of albacore, but a drop of 74 percent in the yellowfin catch.

The catch was landed by 98 sport fishing boats, 30 baitboats, 7 longliners and 3 purse seiners. Most of these boats were multi-purpose boats only fishing for tuna when they were readily available.

2. Biological sampling

Measurements of 200 albacore and 25 skipjack landed by South African boats were taken. Samples of albacore were measured from 118 foreign boats transshipping in Cape Town docks.

3. Environment

As part of the Benguela Ecology Programme an in-depth study was conducted of environmental factors influencing fish populations in the eastern Atlantic off the coast of South Africa.

Original report in English.

REPORT OF SPANISH TUNA FISHING AND RESEARCH, 1982 - 1983

by

A. GONZALEZ-GARCES
SPANISH OCEANOGRAPHIC INSTITUTE

1. Catches

Spanish catches of tunas and tuna-like fishes in 1982 reached 141,342 MT, and represented the largest annual catch taken by Spain in the Atlantic up to now. These catches show a 5,946 MT increase over those of 1981. This increase is due basically to the increased catches by the tropical fleet and the surface fleet in the Bay of Biscay.

The catches, in metric tons, of the principal species for the last five years have been as follows:

Year	*YFT*	*SKJ*	*BET*	*BFT*	*ALB*	*SWO*	*OTH*	*TOTAL*
1978	37,424	27,484	4,703	3,660	25,404	4,342	6,045	109,067
1979	39,353	20,888	5,080	2,643	29,810	3,382	1,793	102,901
1980	34,246	30,989	8,388	2,397	25,202	4,560	10,800	116,582
1981	50,866	38,192	7,739	2,428	22,631	5,134	8,307	135,396
1982	48,636	44,466	8,410	3,813	26,156	5,454	4,407	141,342

Spain catches tunas in four distinct areas: the tropical area, the Canary Islands, off the Peninsula in the Atlantic, and in the Mediterranean Sea.

1.1 Tropical fishery

Spain has been fishing in the tropical area since 1961, using a baitboat fleet which was slowly transformed into a fleet of large purse seiners. The tropical Spanish fleet which operated in the east Atlantic in 1982 was comprised of 46 purse seiners, two more than in 1981. The distribution of this fleet, according to vessel gross tonnage (GRT), was as follows:

Original report in Spanish.

No. of vessels	*GRT*
1	300 – 450
6	451 – 750
26	751 – 1250
13	over 1250

As of August 31, 1983, the fleet increased by five new vessels (two in the 451-750 GRT class and three in the over 1250 GRT class). One vessel, in the 751-1250 GRT class, was withdrawn. Therefore, the Spanish tropical purse seine fleet, as of the aforementioned date, was comprised of 50 vessels.

Catches by this fleet during the last three years were as follows:

Year	*YFT*	*SKJ*	*BET*	*ALB*	*OTH*	*TOTAL*
1980	34,169	28,827	4,354	0	5,800	73,130
1981	50,770	34,041	5,426	889	4,685	95,811
1982	48,251	41,100	6,574	106	2,461	98,492

As can be noted from the above, the total catch increased from 1981 to 1982. This increase is attributed principally to the increase in skipjack catches, since yellowfin, albacore and "others" decreased slightly. The "others" species category includes mainly two species, frigate tuna and Atlantic little tuna.

The total annual catches for 1983, estimated on the basis of catches taken up to August 31, will be about 40,000 MT for yellowfin and bigeye tunas combined, 20,000 MT skipjack and 1,500 MT other species.

1.2 Canary Islands

The Canary Islands fishery is conducted by a fleet comprised mainly of small vessels of less than 20 GRT which use live bait. In 1982 and 1983, the fleet size was the same as that for 1981, i.e., 256 vessels of less than 20 GRT, 34 vessels in the 20-50 GRT class and 24 vessels of 51-150 GRT. At the end of 1983 a 733 GRT longliner was put into operation.

Catches by this fishery, in MT by species for the last three years, are as follows:

Year	*YFT*	*SKJ*	*BET*	*BFT*	*ALB*	*TOTAL*
1980	77	2,162	4,034	397	518	7,188
1981	96	3,876	2,313	524	1,009	7,818
1982	385	3,366	1,449	43	519	5,762

Catches decreased appreciably from 1981 to 1982. This decrease affected all species, except yellowfin. However, the species breakdown remained the same as in 1981, i.e., skipjack is the principal species taken by the fishery, followed by bigeye and albacore. There was a considerable decrease in bigeye catches from 1980 to 1982, and in

1982 the catch of this species was only 36 percent that of 1980. There was also a significant decrease in bluefin tuna catches, down to less than 10 percent that of the 1981 bluefin catch.

1.3 Spanish peninsular fishery in the Atlantic

The fleet which operated in this fishery in 1982 was comprised of 289 baitboats, 263 trollers and 149 longliners; there were also three traps and an indeterminate number of vessels which take bluefin sporadically, although it is not the target species (for example, sardine vessels which encounter a bluefin school or trawlers which set hand lines to catch tunas during the night when they are resting from their trawl operations).

Catches in this area, in metric tons for the last three years, were as follows:

Year	*BFT*	*ALB*	*SWO*	*OTH**	*TOTAL*
1980	1,900	24,684	3,810	1,150	31,544
1981	1,683	19,833	4,014	1,580	27,109
1982	2,781	24,959	4,554	1,147	33,441

*"Others" include: bigeye, skipjack, frigate tuna, Atlantic little tuna and Atlantic bonito.

According to these data, Spanish peninsular catches in the Atlantic increased considerably (about 6,300 MT) from 1981 to 1983. This increase is due mainly to albacore and bluefin catches. As regards the latter species, the increase is due to trap catches, which went from 700 MT in the 1980-1981 period to 1,900 MT in 1982.

For 1983, a slight decrease in the total catch is foreseen. It is expected that bluefin tuna and swordfish catches will increase whereas declines are expected in albacore and "other" species catches.

1.4 Spanish peninsular fishery in the Mediterranean Sea

A somewhat varied fleet, such as that which operated in the Spanish peninsular Atlantic fishery, operated in this area. This fleet includes longliners, trollers, baitboats, small purse seiners, sport vessels and three traps.

Catches, in metric tons, in the last three years, were as follows:

Year	*BFT*	*ALB*	*SWO*	*BON*	*OTH*	*TOTAL*
1980	100	0	750	480	2,920	4,250
1981	227	900	1,120	710	1,700	4,657
1982	989	572	900	803	383	3,647

Catches in 1982 decreased by 1,000 MT with respect to 1981. This decrease was due to the low catches of "other" species. However, in the case of bluefin tuna, production increased considerably in 1982.

For 1983 it is estimated that overall catches will increase slightly as a result of the increase in production of all species.

2. Research

2.1 Tropical fishery

In 1982 coverage of Task II statistics was expanded and reached 83 percent. As regards sampling carried out this year, some 24,353 fish (10,166 yellowfin, 8,734 skipjack, 1,868 bigeye, and 3,584 individuals in the "others" category) were measured.

In 1982 and 1983, special attention was given to the analysis of data obtained by observers on board large purse seiners during the International Skipjack Year. Analysis centered on fishing effort of the Spanish fleet and on the characteristics of the individual sets. Some of this analysis work was carried out in collaboration with scientists of the C.R.O. of Ivory Coast and Senegal. During the last two years Spanish scientists participated in preparatory working group meetings for the Skipjack Conference which were held in Dakar, Senegal.

2.2 Canary Islands fishery

Just as in the case of the tropical tuna fishery, preferential attention was given in the Canary Islands to research connected with the International Skipjack Year and the Skipjack Conference. In 1982, some 2,240 skipjack were tagged and close to 2,000 skipjack gonads were analyzed for maturity studies. As a result, two documents were presented, one on tagging (presented to the Skipjack Conference) and one on sexual maturity (presented to the 1983 SCRS).

2.3 Spanish peninsular fisheries in the Atlantic and in the Mediterranean Sea

As regards albacore, the sampling network was maintained all along the Spanish coasts and 22,337 fish were sampled. Of these, 16,293 fish were from the troll fishery and 6,044 fish were from the baitboat fishery. This year dorsal fin ray spines were collected to study age and growth.

Sampling activities continued in 1983 and a cruise ("Albacore-83") was carried out in which 271 albacore and 2 bluefin tunas were tagged. Besides, stomachs of 88 albacore, 11 bigeye and 1 bluefin were collected for studies on feeding.

In the case of swordfish, 8,520 individuals were sampled in 1982 and a length-weight relation study was carried out on 2,306 fish. For 1983, as of October 31, some 10,000 swordfish were sampled. Also in 1983 a study was carried out on the species caught together with swordfish and a length-weight relation on these species is being prepared.

Besides routine size sampling carried out in the Mediterranean fishery, a research cruise was carried out on board a longliner to study yields, fishing areas and accompanying species. Fin ray spines were collected for future studies on growth.

A bluefin tagging cruise was carried out in 1982 and 395 fish were tagged. Another cruise was conducted in 1983 where 371 bluefin, 7 albacore and 1 bigeye were tagged. The age distribution of the bluefin tunas tagged was as follows:

Age	*1982*	*1983*
1	216	34
2	64	332
3	83	1
4	29	1
5	1	3
6	1	--
7	1	--
Total	395	371

The collection of parasites continued in 1982 and in 1983, mainly on the copecod *Elytrophora brachyptera* and the trematode *Nasikola klawei*, to study the mixing rate between the east and west bluefin stocks in the Atlantic. Samples were taken in the Atlantic as well as in the Mediterranean.

A size-age key was prepared which includes fish from 25 to 199 cm, by reading first dorsal fin spines. An emigration map was prepared for this species in the east Atlantic, western Mediterranean and Adriatic Seas based on bibliographical data and on information from fishing professionals.

In 1983 a review was carried out of catch-by-size data of all the Spanish bluefin tuna fisheries, both Atlantic and Mediterranean, from 1950 to 1982. This information was presented at the Data Preparatory Meeting on Bluefin Tuna held in Trapani, Italy. Two Spanish scientists participated in the working meeting. One Spanish scientist attended the Bluefin Workshop held in Tsukuba and Shimizu, Japan, in 1983.

In collaboration with the ICCAT Secretariat, samples of giant bluefin vertebrae were collected from the Barbate trap. Vertebrae were also collected from Age-0 bluefin tuna in the Mediterranean. These samples were later sent to the United States for use in stock identification studies using trace element analysis.

As regards small tunas, research work centered on three species: Atlantic bonito, frigate tuna and Atlantic little tuna. Intensive biological sampling was carried out on Atlantic bonito which served as a basis for preparation of a species synopsis.

3. References

3.1 Documents presented at the Skipjack Conference

Six documents were presented at the Tenerife Skipjack Conference. These will be included in the formal Skipjack Conference publication.

3.2 Documents presented at the 1983 SCRS Meeting

Ten scientific documents were presented at the 1983 SCRS Meeting. These papers are included in the Collective Volume of Scientific Papers, Vol. XX.

REVIEW OF UNITED STATES FISHERIES AND RESEARCH ACTIVITIES ON TUNAS AND TUNA-LIKE FISHES OF THE ATLANTIC OCEAN FOR 1982-1983

by

NATIONAL MARINE FISHERIES SERVICE*

1. The fisheries

United States commercial catches of Atlantic tunas and tuna-like species totaled approximately 14,500 metric tons (MT) in 1982 (Table 1). This was a decrease of about 20 percent from the 1981 catch. This decrease was due to lower catches of skipjack, yellowfin and bigeye tunas.

During 1982, U.S. vessels fishing for Atlantic tropical tunas operated under a minimum size reulation of 3.2 kg for yellowfin and bigeye tunas with a 3 percent allowance by weight per boat landing. U.S. vessels fishing for bluefin tuna operated under a minimum size regulation of 6.4 kg and a catch limitation.

1.1 Tropical tunas

United States commercial catches of Atlantic tropical tuna species (yellowfin, skipjack and bigeye) totaled about 2,000 MT in 1982, substantially lower than in 1981. This was due primarily to much reduced skipjack tuna catches.

Two large U.S. purse seiners participated in the Atlantic tropical tuna fishery in 1982. They caught 636 MT yellowfin tuna, 79 MT skipjack tuna and 345 MT bigeye tuna in the eastern Atlantic; 82 MT yellowfin tuna and 6 MT skipjack tuna were caught in the western Atlantic. Five small U.S. purse seiners, fishing primarily for bluefin tuna, took about 646 MT skipjack tuna off the U.S. east coast.

In 1982, the estimated number of undersized (less than 3.2 kg) Atlantic yellowfin tuna in the landings of the U.S. fleet was approximately 2 percent of the total number landed. No Atlantic bigeye tuna were sampled from the U.S. fleets's landings.

Through September, 1983, no large U.S. purse seiner had participated in the tropical Atlantic tuna fishery. U.S. imports of Atlantic tunas through July, 1983, were 38,489 MT, broken down as follows: 24,756 MT eastern Atlantic skipjack tuna, 9,236 MT western Atlantic skipjack tuna, 2,212 MT eastern Atlantic yellowfin tuna, 1,786 MT

*Prepared by staff members of the Southwest Fisheries Center, La Jolla, California, and the Southeast Fisheries Center, Miami, Florida.
Original report in English.

western Atlantic yellowfin tuna, and 505 MT western Atlantic bigeye tuna. There was no reported catch of eastern Atlantic bigeye tuna.

1.2 Temperate tunas and billfishes

Bluefin tuna catches by U.S. vessels operating in the Atlantic in 1982 amounted to 684 MT. The catch by various gears was as follows: 202 MT by purse seine, 134 MT by hand gear, 80 MT by harpoon, 200 MT by rod and reel, and 68 MT by longline.

Catches of Atlantic albacore tuna totaled 126 MT, slightly more than in recent years.

Atlantic billfish taken by recreational fishermen amounted to about 700 MT in 1982. Swordfish catches, primarily by longline gear, are estimated to be 3,746 MT in 1982, up 45 percent from 1981.

Through September, 1983, U.S. catches of bluefin tuna totaled 1,342 MT. The 1983 U.S. catch limit was set at 1,387 MT.

2. Research activities

Research on Atlantic tunas and tuna-like species is conducted at the Miami Laboratory of the Southeast Fisheries Center and at the La Jolla Laboratory of the Southwest Fisheries Center.

2.1 Southwest Fisheries Center

During 1982-1983, noteworthy research activities on Atlantic tuna at the La Jolla Laboratory included participation in the ICCAT-sponsored Skipjack Conference in Tenerife Island, Spain; collection of biological and fishery data from U.S. fisheries and completion of analyses for stock assessment of yellowfin and skipjack tunas for the 1983 SCRS Meeting.

Research in support of ICCAT's International Skipjack Year Program was presented by SWFC scientists at the ICCAT-sponsored Conference, held in Tenerife Island, Spain, June 20-30. At the Conference, SWFC scientists presented six papers dealing with biological research, stock assessment research, and fishery evaluation.

The 1982 catch of tuna and tuna-like fishes by U.S. fishermen was monitored and reported to ICCAT. U.S. and Venezuelan catches of yellowfin and skipjack tunas were sampled for length frequency. Foreign-caught Atlantic tunas transshipped to Puerto Rico were sampled for length frequency and species composition. The number of fish sampled was: 5,783 yellowfin tuna, 2,173 skipjack tuna, 1,094 bigeye tuna, and 100 albacore. These activities continued in 1983. Through July, 1,342 yellowfin tuna, 555 skipjack tuna, 408 bigeye tuna, 50 albacore tuna and 50 blackfin tuna were sampled in Puerto Rico.

SWFC scientists have completed stock assessments on yellowfin and skipjack tunas. For yellowfin and skipjack tuna stocks, assessment results, with respect to data and analysis techniques, were critically examined. Results are being presented at the 1983 SCRS Meeting.

2.2 Southeast Fisheries Center

Bluefin tuna research by the Miami Laboratory centered on development of new ICCAT data bases and on extensive analyses of catch and effort data. The SEFC also contributed to the development and improvement of ICCAT's bluefin catch-at-size data through intersessional workshops in Italy and Japan. The SEFC also organized a special committee of independent scientists to review periodically the progress of bluefin stock assessment work. In addition to this research, an icthyoplankton survey was carried out in the bluefin tuna spawning grounds in the Gulf of Mexico by the U.S. and Mexico, and research continued on the bluefin tuna stock identification problem using X-ray fluorescence.

Billfish research activities were expanded in 1983. Considerable effort was expended to improve and standardize the historical international data base. A two-year comprehensive stock assessment on sailfish was initiated. Preliminary investigations into the feasibility of using tagging data to estimate growth and mortality rates were conducted. Theoretical investigations into the performance of standard fisheries models were made and presented at the Second Pacific Coast Conference on Mathematical Modeling of Renewable Resources in Victoria, British Columbia, Canada. Data collection for estimating age and growth rates of blue and white marlin from skeletal hardparts was intensified, and a preliminary analysis was begun. Peer review and editing of papers presented at the International Workshop on Ageing Oceanic Pelagic Fishes (billfishes, swordfish and sharks), held in Miami, in 1982, were completed. The Proceedings are now in press.

In 1983 the collection of basic fishery statistics from the U.S. recreational billfish fishery by tournament and dock sampling was greatly expanded in order to census completely the total number of blue and white marlin caught by recreational fishermen. This census was similar to the one in 1981 of blue and white marlin caught in the Gulf of Mexico, the results of which have been recently analyzed by SEFC scientists. Tagging continued at a pace slightly ahead of the 3,000 billfish tagged in 1982. The scientifically valuable skeletal hardparts from a tagged white marlin at liberty nearly 12 years were obtained for age and growth studies.

3. References

3.1 SCRS Meeting

Twelve documents were presented to the 1983 SCRS Meeting (see Appendix 2 to Annex 10). These are included in the Collective Volume of Scientific Papers, Vol. XX.

Table 1. Catches and landings (MT) of Atlantic tunas and tuna-like fishes by American fishermen, 1967-82[1]

Year	*Blue-fin*	*Yellow-fin*[2,3]	*Albacore*	*Big-eye*[2]	*Little tunny*	*Skip-jack*[2]	*Bonito*	*Sword-fish*	*Spanish mackerel*	*King mackerel*	*Unclas-sified*	*Total*
1967	2,320	1,136	0	0	7	493	22	474	3,577	2,767	10	10,806
1968	807	5,941	0	18	6	3,314	43	274	5,342	2,813	2	18,560
1969	1,226	18,791	0	148	7	4,849	98	171	4,952	2,814	1	33,057
1970	3,327	9,029	0	195	158	11,752	83	287	5,506	3,050	--	33,387
1971	3,169	3,764	0	544	5	16,224	90	35	4,713	2,571	50	31,165
1972	2,138	12,342	10	212	212	12,290	24	246	4,863	2,213	--	34,550
1973	1,294	3,590	0	113	20	21,246	261	406	4,437	2,710	--	34,077
1974	1,857	5,621	13	865	51	19,973	92	1,125	4,990	4,747	1	39,335
1975	2,823	14,335	1	67	67	7,567	117	1,700	5,288	3,095	19	35,079
1976	1,931	2,252	0	28	5	2,285	23	1,429	6,385	4,053	30	18,421
1977	1,956	7,208	2	331	53	6,179	268	912	5,453	3,837	71	26,270
1978	1,852	9,747	9	248	113	8,492	224	3,039	3,310	2,507	31	29,572
1979[4]	2,297	3,182	11	212	12	3,102	502	3,405	2,926	2,204	11	17,864
1980[4]	1,505	2,118	21	202	88	3,589	195	3,535	5,429	3,192	513	20,387
1981[4]	1,526	1,866	54	152	97	5,373	333	2,074	2,748	3,368	200	17,791
1982[4]	689	883	126	377	87	731	209	3,746	3,747	3,713	250	14,558

1 Estimated catch is for bluefin tuna, yellowfin tuna, albacore, bigeye tuna, skipjack tuna and little tunny. Landings are for all other species. Sport catches are not included, except for bluefin tuna.

2 Includes catches of purse seiners flying the flags of Bermuda, Netherlands Antilles, Nicaragua and Panama.

3 Includes small quantities of bigeye tuna prior to 1975.

4 Preliminary.

NATIONAL REPORT ON TUNA FISHING AND RESEARCH IN URUGUAY

1. Status of the fishery

1.1 Development of the fleet

With the entry into operation of eight vessels in 1983, the national fleet which catches tunas and tuna-like fishes is now comprised of 10 longliners, whose base is the port of Montevideo.

The development of the tuna fleet has been as follows:

Year	*No. of vessels*	*Average length (m)*	*Total GRT*
1981	1	53.60	364.6
1982	1	48.83	284.6
1983	8	46.27	2,446.0
Total	10	47.26	3,095.2

1.2 The fishing grounds

During the year fishing activities were concentrated in an area around the 200 m isobath, within the Argentine-Uruguayan Common Fishing Ground. However, during most of the year fishing took place within the Uruguayan sector of this zone where better yields were observed.

The principal species taken were swordfish, bigeye, yellowfin and albacore.

Original report in Spanish.

1.3 Catches

Catches (in live weight) corresponding to 1981-83 landings by the national tuna fleet, broken down by species, were as follows:

Species	*1981*	*Metric tons* *1982*	*1983**
Albacore	27	255	410
Yellowfin	80	247	439
Bigeye	98	390	828
Swordfish	115	628	1,460
Other species	5	19	50
Total	325	1,539	3,187

*Preliminary estimates.

2. Research

Research centered on sampling of the landings of the national tuna fleet. These sampling activities started in 1983 and include measurements of predorsal length of species such as bigeye (*T. obesus*), yellowfin (*T. albacares*), and albacore (*T. alalunga*). For example, for the period October-December, 1983, 34 percent of the bigeye landings, 46 percent of the albacore landings and 15 percent of the yellowfin landings were sampled.

Studies were carried out on the CPUE of bigeye, yellowfin, albacore and swordfish, based on information extracted from fishing logbooks. On the other hand, data on the distribution of the most important species, by statistical area, are being collected and analyzed.