INTERNATIONAL COMMISSION
for the
CONSERVATION of ATLANTIC TUNAS

R E P O R T
for biennial period, 1978-79
PART II (1979)
English version

MADRID, SPAIN 1980

INTERNATIONAL COMMISSION FOR THE CONSERVATION OF ATLANTIC TUNAS

Member Countries (as of April 1, 1980)

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

Chairman of Commission

Mr. E. B. YOUNG, Canada
(to November 20, 1979)
Dr. L. KOFFI, Ivory Coast.
(from November 20, 1979)

First Vice-Chairman of Commission

Dr. L. KOFFI, Ivory Coast.
(to November 20, 1979)
Mr. H. ROSA, Brazil
(from November 20, 1979)

Second Vice-Chairman of Commission

Mr. H. ROSA, Brazil
(to November 20, 1979)
Mr. T. ISOGAI, Japan
(from November 20, 1979)

Panel Membership (as of April 1, 1980)

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

Council

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

Standing Committees

Committees:	Chairman
Committee on Finance and Administration (STACFAD)	Mr. C. J. BLONDIN, U.S.A (from November 22, 1977)
Committee on Research and Statistics (SCRS)	Mr. A. FONTENEAU, France (from November 22, 1977)

Secretariat

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

LETTER OF TRANSMITTAL

The Chairman of the International Commission for the Conservation of Atlantic Tunas presents his compliments to the Member Governments to the Convention for the Conservation of Atlantic Tunas (signed in Rio de Janeiro, May 14, 1966), and to the Delegates and Observers representing said Governments, and has the honor to transmit the ***"Report for the Biennial Period, 1978-79, Part II (1979)"***, describing the activities of the Commission during the second half of said biennial period.

The volume contains reports of the Sixth Regular Meeting of the Commission, held in November, 1979, and of all the associated meetings of the Standing Committees and Sub-Committees. In addition, it contains a summary of the activities of the Secretariat, and the National Reports on scientific activities related to tuna fisheries carried out by the various countries.

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

E. B. Young
Commission Chairman

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CHAPTER I
Secretariat Reports

ADMINISTRATIVE REPORT 1979

COM/79/13 (Amended)*

1. Member Countries of the Commission

The Food and Agriculture Organization of the United Nations (FAO) informed the Secretariat that on October 11, 1979, the Republic of Cape Verde had deposited with the Director General of FAO an instrument of adherence to the International Convention for the Conservation of Atlantic Tunas. In accordance with Article XIV, paragraph 3, of the Convention, an adherence becomes effective on the date the instrument is deposited. Therefore, as of October 11, 1979, the Republic of Cape Verde is a member of ICCAT.

The Commission is now comprised of nineteen (19) member countries.

2. ICCAT Meetings

2.1 First Special Meeting of the Commission

According to the Commission's decision in 1977, the First Special Meeting of the Commission was held in Madrid from November 15 to 21, 1978. The Proceedings of the meeting, together with reports of the SCRS, which met a week preceeding the Commission meeting, are included in the Report for the Biennial Period 1978-79 (Part I) and were presented as COM-SCRS/79/18.

2.2 Sub-Committee on Skipjack (COM-SCRS/79/22 and 24)

The Sub-Committee on Skipjack met on July 23-27, 1979, at Las Palmas, Canary Islands, Spain. The meeting was held at the "Centro de Tecnología Pesquera", at the invitation of the Excmo. Cabildo Insular de Gran Canaria. At this meeting, all activity plans were reviewed and finalized, matching contributions were studied and the budget was revised. The text of the report was forwarded to the Commissioners together with the revised budget in early September. The Executive Secretary, Assistant Executive Secretary, Skipjack Coordinator and one secretary attended the meeting.

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

2.3 SCRS Officers Meeting (COM-SCRS/79/23)

Following the decision of the SCRS at its 1978 meeting, the Officers Meeting was held at the same time and in the same place as the Sub-Committee on Skipjack Meeting. The Officers reviewed all the pending problems, progress achieved on assignments made at its 1978 meeting and preparations for the 1979 SCRS Meeting. The Secretariat was represented by the Executive Secretary and the Assistant Executive Secretary. The Report was presented as SCRS/79/23.

2.4 Bluefin Workshop (COM-SCRS/79/22 and 25)

Following the decision by the SCRS and the Commission at their 1978 meetings, the Workshop was held on September 3-8, 1979, at Santander, Spain, at the laboratory of the "Instituto Español de Oceanografía", at their invitation.

The Steering Committee and the Secretariat did all the preparatory work which is reported in the Secretariat Report on Statistics and Coordination of Research (COM-SCRS/79/22). At the meeting, a basic agreement was reached on the data base on which all bluefin stock analyses can be carried out. The Secretariat sent the Assistant Executive Secretary, the Biostatistician and a secretary.

The Report of the Workshop was presented as COM-SCRS/79/25.

2.5 Meeting of the Working Group on Juvenile Tropical Tunas (COM-SCRS/79/22 and 26)

The Group, formerly called the "Working Group on Bigeye Size Regulation", has been renamed the "Working Group on Juvenile Tropical Tunas". The Convener of the Group, (M. A. Mensah) and the SCRS Chairman (A. Fonteneau) were contacted by the FAO Committee for the East Central Atlantic Fisheries (CECAF) to hold a joint working group meeting. It was agreed that the meeting be held in Abidjan on September 17-21, 1979. The meeting was announced by CECAF to all the ICCAT Working Group members in May, but the formal invitation by ICCAT to its member countries was not sent out until August since an agreement on the terms for holding such a meeting between the ICCAT and CECAF Secretariats had not been reached earlier.

CECAF assumed responsibility for paying the trip expenses for scientists from CECAF member countries.

The meeting was held at CRO-Abidjan and basic data available were reviewed and analyzed. The Report was presented as COM-SCRS/79/26. CECAF provided a secretary for the meeting, whereas ICCAT assumed responsibility for editing, finalizing and translating the report. The Secretariat was represented by the Assistant Executive Secretary.

3. Meetings at which ICCAT was represented

a) FAO Fisheries Committee

The Executive Secretary represented ICCAT at the FAO Fisheries Committee Meeting held in Rome, October 8-12, 1979.

b) Ad Hoc Inter-Agency Consultation on Atlantic Fishery Statistics (SCRS/79/5, 17 and COM-SCRS/79/22)

The meeting of the Coordinating Working Party on Atlantic Fishery Statistics (CWP), of which ICCAT is a member, was postponed from 1979 to 1980. Instead, an Ad Hoc Inter-Agency Meeting was called by the CWP Secretary (FAO) in Warsaw, Poland, on September 21 and 22, 1979. The meeting was held in conjunction with the meeting of the International Council for Exploration of the Sea (ICES). ICCAT was represented by the Assistant Executive Secretary. The Report of the meeting was presented as SCRS/79/5 and the proposals to ICCAT scientists derived from this meeting were presented as SCRS/79/17.

The ICCAT, jointly with ICSEAF, plans to host the next CWP Meeting which is now scheduled for late July, 1980, in Madrid.

c) International Council for the Exploration of the Sea (ICES)

ICES held its 67th Statutory Meeting in Warsaw, Poland, on October 1-10, 1979. As the FAO Inter-Agency Statistical Meeting was held in conjunction with this meeting, the Assistant Executive Secretary attended the earlier scientific sessions of the ICES Meeting. He reported to the Pelagic Fish Committee of ICES on recent ICCAT developments regarding bluefin tuna studies and requested the cooperation of the ICES Bluefin Working Group. Previous agreements on cooperation and exchange of results of bluefin studies were reaffirmed by ICES.

d) Tuna Consultation Meeting in Manila

At the invitation of UNDP and FAO (trip expenses paid by UNDP), the Assistant Executive Secretary attended the Tuna Consultation Meeting in Manila, Philippines, June 26-30, 1979. Prior to this meeting, he also attended the Tuna Stock Assessment Workshop held at Shimizu, Japan. The Shimizu meeting evaluated the present status of stock assessment work for the major tuna species and billfishes in the Pacific and Indian Oceans. At the Manila meeting, Dr. Miyake presented a written report summarizing all the statistical activities and describing the ICCAT data management system. As tuna statistics problems in the Indian and west Pacific Oceans are very similar to those in the Atlantic Ocean where ICCAT start the activities, Dr. Miyake's experience contributed much to the meeting.

4. Cooperation with other organizations

a) FAO

As in the past, close working cooperation has been maintained with the FAO Fisheries Department. Mutual assistance in collecting statistics is maintained. FAO staff, particularly Drs. J. A. Gulland and G. Sharp, made valuable contributions at various SCRS meetings, as well as during the inter-sessional period on various subjects. Particularly this year since the legal aspects regarding the interpretation of the Con-

vention were questioned, Dr. J. E. Carroz's advice to the Commission was appreciated.

b) Other organizations

The other organizations with which ICCAT has maintained close working relationships include the Inter-American Tropical Tuna Commission (IATTC), the International Commission for the Southeast Atlantic Fisheries (ICSEAF), the Indo-Pacific Fisheries Council (IPFC), the Indian Ocean Fisheries Commission (IOFC), the International Council for the Exploration of the Sea (ICES) and the Northwest Atlantic Fisheries Organization (NAFO).

As mentioned in previous sections of this report, the meeting of the Working Group on Juvenile Tropical Tunas was held jointly with CECAF. Again, as already reported, cooperation with ICES regarding bluefin was reaffirmed. This was one of the recommendations made by the Bluefin Workshop.

5. Coordination of Research

The coordination of research carried out by the Secretariat during 1979 was summarized in the "Secretariat Report on Statistics and Coordination of Research" (included in Chapter I of this Biennial Report) and reported in detail in various other documents (SCRS/79/13 to 26).

In 1979, the work was increased sharply as many new assignments were given to the Secretariat and three unforeseen intersessional meetings were held. The Secretariat was not only engaged in physical preparations and organization of the meetings, but also engaged in processing basic data for use by the scientists at these meetings. The latter involved much input work, verification and summarization of the data and making those data available to other scientists.

The funds allocated to the Secretariat did not take into account these new assignments. Besides, much of the monetary value was lost, due to inflation, and execution of all the urgent work was completed only through careful planning, sacrificing some of the less important work and by overworking the Secretariat staff members.

Besides those activities already mentioned in relation to the meetings, etc., the following activities warrrant special mention:

a) Data Bank

The data bank established with the INFONET system in 1977 in Madrid has been maintained, updated and utilized for all the statistical work executed by the Secretariat. The accumulation of experience in using the system and more completeness of the data base and programs have reduced the operating cost.

The amount of work achieved during 1979 by the data system was more than double that of 1978, whereas the only increase in expenditure for the computer system was that due to inflation.

b) Skipjack Coordination

As the four-year International Skipjack Year Program started in 1979, much of the coordination work was done by the Secretariat. Details can be reviewed through various reports. The following activities are highlighted:

1. Recruitment of the Skipjack Coordinator
2. Inquiry of legal procedure necessary for research boats and aircraft to operate in coastal jurisdictional waters
3. Organization of the Sub-Committee on Skipjack meeting
4. Supplementing, editing and integrating all activity plans

c) Preparation for the Bluefin Workshop

1. Assembly of data which were not available before
2. Preparation of a compendium of the description of all existing fisheries
3. Creation of the bluefin data base
4. Creation of the bluefin tagging file

d) Preparation for the Working Group on Juvenile Tropical Tunas Meeting

The Secretariat prepared all catch, catch and effort and biological data, with the exception of FISM data, for use by scientists attending this meeting.

6. Publications

a) Biennial Report

Part I of the Biennial Report for the biennial period 1978-79 was printed in the three official languages of the Commission and distributed in October.

At the 1978 Commission meeting, the Secretariat proposed to purchase a composer in order to cut down the rapidly increasing printing costs and the proposal was approved by the Commission.

The IBM MC Composer was purchased in December, 1978, and the entire Biennial Report was composed at the Secretariat. As this was the first year and the staff members had to learn to operate the new machine, some delay was experienced in page setting. Besides, the text of the Proceedings was not finalized until August, 1979, due to the conflicting opinions regarding the interpretation of the Convention on voting procedure. This caused some delay in publishing the Biennial Report this year. However, the use of the composer eliminated the repeated proof-readings of the galley proofs, and, above all, represented about $10,000 savings in printing costs for 1979.

The masters, thus composed at the Secretariat, were sent to the printer for photo

offset printing.

In the future, as the staff becomes more experienced, less time will be needed to set the pages at the Secretariat and earlier issue of the Biennial Report will be possible.

b) Scientific publications

Title	*Volumes*	*Issued in*	*Remarks*
Statistical Bulletin	7 (1977) Final	Jan. 1979	
Statistical Bulletin	8 (1978) 1st Ed.	Aug. 1979	
Collective Volume	8 (1 & 2)	Mar. 1979	1978 SCRS papers
Field Manual	French & Spanish	Oct. 1979	English issued in 78
Data Record	Vol. 12	Mar. 1979	Data received Feb. 78-Feb. 79
Data Record	Vol. 13	Jun. 1979	Nov. 78-Feb. 79
Data Record	Vol. 14	Oct. 1979	Mar. 79-Sept. 79
Statistical Series	Vol. 7	Oct. 1979	ICCAT port sampling
Statistical Series	Vol. 8	Oct. 1979	Tema-based data
Newsletter	3 issues in 1979		

7. Secretariat and administration

a) Staff

Dr. Philip E. K. Symons (Canadian nationality) was hired as Skipjack Coordinator and started working on May 1, 1979.

b) Trips by the staff

Besides the trips which various Secretariat staff members took to attend meetings (see Meetings section of this report), the following trips were made by the staff:

The Biostatistician visited Yugoslavia, Tunisia and various Mediterranean coastal ports along southern France and Spain during May-July, 1979, in order to get data on bluefin tuna and its fisheries.

In October, 1979, the Skipjack Coordinator travelled to Senegal and visited French baitboats in Dakar to obtain a first hand impression of the skipjack fishery.

The Assistant Executive Secretary made a very quick trip in March, 1979, to North America to interview several candidates for the Skipjack Coordinator position.

c) Office space for the ICCAT Secretariat Headquarters

In 1978, the Commission recommended that new ample office space be sought for the Commission's Headquarters. Continuous contacts were made with various administrative departments of the host government (Spain). In the early part of this year, the Spanish Government authorized larger office space for the Seat of the Commission.

The Secretariat started looking for new space. However, there has been some administrative difficulty in having the contract made quickly. Since the office space was oversaturated with staff and since floor space became available in the same building where the office is presently located, the Secretariat decided to solve this problem temporarily by renting the extra space.The Statistical Department moved to the 3rd floor of the same address in September. Therefore, this is only a temporary solution and we are still seeking a permanent solution for office space. The Spanish Under-Secretary of Fisheries has recently informed us that the financial matter has been solved and that the Spanish Government offered to solve the problem immediately.

O. Rodríguez-Martín
Executive Secretary

FINANCIAL REPORT 1979

COM/79/14 (Amended)*

I. REGULAR COMMISSION BUDGET

1. Auditor's Report of Fiscal Year 1978

The Auditor designated by the "Instituto de Censores de Cuentas de España" has examined the accounts and balance sheet of the Commission up to December 31, 1978. In compliance with Regulations 9-3 and 12-7 of the Financial Regulations and in accordance with the recommendation of the Council at its Second Regular Meeting, the Secretariat sent a copy of the Auditor's Report to all member country governments in June, 1979. An abstract of the same has been included in the Biennial Report, 1978-79, Part I, which was presented as a document of this Commission (COM/79/18).

2. 1979 Budget

It should be recalled that the Estimated Budget presented by the Secretariat for 1979 (COM/77/17) was for $467,000 USA, but was reduced by the Commission to $429,000 USA, that is, a reduction of $38,000.

Expenses during 1979 increased considerably for several reasons:

a) There was an increase in the work load of the Secretariat due to the increase in activities, and which necessitated the hiring of temporary personnel.

b) During 1979, three inter-sessional scientific meetings were held that were not foreseen in the budget, and which resulted in substantial expenses for the preparation of documents and reports (translation, typing, reproduction and distribution), attendance of part of the Secretariat staff, and considerable extra correspondence. Reference is made to the following:

i) Meeting of the Sub-Committee on Skipjack - Las Palmas, Canary Islands, July 23-27, 1979.
ii) Bluefin Workshop - Santander, September 3-8, 1979.
iii) CECAF/ICCAT Joint Working Group Meeting on Juvenile Tropical Tunas - Abidjan, September 17-22, 1979.

c) Contracts for new ICCAT port samplers (Cape Town) to compile and improve statistical information.

*Updated to the end of Fiscal Year 1979. Modifications approved by the Commission have been introduced.

On the other hand, the expenses of the Secretariat were affected, logically, by economic and financial problems of the country where the Seat is located. Spain experienced an inflation rate of 16 percent in 1978 and a similar figure for 1979. The devaluation of the US dollar, with respect to the peseta, has reached 24 percent in these two years.

The Commission Budget is in US dollars, but a major part of the expenses are incurred in pesetas, including the salaries of some of the staff. The salaries for the regular staff are paid in dollars and are also affected by the devaluation of the dollar, so that the FAO updates them by means of a post-adjustment for each country, in accordance with the fluctuation of the local monetary exchange rate and the dollar.

For all the aforementioned reasons, this year, for the first time, we are ending the financial year with a negative balance.

3. Current status of Commission accounts

Statement 1 shows the financial situation at the end of Fiscal Year 1978. The state of accounts showed a balance of $62,402.90.

There were contributions pending payment totaling $11,711.95 as of the end of 1978.

Statement 2 shows the status of each member country's contribution. There are 1979 contributions pending from Gabon, Ghana and Senegal, and payments pending from other years corresponding to Ivory Coast ($7,826.38). In summary, a total of $40,392.94 is pending payment to the Commission to cover the 1979 Regular Budget.

Statement 3 shows the budget and expenditures incurred and paid up to the end of the fiscal year, which shows a negative balance of $23,211.53. The Commission decided that this amount would be covered by the Working Capital Fund.

4. General comments (Statement 3)

Chapter 1 - SALARIES

The "Salaries" Chapter shows a substantial negative balance due to the increase in salaries and to the incorporation of additional personnel at the Secretariat.

Chapter 2 - TRAVEL

See the Administrative Report (COM/79/13) for further details on trips made by the Secretariat staff.

Chapter 3 - MEETINGS

The actual expenses for this chapter surpassed considerably the budget allocated to it, as can be seen in the following table of expenses:

i) Simultaneous translators	$10,829.04
ii) Extra staff	9,530.56
a) 4 multilingual translators b) 1 receptionist c) 1 assistant receptionist d) 1 multi-copy machine operator e) 1 assistant operator	
iii) Secretariat	6,004.94
a) Overtime (G category) b) Transportation and meals during meeting and during transport of equipment to the hotel and back after the meeting	
iv) Hotel - various conference rooms	6,654.30
v) Cafeteria - Coffee break	3,000.00
vi) Cymen Company (electronic equipment)	5,090.90
vii) 3 Rank Xerox copiers (Models 7000, 4500 and 3100) and materials	6,807.40
viii) Office equipment and rentals	1,179.25
TOTAL	$49,096.39

Chapter 4 - PUBLICATIONS

The preparation of the following publications has been charged to this chapter:

a) Biennial Report, 1978-79, Part I (English, French and Spanish)
b) Statistical Bulletin, Vol. 8 (1977) Final edition
c) Statistical Bulletin, Vol. 9 (1978) Preliminary edition
d) Collective Volume, Vol. VIII (1) and (2)
e) Data Record, Vols. 12, 13 and 14
f) Statistical Series, Nos. 7 and 8
g) Proceedings of the First Special Meeting of the Commission
h) Newsletter
i) Field Manual (French and Spanish versions)

In order to reduce, in part, the tremendous increase in the publication costs, the Commission authorized the Secretariat at its last meeting to purchase an IBM MC Composer. Funds from the positive balance of Fiscal Year 1978 were used to purchase the Composer, whose total cost was $22,168.20. (See the Financial Report COM/78/23 (amended).) Results confirm the wisdom of our decision to buy the new machine. Here below is shown a breakdown of the costs for the Biennial Report (in the three official languages of the Commission) for the last two years:

a) Printing process used in previous years:

Actual cost in 1978	$19,345
Estimated cost for 1979 (15 percent increase)	22,246

b) Using the IBM Composer method:

Actual cost in 1979	$12,923

As you can see by the above figures, there was a 42 percent savings in the actual cost, or $9,323, and this substantial savings refers to only one Commission publication.

Chapter 5 - OFFICE EQUIPMENT

We are charging to this budget chapter the purchase of furniture for the additional Secretariat office space. Also charged to this chapter is the furniture purchased for the Skipjack Coordinator.

Chapter 6 - OPERATING EXPENSES

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

-- Telephone	$ 5,690
-- Telegraph and Telex expenses	2,100
-- Mailing expenses	8,200
-- Office cleaning	1,800
-- Electricity	1,200
-- Duplication of documents (Xerox)	10,000
-- Office material	6,600
-- Security bond	1,400
-- Auditor's expenses	1,000
-- Office rent (3rd floor)	2,500
-- Office painting (3rd floor)	2,000
-- Miscellaneous expenses	1,637
TOTAL	$44,127

Chapter 7 - MISCELLANEOUS

This chapter includes minor expenses, such as repairs (plumbing, painting, furniture repairs, etc.), local transportation for office business and general expenses which are not

applicable to the other budget chapters.

Chapter 8 - COORDINATION OF RESEARCH

The expenses, broken down by sub-chapter, are as follows:

Sub-chapter	*I Budget*	*II Expenses*
a) Staff	88,000	91,046.46
b) Travel	11,000	6,029.19
c) Equipment	5,000	2,017.25
d) Data processing	25,000	20,195.20
e) Miscellaneous	5,000	46.29
TOTAL	134,000	119,334.39

Staff – This sub-chapter includes M. Laurent (Biostatistician), V. Nordström (systems analyst), A. Rick and M. J. Trapero (temporary statistical aids) - $80,137.07. (It also includes the expenses of the ICCAT port samplers in Tenerife, Las Palmas, St. Maarten and Cape Town - $10,909.39.)

Travel – Trips made by the Biostatistician to the Mediterrean area (France, Tunisia and Yugoslavia) are included in this sub-chapter, as well as the Biostatistician's travel expenses to attend the Bluefin Workshop in Santander, Spain.

Equipment – The expenses of this sub-chapter correspond to statistical materials.

Data processing – Although the data processing work has doubled, the cost attributed to this sub-chapter has remained similar to that of last year. This is due to the growing experience of the staff which has allowed for better utilization and increased yield of the equipment. It should be noted, however, that the data processing costs cover an eleven-month period (February-December).

II. SPECIAL SKIPJACK BUDGET

1. 1979-82 Budget (Statement 4)

The Special Skipjack Budget for 1979-82 was approved by the Commission at its First Special Meeting (Madrid, November 1978). The Budgets were included in the Biennial Report, 1978-79. Part I (Appendix 5 to Annex 5). 1979 was the first year of the Program.

In this budget no amounts were included for "Activities" during 1979, but were limited to the "Coordination Services" of the Program. These services totaled $42,000 for

the Fiscal Year 1979.

2. Country contributions to the Special Skipjack Budget (Statement 5)

Statement 5 shows the status of the member country contributions. 1979 skipjack contributions are still pending payment for some member countries and this outstanding amount totals $1,863.00.*

3. Special Skipjack Budget (Statement 6)

Statement 6 shows the Special Skipjack Budget and the expenses incurred and paid up to the end of the Fiscal Year 1979, and ends with a negative balance of $3,068.17, which will be charged to the Working Capital Fund.

Salaries – The salaries of the following staff members are included in this sub-chapter: P.E.K. Symons (Skipjack Coordinator) - since April ($25,910.00), G. Stephens (Secretary) - since September ($4,730.95) and some occasional part-time help.

Office equipment and material – Expenses pertaining to this sub-chapter have been charged to Chapter 5 of the Regular Commission Budget - "Office Equipment."

Travel – Included in this sub-chapter are the travel expenses to North America for the Secretariat to interview the Skipjack Coordinator candidates, the travel expenses of the Skipjack Coordinator and his family to Madrid, as well as those expenses incurred by the Coordinator to attend the meeting of the Sub-Committee on Skipjack (Las Palmas) and a trip to Dakar to observe port activities.

Operating expenses and contracts – Moving expenses for the personal effects of the Skipjack Coordinator from Vancouver, British Columbia, Canada, to Madrid ($7,558.08) have been charged to this sub-chapter. The prize for the skipjack logo contest ($501.56) was also charged to this sub-chapter.

III. OTHER BUDGET STATEMENTS

1. Income and Expenditures of the two Budgets (Statement 7)

Statement 7 shows a total income and expenditures during 1979, corresponding to both the Regular Commission Budget and the Special Skipjack Budget.

2. Balance Sheet (Statement 8)

Statement 8 presents the Balance Sheet up to the end of Fiscal Year 1979.

* Fortunately, one member country has paid its 1980 skipjack contribution in advance.

3. Breakdown of Working Capital Fund (Statement 9)

Statement 9 gives the status of the Working Capital Fund. The Fund had $63,441.59 at the end of Fiscal Year 1978. By adding the non-budgeted income corresponding to 1979, the total amount in the Fund increases to $77,561.96. By charging the total ($26,280.70) of the negative balances from both budgets of this Fund, plus $1.00 to round off the 1979 Regular Budget, the Fund shows a balance of $51,281.28 at the end of the 1979 Fiscal Year. This Fund is very useful as it serves to cover the possibility of delays in payment of the contributions as well as to meet Commission expenses during the early months of the year until the early country contributions are received.

4. Auditor's Report for Fiscal Year 1979 (Statement 10)

The Balance Sheet at the close of Fiscal Year 1979 has been extracted from the Auditor's Report (for 1979) and is given as *Statement 10.*

STATEMENT 1

Statement at Close of Fiscal Year 1978

ASSETS			*LIABILITIES*	
		$		$
1. Banco Exterior de España			1. Status of Working Capital Fund	63,441.59
a) Time deposit account		30,000.00	2. Tagging Fund	1,998.46
b) Checking account		35,853.03	3. In favor of: Cuba	80.16
c) c/a domestic Ptas.	367,475.48		Senegal	1,313.00
d) c/a convert. Ptas.	42,468.69		Spain	2,781.64
2. Cash on hand Ptas.	88,089.06		4. Field Manual (2nd Ed.) (French & Spanish)	4,500.00
Ptas.	498,033.23	7,217.87		
(1 US $ - 69 Ptas.)		73,070.90		
3. Angola contribution, included in Fiscal Year 1979		10,668.00		
		62,402.90		
4. Contributions pending payment		11,711.95		
TOTAL		74,114.85		74,114.85

Statement of Member Country Contributions in 1979*

Country	*1978 Balance*	*Contributions for 1979 Budget, approved by the Commission*	*Contributions paid for the 1979 Budget*	*Other Contributions*	*1979 Balance*
Angola	--	10,668	10,668.00 (2/XI/78)	--	--
Brazil	--	10,400	10,400.00 (17/VIII)	813**	+ 813.00
Canada	--	13,359	13,359.00 (13/II)	--	--
Cuba	+ 80.16	15,928	15,829.85 (25/III/80)	--	- 17.99
France	--	63,759	63,759.00 (24/III)	--	--
Gabon	- 2,958.00	3,200	--	--	- 6,178.00
Ghana	- 927.57	14,257	--	--	-15,184.57
Ivory Coast	- 7,826.38	14,408	14,408.00 (15/II/80)	--	- 7,826.38
Japan	--	40,576	40,576.00 (21/IV)	--	--
Korea	--	43,168	43,168.00 (27/III)	--	--
Morocco	--	13,027	13,027.00 (10/X)	--	--
Portugal	--	21,280	21,800.00 (15/XII)	--	--
Senegal***	+ 258.00	11,444	--	--	-11,186.00
South Africa	--	6,609	6,609.00 (18/I)	--	--
Spain	+ 2,781.64	77,091	77,091.00 (10/X)	--	+ 2,781.64
United States	--	47,792	47,792.00 (31/I)	--	--
U.S.S.R.	--	22,013	22,013.00 (31/III)	--	--
	+ 3,119.80	429,000	339,979.85	813	+ 3,594.64
	- 11,711.95	(428,999)			-40,392.94

* Contributions corresponding to Benin and Cape Verde were not budgeted for 1979. They should appear as extra-budgetary income.

** Overpayment of 1979 contribution.

*** Of the positive balance of $1,313, $1,055 was applied to the 1979 Special Skipjack Budget, leaving a current balance in Senegal's favor of $258.

STATEMENT 3

Fiscal Year 1979, Budget, Expenditures and Balance ($)

	I	*II*	*III*
	1979 Budget	*Total expenditures Fiscal Year 1979*	*Balance*
1. Salaries	172,000	193,098.80	- 21,098.80
2. Travel	12,000	11,449.24	+ 550.76
3. Meetings	43,000	49,096.39	- 6,096.39
4. Publications	22,000	22,993.97	- 993.97
5. Office Equipment	4,000	3,909.10	+ 90.90
6. Operating Expenses	38,000	44,127.67	- 6,127.67
7. Miscellaneous	4,000	4,464.17	- 464.17
8. Coordination of Research	134,000	119,334.39	+ 14,665.61
9. Contingencies	0	------	------
	429,000	448,473.73	- 34,781.00
			+ 15,307.27
			- 19,473.73
Reserved from 1978 Budget*	4,500	8,237.80	- 3,737.80
TOTAL	433,500	456,711.53	- 23,211.53

* Applied to the publication of the Field Manual (French and Spanish versions).

STATEMENT 4

Modified Budget for the International Skipjack Year Program (USA $)

	1979	*1980*	*1981*	*1982*	*Total*
Activities					
Tagging with dart tags	0	60,000	15,000	10,000	85,000
Port Sampling	0	5,000	35,000	5,000	45,000
Intensive Sampling	0	30,000	10,000	5,000	45,000
Genetics*	0	8,000	2,000	0	10,000
Sub-totals	0	103,000	62,000	20,000	185,000
ICCAT Coordination Services					
Salaries	30,000	38,000	43,000	43,000	154,000
Office equipment and materials	0	2,000	5,000	5,000	12,000
Trip expenses	5,000	5,000	10,000	5,000	25,000
Operational expenses and contracts	7,000	12,000	15,000	15,000	49,000
Sub-totals	42,000	57,000	73,000	68,000	240,000
TOTAL	42,000	160,000	135,000	88,000	425,000

* Presently referred to as "Biochemical Stock Identification."

STATEMENT 5

Special Skipjack Budget - Statement of Member Country Contributions in 1979 (USA $)

Country	*Contributions for 1979, (approved by the Commission)*	*Contributions Paid for 1979*	*Other Contributions*	*1979 Balance*
Angola	850	850	--	--
Benin	246	--	--	- 246
Brazil	820	820	--	--
Canada	1,036	1,036	--	--
Cuba	1,443	1,443	--	--
France	6,828	6,828	--	--
Gabon	246	--	--	- 246
Ghana	1,371	--	--	- 1,371
Ivory Coast	1,388	1,388	--	--
Japan	3,984	3,984	--	--
Korea	4,276	4,276	--	--
Morocco	1,116	1,116	--	--
Portugal	1,928	1,928	--	--
Senegal	1,055	1,055*	--	--
South Africa	510	510	--	--
Spain	8,212	8,212	--	--
U.S.A.	4,797	4,797	18,272**	+ 18,272
U.S.S.R.	1,894	1,894	--	--
TOTAL	42,000	40,137	18,272	- 1,863
		(39,082)		+ 18,272

* Part of the positive balance of the 1978 fiscal year was applied as a contribution to this Special Skipjack Budget (See Statement 2 of the Financial Report - 1979 Regular Budget).

** Advance from the U.S.A. for the 1980 Skipjack Budget.

STATEMENT 6

Special Skipjack Budget (USA $)

	I	*II*	*III*
	1979 Budget	*Total Expenditures*	*Balance*
ACTIVITIES			
Dart Tagging	0		
Port Sampling	0		
Intensive Sampling	0		
Genetics*	0		
Subtotal	0		
COORDINATION SERVICES - ICCAT			
Salaries	30,000	30,640.95	- 640.95
Office equipment and material	0	--	--
Travel	5,000	6,367.58	- 1,367.58
Operating expenses and contracts	7,000	8,059.64	- 1,059.64
Subtotal	42,000		
TOTAL	42,000	45,068.17	- 3,068.17

* Now referred to as "Biochemical Stock Identification."

STATEMENT 7

Regular Commission Budget and Special Skipjack Budget

INCOME		*DISBURSEMENTS*	
	$		$
Cash and Bank at end of Fiscal Year 1978	62,402.90	From 1979 Regular Budget	456,711.53
Income corresponding to 1979 Regular Budget	399,979.85	From 1979 Special Skipjack Budget	45,068.17
Income corresponding to 1979 Special Skipjack Budget	39,082.00	Total Disbursements	501,779.70
Other Contributions to Regular Budget (Brazil)	813.00	Balance in Cash and Bank at the close of Fiscal Year	32,890.42
Bank interest	7,698.22		
1978 Extrabudgetary contribution from Benin	3,103.48		
1979 Extrabudgetary contribution from Benin	3,220.00		
Advance 1980 contribution to Special Skipjack Budget (U.S.A.)	18,272.00		
Differences in currency exchange rates	98.67		
TOTAL	534,670.12	TOTAL	534,670.12

STATEMENT 8

Balance Sheet at Close of Fiscal Year 1979

ASSETS			*LIABILITIES*	
		$		$
1. Banco Exterior de España			1. Status of Working Capital Fund	77,561.96
a) Checking account		30,125.69		
b) Domestic Ptas.	144,217.89		2. Tagging Fund	1,998.46
c) Convert. Ptas.	17,395.69		3. In favor of: Brazil	813.00
			Spain (1978)	2,781.64
2. Cash on hand - Ptas.	50,859.00		USA (Special Skipjack Budget - 1980)	18,272.00
(1 US $ = 66 Ptas.)	182,472.58	= 2,764.73		
		32,890.42		
3. Pending Contributions				
a) Regular Budget		40,392.94		
b) Special Skipjack Budget		1,863.00		
4. Negative Balance				
a) Regular Budget		23,211.53		
b) Special Skipjack Budget		3,068.17		
5. Rounding off addition of contributions		1.00		
TOTAL		101,427.06	TOTAL	101,427.06

STATEMENT 9

Breakdown of the Working Capital Fund

At the end of Fiscal Year 1978		$63,441.59
1978 Extrabudgetary contribution from Benin		3,103.48
1979 Extrabudgetary contribution from Benin		3,220.00
Bank Interest		7,698.22
Differences in currency exchange rates		98.67
		77,561.96
Applied to this Fund to cover the negative balance:		
a) From the Regular Budget	$23,211.53	
b) From Special Skipjack Budget	3,068.17	
– Rounding off of Regular Budget	1.00	
	26,280.70	26,280.70
TOTAL		51,281.26

International Commission for the Conservation of Atlantic Tunas - Balance Sheet at Close of Fiscal Year 1979

ASSETS			*LIABILITIES*		
Available:			*Acquired holdings:*		
BANCO EXTERIOR DE ESPAÑA			From previous fiscal years	$62,345.02	
C/A 30-31279-Q		$30,125.69	During Fiscal Year 1979	4,012.56	$66,357.58
C/A 30-17329-F (convert. ptas.)	17,395.69				
C/A 30-17672-A (in ptas.)	114,217.89				
Cash on hand ptas.	50,859.00				
total ptas.	182,472.58				
(At 66 ptas. per $1)		2,764.73	*Working Capital Fund:*		
		$32,890.42	As shown in attachment		$51,281.26
Receivables:					
a) Regular Commission Budget			Tagging Fund		$1,998.46
Cuba	$ 17.99				
Gabon	6,178.00		*Income received in advance:*		
Ghana	15,184.57		Brazil	$ 813.00	
Ivory Coast	7,826.38		Spain	2,781.64	
Senegal	11,186.00	$40,392.94	U.S. (from SJ Budget)	18,272.00	$21,866.64
b) Special Skipjack Budget:					
Benin	$ 246.00				
Gabon	246.00				
Ghana	1,371.00	$ 1,863.00			
Equipment:					
Before 1979	$62,075.82				
During 1979	4,012.56	$66,088.38			
Bonds:		269.20			
TOTAL ASSETS		$141,503.94	TOTAL LIABILITIES		$141,503.94
Furniture ceded by Undersecretariat of Merchant Marine of Spain		$ 3,365.38	Furniture ceded by Undersecretariat of Merchant Marine of Spain		$ 3,365.38

Madrid, June 10, 1980

The Executive Secretary:
O. Rodríguez-Martín

Certified:
A. Oliver y Trujillo

SECRETARIAT REPORT ON STATISTICS AND COORDINATION OF RESEARCH

COM-SCRS/79/22 (Amended)

I. Statistics and sampling

1. Collection of 1978 statistics through the national offices

The same routine procedure was adopted as has been used in previous years. Various reminders and requests were forwarded by letter, telephone and telegram to those countries which failed to provide the Commission with statistics. The progress made by the national offices and by the Secretariat is shown in Tables 1, 2 and 3 (now contained in Appendix 4 to Annex 7 of the Proceedings) for Task I, Task II - catch and effort and biological statistics, respectively.

a) Task I - nominal annual catch statistics (Table 1)

In 1979, the reporting of Task I statistics was considerably behind schedule. At the end of August, when the first edition of the Statistical Bulletin was compiled, a major tuna fishing country (Spain) still had not reported its catches. Unfortunately, the first edition of the Statistical Bulletin was prepared without those statistics since we could not delay the preparation of the Bulletin any longer.

The Secretariat tried, however, to obtain the missing data and a second processing of Task I data was done in October. The results of the second compilation were not published as a separate Statistical Bulletin, but were distributed to the SCRS species rapporteurs for inclusion in their analyses.

b) Task II - catch and effort statistics (Table 2)

Some improvements were made by various national offices but as of the date of writing of this report, the data for the two major tropical surface fleets (Spain and FISM) were not yet made available.

The Secretariat extracted catch and effort information for the Tema-based baitboat fleet from the biological sampling sheets sent to the ICCAT Headquarters by the scientists of the Fisheries Research Unit of Ghana. The sheets were originally prepared for reporting measurements of fish. The Task II data, though less precise than those extracted from logbooks, were then included in Statistical Series-8, together with biological data.

c) Task II - biological data (Table 3)

A major improvement made during 1979 was that size frequencies for tunas caught by the U.S.S.R. fleets became available for the first time. The data covers the years 1965 through 1978. A major problem with the biological statistics (as of the time of this report) was that the data for the FISM and Spanish tropical fleets were not yet made available.

2. Collection of 1979 catch estimates (Table 4)

Progress is shown in Table 4 (now included in Appendix 4 to Annex 7 to the Proceedings). The estimates reported to the Secretariat and the data which have been collected at the ports by the Secretariat were made available to the scientists in early October.

3. Port sampling by the Secretariat

The Secretariat's efforts to collect logbook records and size frequencies at Atlantic transshipping ports from longliners have been continued during 1979. At Las Palmas, Tenerife, St. Maarten and Cape Town one local person has been employed by the Secretariat as a part-time coordinator. Up to early 1979, sampling at Cape Town was carried out by the Sea Fisheries Department of South Africa, under special contract with ICCAT. However, the increasing work load at the Department made it impossible for them to continue such a scheme. A person is now working, on the ICCAT payroll, at Cape Town but is still supervised by the Sea Fisheries Department. Abidjan has been dropped from the sampling program as longliners are no longer transshipping at that port. On the other hand, transshipments in Venezuela and Uruguay have been increasing. If this program is to be continued in 1980, reorganization must be done to include the ports of Cumaná (Venezuela) and Montevideo (Uruguay).

4. Secretariat's evaluation of the present data coverage (Table 5)

Table 5 summarizes the Secretariat's view on the adequacy of the data coverage, based on sections 1-3 of this report and on the ICCAT data bases. The rating 1 (adequate), 2 (partially covered), and 3 (not covered) has been made arbitrarily.

The table does not include bluefin data as a detailed evaluation of data was presented in the Report of the Bluefin Workshop (Santander, September 1979) (COM-SCRS/79/25).

II. Data processing (ICCAT data bank)

1. Facilities

The INFONET system was contracted again in 1979 for ICCAT data management. Details can be found in the Administrative Report.

2. Data processing

Much more work was carried out in 1979 using the data management system. Besides disseminating data which were received at the Secretariat, for the first time in 1979, the Secretariat provided various Working Groups with a lot of data processed by the Secretariat.

Following is a list of the major work done in 1979 (see SCRS/79/13 for details):

a) Updating all the data bases (Task I, catch and effort and biological).

b) Data entry and processing of Tema-based statistics (Statistical Series-8).

c) Data entry and processing of port sampling statistics (Statistical Series-7).

d) Processing of detailed past catch and effort and size frequency statistics for the Working Group on Juvenile Tropical Tunas.

e) Output of newly received data in a uniform format (Data Record, Vols. 12, 13 and 14).

f) Compilation of Task I data (Statistical Bulletin, Vol. 9 and species catch tables).

g) Compilation of bluefin statistics for the Bluefin Workshop.

h) Creation of tagging files for the entire Atlantic.

i) Compilation of yellowfin statistics by East-West Atlantic (SCRS/79/14) and albacore statistics by North-South Atlantic (SCRS/79/15).

3. Dissemination of information and publications

a) Quick estimates

April, 1979 – for estimates of all of 1978.

October, 1979 – for estimates of first half of 1979.

b) Statistical Bulletin

January, 1979 – final 1977 version - published

September, 1979 – first edition of 1978 - published

October, 1979 – second edition of 1978 - not published

c) Data Record

Volume	When published	Data received on:
12	March, 1979	February-October, 1978
13	June, 1979	Nov., 1979 – Feb., 1979
14	October, 1979	March, 1979-September, 1979

Volume 12 was delayed since late 1978 because the Secretariat waited until the new format for the Data Record, proposed by the Secretariat, was approved at the 1978 SCRS meeting. As the new format was adopted, preparation and publication of the data

was done in early 1979 in the new format. Volume 13 was prepared immediately after Volume 12 was issued. In the new formatted Data Records, catch and effort data are presented in 1 x 1/5 x 5 and by month/quarter, and in ICCAT sampling area by quarter. Size frequencies are presented by ICCAT sampling area and by month or quarter. No data substitution nor raising (weighting by catch) was done by the Secretariat.

Each volume includes data catalogues for the ICCAT files and indicates where the outputs are published.

d) Collective Volume of Scientific Papers

Volume 8 (nos. 1 and 2) which contains 1978 SCRS documents, was published in March, 1979.

e) Statistical Series

Volume 7, published in October, 1979, includes 1978 ICCAT port sampling results.

Volume 8, published in October, 1979, includes Ghana-based baitboat data.

The data processing for these series was completed by the end of August. However, there was considerable delay in issuing them, due to the heavy work load.

In Statistical Series-8, for the first time, the Secretariat extracted catch and effort data from field sampling sheets sent by the Fishery Research Unit of Ghana and made up a table of Task II statistics. They were not logbook abstracts but the Secretariat hopes that these data serve as a substitute for Task II data. (In the Working Group on Juvenile Tropical Tunas, they were indeed used and it was recommended that the program be extended to previous years.)

f) Field Manual

The English version was completed in 1978 and the Spanish and French versions were issued in October, 1979.

4. Working Group on Data Management

This Working Group was established during the 1978 SCRS Session. The Group requested the Secretariat to circulate a questionnaire to each national correspondent to help determine the long- and short-term data processing to be performed by the Secretariat. The questionnaire concerned the expected level and volume of data input from the national offices to the Secretariat data base and what level of processing, as well as types of output the national offices request from the Secretariat. Eleven countries responded to the questionnaire and the Secretariat summarized and circulated the responses among the pertinent scientists. Based on these results, the Working Group initiated its studies.

Dr. J. R. Pascual (Spain) was nominated originally as the Convener of the Group, but he declined it as his other duties conflicted with such work. Mr. R. H. Pianet

(France) is now the Convener.

The Secretariat is awaiting the conclusions of the Working Group concerning the need, level and volume of processing required of the ICCAT data management system by the national scientists. As soon as this is defined, the Secretariat intends to conduct cost-effective studies to carry out such processing work.

III. Tagging Program

No tagging cruise was organized by the Secretariat this year. However, many tags and materials were provided to Spain and to Brazil to facilitate their tagging operations. The ICCAT stock of tags had run out but 2000 polyurethane tags were received from the Japanese Government as their contribution to the young bluefin tagging program.

This year's tagging lottery was held on July 24, 1979, at the opening session of the meeting of the Sub-Committee on Skipjack in Las Palmas. Two three-hundred dollar prizes were each awarded to a U.S. skipper and to a Senegalese fisherman.

IV. International Skipjack Year Program

During the first year of the four-year International Skipjack Year Program, the Secretariat/Coordinator carried out the following activities:

1. Recruitment of the Coordinator

As soon as the four-year Program was adopted at the 1978 Commission meeting, the Secretariat made public the notice of the vacancy for the position of the Coordinator for the Program. After pre-screening the applicants based on each respective *curriculum vitae*, several candidates were interviewed. Finally, Dr. P. E. K. Symons (Canada) was selected for the position. Dr. Symons started working with the Secretariat in May, 1979.

2. Cooperation of other internationl organizations

A request was formally sent out to various international organizations (including FAO, UNDP, IOC, CECAF, ICES, ICNAF -now NAFO-, OECD, WECAFC, CIESM, ICSEAF, EEC, GFCM, WDC, etc). A positive answer was received only from the World Data Center. However, as each activity plan is becoming finalized, the exact needs and the inability to meet these needs regarding funds, materials and scientists are becoming clearer. Accordingly, a more specific request for cooperation is being forwarded to the most appropriate international organizations and national institutes, etc.

3. Cooperation from coastal states

Letters requesting and inquiring about the legal procedures involved to secure the research operations by aircraft and foreign vessels in the waters adjacent to the coasts of various countries have been sent out to the government authorities of all coastal states of the tropical Atlantic Ocean. Abundant information is being received from many coastal states and this has been made available to the pertinent scientists involved in pro-

gramming. Efforts are continuing to secure thorough information from all coastal states near which the field activity has been planned.

4. Activity plans

The activity plans drafted by the nine Activity Teams established at the 1978 SCRS meeting were edited and translated for the Sub-Committee on Skipjack meeting in July. After review by the Sub-Committee, the plans were considerably redrafted by the Teams and those were edited and finalized by the Coordinator and presented to the 1979 SCRS meeting. Translation was not completed at the time of the SCRS meeting due to the lack of time.

5. Organization of the Sub-Committee on Skipjack

Following the decision at the SCRS in 1978, a meeting of the Sub-Committee on Skipjack was organized in July, 1978, at Las Palmas, Canary Islands, Spain.

Members of the Sub-Committee and the Activity Team Leaders attended the meeting and all program plans were carefully reviewed and integrated. The Report (COM-SCRS/79/24) has been prepared together with the revised activity plans. The Sub-Committee also reviewed the Skipjack Year Budget and found that the loss in the monetary value since 1977, when the budget was prepared, due to inflation and the dollar devaluation make it impossible to execute the coordination of this Program with the present budget. Consequently, it recommended a new revised budget and instructed the Secretariat to transmit it to the Commissioners so that they would be in a position to discuss the new budget at the time of the 1979 Commission meeting. It was presented to the Commissioners in early September, with the text of the Report of the Sub-Committee on Skipjack.

6. Other activities

The Secretariat announced a contest for a logo to be used for the International Skipjack Year Program. The final selection was made at the 1979 Commission meeting. It is hoped that such an activity will draw some publicity to the Program.

Also, the Secretariat started preparing orders of tags and T-shirts necessary in early 1980 when the plan is to be executed. However, the ordering is presently suspended due to lack of funds. Besides, posters and pamphlets for publicity of skipjack tagging activities and the Program as a whole are being prepared.

V. Bluefin Workshop

According to the decision made at the 1978 SCRS meeting, the Secretariat prepared for and organized the Workshop in coordination with its Steering Committee. The preparatory work in which the Secretariat was involved is as follows:

1. To obtain as much catch and size data as possible from non-member countries around the Mediterranean.

2. To complete the bluefin data base as far as possible. (This work was considerably facilitated since Dr. M. L. Parrack circulated a listing of his data base in early 1979.)
3. To prepare a compendium of the description of all existing bluefin fisheries in the Atlantic.
4. To prepare a bluefin tag release and recovery file.
5. To complete the data inventory check list for all fisheries.

The biostatistician worked mainly on items 1 and 3 of the above. He visited various Mediterranean countries, actually engaged in data collection and obtained cooperation from various non-ICCAT country scientists.

The Workshop was held on September 3 to 8, 1979, at Santander, Spain (see Administrative Report). Though many non-member bluefin scientists were invited to the meeting, Italy was the only non-member country represented.

The discussion was centered on the adequacy of data. Considerable new information was gathered, and at least general agreements were reached on Task I nominal catch statistics. Since major changes were introduced to past Task I data, complete updating of the ICCAT TASKI data base was carried out and new data were circulated among pertinent scientists before the November SCRS meeting.

At the meeting, it was also agreed that the Secretariat would update and complete the Task II (catch and effort statistics) data base for bluefin and tagging files. This is now being done.

The Report of the Workshop was also prepared in the three official languages and presented as COM-SCRS/79/25.

VI. The Working Group on Juvenile Tropical Tunas

The Working Group was formerly named the "Working Group on Bigeye Size Regulation". At the 1978 SCRS meeting, the terms of reference to the Group were expanded to cover young tunas of all other species in the tropical waters. Consequently, the Group was renamed.

The Group started working through correspondence, but later the Convener of the Group and the SCRS Chairman were contacted by the FAO Fisheries Committee for the East Central Atlantic (CECAF), who proposed to hold a joint working group meeting between ICCAT and CECAF. It was agreed upon and the meeting was organized in Abidjan on September 17-21, 1979. The CECAF assumed travelling expenses for scientists from its member coastal developing countries.

The ICCAT Secretariat compiled all the pertinent data in its data base for the meeting as follows:

- Catch and effort by 1 x 1 and 5 x 5, by month and by year for all fleets (except FISM), 1969-78, for the juvenile tuna areas.
- Size frequency data by 5 x 5, by month and by year for all the fleets (except FISM), 1969-78, for the juvenile tuna areas.

– Size frequency data by 5 x 5 and month for all years combined.

CRO-Dakar and Abidjan compiled equivalent data for FISM fleets. Those data comprised the data base used at the Working Group meeting. The Group's discussion centered on the interpretation of basic data now available in terms of population study and biology of young tunas in the eastern tropical Atlantic. Also data needed for economic studies were identified and it was recommended that each national office gather such data. It was also recommended that the Secretariat contract an economist to develop a model to evaluate economic aspects of eastern tropical tuna fisheries.

The Group recommended a future working schedule. The Report was prepared by the ICCAT Secretariat in its three official languages and was presented as COM-SCRS/79/26.

VII. SCRS Officers Meeting

Following a decision made by the SCRS in 1978, the Officers Meeting was organized in July in Las Palmas, during the Sub-Committee on Skipjack meeting. The Group discussed various pending matters concerning SCRS business.

The rapporteurs for the 1979 SCRS meeting were pre-selected; document and publication policies, as well as the meeting organization were extensively reviewed. Following the results of the meeting, the Secretariat started preparations for the 1979 SCRS meeting. These included notifying and confirming acceptance of various selected rapporteurs, preparing the annotated agenda, formulating a new format for SCRS scientific papers, circulation of new statistics, scientific papers, etc.

The Report of the Officers Meeting was presented as COM-SCRS/79/23.

VIII. Other activities

1. Catch separation by large region

At the 1978 SCRS meeting the separation of the yellowfin catch by East and West Atlantic and that of albacore by North and South Atlanic were questioned. The ICCAT biostatistician engaged in comparative studies of differences in separation among the various data sources and hypotheses. The Secretariat best estimates were made and presented in SCRS/79/14 and 15 for yellowfin and albacore, respectively.

2. Coordinating Working Party on Atlantic Fishery Statistics (CWP)

The next meeting of the CWP, of which the ICCAT is a member, was postponed from 1979 to 1980. Instead an Ad Hoc Inter-agency Consultation Meeting on Atlantic Fishery Statistics was called by the CWP Secretary (FAO) in Warsaw, Poland, in September, 1979. The Assistant Executive Secretary represented ICCAT at this meeting. (See SCRS/79/5 and 17.).

3. Tuna Consultation Meeting

See the Administrative Report for details.

IX. General comments

For the following subjects, the Administrative Report (COM/79/13) should be referred to, as detailed descriptions appear there:

- Secretariat staff
- Trips by the staff
- Meetings
- Cooperation with other international organizations
- Office space

As has been already repeatedly mentioned, the work load in 1979, particularly for the coordination of research, increased tremendously, while the real value of funds decreased. Three unbudgeted inter-sessional scientific meetings took place; considerable data and document preparations were required for those meetings. These really added to the pressure for the entire Secretariat staff. The addition of the Skipjack Coordinator and some temporary starff for short periods and the extra burden shared by the regular staff made it possible to achieve the work as is reported here. However, it should also be pointed out that completion of such an overload of work cannot be expected again in 1980. If the increase in the amount of work is not accompanied by an increase in the real value of funds available, any new tasks, as well as a continuation of present tasks, will not be adequately executed in the future and the SCRS is requested to find a solution for this dilema.

(Tables 1-4 are included in Appendix 4 to Annex 7 to the Proceedings)

Table 5. Review of data availability for major fisheries — 1978 (as of November 30, 1979)

(1) Adequate coverage (2) Partial coverage (3) No coverage

Species Area	*Gear*	*Country*	*1978 Catch (MT)*	*1978 Catch o/o*	*Catch/Effort 1978 Rating*	*Catch/Effort Coverage o/o*	*Biological No. fish measured*	*Biological No. fish measured /100 MT*	*Rating 1978*
ALBACORE	LL	China-Taiwan	35240	46	(2)	34[3]	6680[3]	19	(1)
		Korea+Panama	5583	7	(1)	60[3]	2149[3]	39	(1)
		Japan[5]	600	1	(1)	100	2588	431	(1)
		Brasil	168	.	(1)	100			(3)
		Others	250	.	(3)	-	-		(3)
	Surf.	España	25154[1]	33	(3)				(3)
		France	8380	11	(1)	95			(3)
		Italy	440	.	(3)	0	-	-	(3)
		Others	544	.	(3)	-	-	-	(3)
	TOTAL CATCH		76359[4]		76359	100	76359		100
	SUM (1)				14731	19	41423		54
	SUM (2)				35240	46	0		0
	SUM (3)				26388	35	34936		46
SKIPJACK	Surf.	España	29835[1]	27	(3)				(3)
		FIS	27667	25	(3)				(3)
		Japan	14614	13	(1)	93	14252	97	(1)
		Korea+Panama	11154	10	(2)	43	3852[2]	35	(1)
		USA	8492	8	(1)	100	1475	17	(1)
		Portugal	4370	4	(3)	0	0	0	(3)

		Angola	3501	3	(1)	100	1433	41	(1)
		Ghana	2842	3	(2)	42	?	?	(1)
		USSR	2215	2	(1)	100	?	?	(3)
		Cuba	2000	2	(3)	0	8193	409	(1)
		Maroc	1948	2	(3)	0	0	0	(3)
		Others	377	.	(3)	0	0	0	(3)
		TOTAL CATCH	109015[4]		109015	100	109015		100
		SUM (1)			28822	26	42603		39
		SUM (2)			13986	13	0		0
		SUM (3)			66207	61	66412		61
YELLOWFIN	LL	Korea+Panama	13077	10	(1)	80[3]	5514[3]	42	(1)
		Cuba	2600	2	(1)	100	-	-	(3)
		Japan[5]	1700	2	(1)	100	6159	362	(1)
		China-Taiwan	695	1	(1)	95[3]	504[3]	72	(1)
		USSR	495		(1)	100	215	43	(1)
		Brasil	460		(1)	100			(3)
	Surf.	FIS	52895	40	(3)				(3)
		España	37549[1]	28	(3)				(3)
		USA	9747	7	(1)	100	1936	20	(1)
		Maroc	3734	3	(3)	0	0	0	(3)
		Angola	2296	2	(1)	100	905	39	(1)
		Portugal	1676	1	(3)	0	0	0	(3)
		Korea+Panama	1315	1	(2)	50	3372[2]	259	(1)
		Japan	807	1	(1)	95	3621	452	(1)
		Others	1975		(3)	0	0	0	(3)
		TOTAL CATCH	131021[4]		131021	100	131021		100
		SUM (1)			31877	24	30132		23
		SUM (2)			1315	1	0		0
		SUM (3)			97829	75	100883		77

Table 5. (Continued)

Species Area	Gear	Country	1978 Catch (MT)	1978 Catch %	Catch/Effort 1978 Rating	Catch/Effort Coverage %	Catch/Effort No. fish measured	Biological No. fish measured /100 MT	Rating 1978
BIGEYE	LL	Japan	10500	23	(1)	100[5]	18627	177	(1)
		Korea+Panama	9940	21	(1)	90[3]	4999[3]	50	(1)
		China-Taiwan	3357	7	(2)	44[3]	498[3]	15	(2)
		Cuba	2300	5	(1)	100	0	0	(3)
		USSR	2058	5	(1)	100	3101	155	(1)
		España	1356	3	(3)	0	0	0	(3)
		Brasil	136	.	(1)	100	?	?	(1)
	Surf.	FIS	4361	10	(3)	-			(3)
		España	3561[1]	9	(3)	-			(3)
		Portugal	2923	6	(3)	-	0	0	(3)
		Korea+Panama	2591	5	(2)	25	2578[2]	99	(1)
		Japan	1201	3	(1)	78	2581	215	(1)
		Others	1287	3	(3)	0			
	TOTAL CATCH		46201[4]		46201		46201		
	SUM (1)				26134	56	28343	61	
	SUM (2)				5948	13	3357	7	
	SUM (3)				14119	3	14501	32	

1 1977 data.
2 Fish measured by F.R.U. Tema.
3 Data from the Secretariat.
4 Including Spanish catch for 1977.
5 Preliminary.

CHAPTER II
Records of Meeting

PROCEEDINGS OF THE SIXTH REGULAR MEETING OF THE COMMISSION

Madrid, Spain, November 14-20, 1979

Table of Contents

Opening Plenary Session – November 14, 1979

Item 1. OPENING OF THE MEETING

1.1. The Commission held its Sixth Regular Meeting at the Hotel Castellana, Madrid, under the chairmanship of Mr. E. B. Young (Canada). He introduced Mr. M. Aldasoro, Under-Secretary of Fisheries of Spain.

1.2. Mr. Aldasoro welcomed all the delegates, scientists and observers attending the meeting. He specially welcomed the new member of the Commission, Cape Verde. He congratulated the Commission on its 10th Anniversary. Spain has a special interest in the work and development of the Commission as the Seat of the Commission is located in Spain and since its activities relate to the conservation of fundamental living

resources. Mr. Aldasoro noted the significant progress the Commission made on obtaining basic knowledge of tunas and developing various management plans, through cooperation of experts and the governments of member countries as well as non-member countries. He referred to the data collection and analyses developed by the Commission, the yellowfin and bluefin regulations, the international inspection scheme adopted by the Commission and finally, the International Skipjack Year Program. These can be executed only through international collaboration and Spain will support all of these programs. Mr. Aldasoro assured his trust in ICCAT activities and also promised complete support to the Secretariat.

1.3. The Chairman, Mr. Young, formally opened the meeting and welcomed all delegates. He extended an especially warm welcome to Cape Verde which recently became the 19th member of the Commission.

1.4. The Chairman referred to the First Commission meeting held in Rome, in 1969, when only ten countries were members. The Commission presently comprises 19 member countries. He observed marked improvements made by the SCRS and its scientists on statistics and progress made on the stock assessments. He reviewed the management actions taken by the Commission on yellowfin and bluefin. He specially emphasized the important development of the International Skipjack Year Program.

1.5. Mr. Young noted several important problems to be dealt with at this session, including voting procedure, bigeye size regulation, etc. He emphasized the importance of having full discussions on these problems rather than having inadequate discussions during the session and voting by mail. Although the time is limited, he asked for the good will of all delegates for full deliberation of these matters.

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

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

2.1. The Commission adopted the Tentative Agenda, which was circulated 90 days before the meeting, (attached as Annex 1). Agenda Item 9 was questioned as to whether it should be kept in the Agenda, but the Commission decided to keep this Item in the Agenda so that the opportunity would be provided for the Commission to hear the situation of this subject.

2.2. The Commission noted that the SCRS met during the preceding week and that the Standing Committee on Finance and Administration (STACFAD) and the four Panels are scheduled to meet during this week. The Commission reserved the possibility of forming any groups if the necessity arises.

2.3. There was some discussion as to whether or not Agenda Items 8, 9, and 26 should be referred to STACFAD. At a proposal by Spain, the Commission decided that the discussion and decision concerning these Items are the main concern of the Commission and they should not be referred to the STACFAD.

2.4. The Commission decided that Agenda Items 4, 5, 6, 7, 10, 11, 12, 13, 14, 15, 16, 17, 32, and 34 should be referred to the STACFAD.

Item 3. ADMISSION OF OBSERVERS

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

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

Second Plenary Session – November 15, 1979

Item 19. REPORT OF THE STANDING COMMITTEE ON RESEARCH AND STATISTICS (SCRS)

19.1. Mr. A. Fonteneau (France), Chairman of SCRS, presented the Report of the Standing Committee on Research and Statistics (Annex 7) and summarized the scientific findings. He first explained the stock evaluation models used by the scientists.

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

19.3. He also pointed out that the SCRS made various recommendations and emphasized that special attention should be given by the Commission to the following recommendations:

1) Approval of the Skipjack Year Program Plan and Revised Budget requested (Item 10 of SCRS Report);

2) Question asked by the Committee relating to the juvenile tropical tuna problem as to whether the SCRS should be involved in economic evaluation of fisheries and in part of management schemes (Item 12-h);

3) Satisfaction with the data bank and recommendation of financial support for maintaining it (Item 14);

4) Importance of biostatistical work and financial support for such work (Item 15);

5) Support for holding various intersessional scientific meetings (Item 16);

6) Continuation of present scientific publication policy (including Collective Volume) (Item 20);

7) Improvement of communication between Commission and SCRS, including more explicit questions to be asked of SCRS by the Commission (Item 22);

8) Improvement of the SCRS Report to be presented to the Commission by the Committee (Item24).

19.4. The Commission commended the outstanding work completed by the SCRS and congratulated the SCRS Chairman for the precise presentation of the summary of the Report to the Commission.

19.5. Concerning the special question asked as to whether or not SCRS should be involved in economic studies in relation to the juvenile tropical tunas, the Commission heard an opinion that the SCRS should concern itself with the biological scientific aspects and not involve itself in the economic aspects of the fisheries, as this would involve a change in the terms of reference to the SCRS.

19.6. There were diverse opinions expressed concerning the report to be presented by the SCRS to the Commission. There was a consensus that the presentation of a summary of all new scientific findings and analyses, including precise, short recommendations, would be very convenient for the Commissioners to grasp the stock situation and to act quickly on the recommendations made by the SCRS. On the other hand, it was also recognized that the full descriptions and documentation of all the basic studies and analyses made would be much desired as future reference by the Commissioners, scientists and various outside circles including industries.

19.7. Some lengthy discussion ensued on how to satisfy these somewhat contradictory needs. The Commission decided to establish a small Working Group to study this problem and Dr. L. Koffi (Ivory Coast) was nominated Chairman of the Group. Dr. Koffi stated that he would contact several delegates and form the Group and report the results of the study at a later plenary session.

19.8. The Commission decided to accept the SCRS Report, but postponed its adoption until the report by the Working Group now established is presented.

Item 8. COMMISSION DECISIONS AND VOTING PROCEDURE

8.1. The Chairman reviewed the background which led to the proposal to consider this Agenda item. At the First Special Meeting of the Commission in 1978, when voting on the bigeye regulation recommended jointly by Panels 1 and 4, the Commission interpreted Article III of the Convention and Rule 9 of the Rules of Procedure as requiring only a simple majority of countries present at the meeting in order for the Commission to make a decision, as long as a two-thirds *quorum* was constituted. As a result, the Commission adopted the recommendation on bigeye size regulation. However, after the adjournment of the meeting, a few governments questioned the interpretation of this Article and Rule. After studying the matter, the Chairman declared that the recommendation had not received enough support, that is, a majority of all Contracting Parties, and not simply those present and voting was required, and he asked for a vote by mail. (Proceedings of 1978 Commission Meeting, Item 20.10)

8.2. The Commission reviewed the document prepared by the Secretariat (COM/79/27), including the communication from FAO's legal officer outlining the evolution of the Convention Articles in question.

8.3. After a lengthy discussion, there was a consensus that, pursuant to Article III.3 and Rule 9.2, a simple majority of all Contracting Parties is required for the Commission to make any decision unless otherwise specifically provided in the Convention.

8.4. However, in view of document COM/79/27, the Spanish delegation reaffirmed the interpretation given at the First Special Meeting of the Commission, regarding Article

III, paragraph 3, of the Convention, since said Article includes reference to a two-thirds *quorum* it entails that the voting procedure requires the actual presence of two-thirds of the Contracting Parties.

8.5. In this sense, the Spanish delegation which attended the Conference of Plenipotentiaries held in Rio de Janeiro, in 1966, granted, among others, a favorable vote to the present wording of Article III in that the specific elimination of the reference to those "present" was rectified by the word *quorum*.

8.6. Several countries expressed concern that this procedure may hamper the Commission in making any important decision as the number of Contracting Parties may increase and the number of countries who are absent from the Commission meeting may increase. Therefore, a simple majority of the Contracting Parties might not be reached even if many of the countries present vote affirmatively. The possibility of seeking votes of the countries which were absent through telephone, cable, and other communication methods was suggested. However, the Commission realized that those countries which were absent from the Commission meeting may not have much interest and may not respond in time.

8.7. Various countries expressed regret that because of the different interpretations of the voting procedures of the Convention, the Commission had to delay bringing the recommendation into effect.

8.8. There was some doubt expressed about the procedure of voting by mail, in particular with respect to the interpretation to be given in the case of failure to respond, i.e. should such failure be interpreted as an abstention, an affirmative or negative vote, and should there be a deadline for such response.

8.9. Brazil proposed that the Commission admit the voting procedure taken at the First Special Meeting was incorrect, and therefore, the Commission should take another vote at this time on the same recommendation made jointly by Panels 1 and 4 at the last Commission meeting concerning the bigeye size limit regulation. Several countries agreed to this proposal. The Chairman decided to return to this subject under Item 24.

8.10. In this regard, the Commission authorized Panels 1 and 4 to hold a joint meeting if they so wish, to consider further the recommendation put forward by them at the last Commission meeting. There was some discussion as to whether or not the Commission should vote first on the original recommendation made by those Panels in 1978, even if they now propose to amend that recommendation.

Item 9. REQUEST FOR ADMISSION TO THE COMMISSION BY THE EUROPEAN ECONOMIC COMMUNITY (EEC)

9.1. The Commission noted that France had presented to the depository body (FAO) a proposal to amend the ICCAT Convention pursuant to Article XIII. This item was included on the Commission Agenda, in accordance with Rule 8-e of the Rules of Procedure. The Commission reviewed the document prepared by the Secretariat on this subject (COM/79/11).

9.2. The delegate from Japan presented various inquiries, as Japan needed such information as might be given in response to these inquiries before finalizing its position on the proposed French amendment, although he noted that his country has no objection, in principle, to having the EEC as a member of ICCAT. The first question from Japan was whether France would withdraw from the Commission when such amendments were adopted and the EEC adhered to the ICCAT Convention. In response to this question, France stated that they would withdraw from the Commission, referring to the letter sent to FAO which already mentioned this intention.

9.3. Canada reminded the Commission that, bearing in mind Convention Article XII, it may take over a year from the time France declares withdrawal until the time the withdrawal becomes effective. It would be necessary for the French withdrawal and EEC adherence to take place simultaneously in order that there would be no double membership, double voting, double contributions, etc.

9.4. The observer from the EEC assured that this problem can be solved in a practical way so that there would not be a double membership by France and the EEC.

9.5. The second inquiry made by the delegate from Japan concerned that in case any other ICCAT member country became a member of EEC whether that country would also withdraw from ICCAT. The EEC observer noted that if any ICCAT member country becomes a member of EEC, then the EEC, which has exclusive competence in Community fisheries matters, would replace that country in ICCAT. The EEC observer stated that there was no need to dwell on the matter of contributions or voting in such a case since there is only one ICCAT member country at this time which presently is a member of EEC. The Canadian representative expressed the view that in that case, the new EEC member state would withdraw from ICCAT, leaving the EEC (and its member states) as a single contracting party, with one vote, etc.

9.6. Japan also asked whether the EEC would adhere to the Convention as a sole agent or single Contracting Party representing its member countries. The EEC observer responded that as a Contracting Party they would have the same rights and obligations on behalf of the Community as those of other Contracting Parties but that responsibilities between the Community would be an internal matter of the EEC. The Canadian representative agreed that, if a party to ICCAT, the EEC would enjoy all rights and would have to fulfill all obligations under the Convention.

9.7. Japan continued its inquiries regarding whether the EEC, after adhering to the Convention, would notify ICCAT promptly of any possible changes in its competences within the Community regarding matters covered by this Convention. The EEC observer responded negatively to the extent that no such change would take place because the competence conferred to the EEC by its member states covers exclusive jurisdiction over fisheries matters, which is the sole objective of the ICCAT Convention. According to the EEC treaty, there cannot be any decrease in such competences.

9.8. The next question raised by Japan was whether there are any overseas territories belonging to France or other Contracting Parties to be EEC members in the future within the Convention area which are not covered by competence of the EEC and, if so, how these territories would be treated after adherence of the EEC to the Commission. The EEC observer responded that as there are no French overseas territories in the Atlan-

tic or adjacent seas, no such problem would arise. In any event, the Community's competence in fisheries matters applies to French overseas departments.

9.9. Canada noted that the islands of St. Pierre and Miquelon are on the Canadian coast and tuna can be fished there and the delimitation of the French and Canadian fishing zones is presently a matter of discussion between France and Canada. The observer from the EEC and the French delegation noted that they both respect the bilateral treaty between Canada and France, to which special reference is made in the Canada-EEC fisheries agreement.

9.10. Cape Verde asked whether the new amendment which permits the EEC membership (Article XIV, Paragraph 4) in ICCAT would also allow many other regional organizations to become members of the Commission. In this regard, some discussion ensued and the EEC stated that the Community did not want to limit the application of the new Article of the Convention to EEC membership only, as long as such organization fulfills the conditions stated in Article XIV. However, there is actually no other organization to which legislative powers have been transferred by its members, as is the case with EEC.

9.11. Japan, referring to Article XIII of the Convention, noted that Japan considers that these amendments should be dealt with as those not involving any new obligations to Contracting Parties.

9.12. The Canadian representative drew attention to the similarity of the text of the proposed amendment to that proposed at the Third U.N. Conference on the Law of the Sea. He suggested that, given the more limited scope of the ICCAT Convention which deals exclusively with fisheries matters over which the EEC enjoys exclusive competence, the proposed amendment should be redrafted in simpler form, in particular, deleting paragraphs 4 and 5 of proposed Article XIV.

9.13. Cape Verde also inquired whether the EEC can change its scheme so that their members can remain in various international organizations rather than requesting the organizations (such as ICCAT) to change their Convention. The EEC observer noted that the EEC has taken up its responsibilities in fisheries matters only at a recent date and unfortunately the statutes of many international organizations do not admit organizations of this type.

9.14. The Chairman noted that there is a feeling that the membership of the EEC would be profitable. However, Brazil proposed that a background information document was necessary to clarify all the implications which might arise as a result of France's proposed amendment, such as the votes for EEC, contributions, etc., so that member governments can make a proper decision on the matter. After lengthy discussion, the Commission, at the proposal of the delegate from France, agreed that the following procedure would be applied:

a) The Secretariat shall assemble all available questions/inquiries which the Commission delegates may have on this subject by 9:30 a.m. on Tuesday, November 20, 1979. Those questions will be given to the French delegate. The delegate from Senegal suggested that these questions be presented as soon as possible.

b) After the meeting and during the ensuing six-month period, government parties to the Convention are invited to submit any questions/inquiries regarding the aspects and

consequences of this amendment directly to the French government.

c) The French government will submit all the questions, etc., to the EEC which, in cooperation with France, will prepare a document with the necessary explanations and clarifications. Their report will be sent to the ICCAT Secretariat for circulation to member governments as quickly as possible.

9.15. Brazil proposed that this item be included on the Agenda for the next Commission meeting.

Third Plenary Session – November 19, 1979

Item 18. REPORT OF THE FIRST SPECIAL MEETING OF THE COMMISSION

18.1. The Report (COM/79/18), included in the 1978 Biennial Report, was presented by the Executive Secretary.

Item 19. REPORT OF THE STANDING COMMITTEE ON RESEARCH AND STATISTICS (SCRS)

19.1. The Report, previously presented by the SCRS Chairman, was now formally adopted (Annex 7).

Item 20. REPORT OF THE STANDING COMMITTEE ON FINANCE AND ADMINISTRATION (STACFAD)

20.1. The Chairman of the Standing Committee on Finance and Administration presented his Committee's Report. The Commission reviewed the Report and gave particular attention to the following Commission Agenda items:

Item 4. *Panel Membership*

Item 5. *Administrative Report*

Item 6. *Relations with other organizations*

Item 7. *Commission publications*

Item 10. *Auditor's Report 1978*

Item 11. *Financial status 1979*

Item 12. *Working Capital Fund*

Item 13. *Estimated Regular Budget 1980-1981*

Item 14. *Member country contributions 1980-1981*

Item 15. *Financial status of the Skipjack Program*

Item 16. *Review of the Special Skipjack Budget (1980-81-82)*

Item 17. *Review of the member country contributions to the Special Skipjack Budget (1980-81-82)*

Item 32. *Date and place of the next meeting of the Council*

Item 34. *Date and place of the next meeting of the Commission*

20.2. The Report, together with all the pertinent recommmendations it contained concerning the above-mentioned items, was adopted. The Report is attached herewith as Annex 6.

20.3. While adopting these recommendations, the Commission also noted that there were some reservations stated by various countries, particularly regarding the adoption of the Regular Commission Budget for 1980-81.

Item 21. REPORTS OF PANELS 1-4

21.1. The Reports of Panels 1 through 4 and the joint meeting of Panels 1 and 4 were presented by their respective Chairmen. All the Reports (herewith attached as Annex 5) were carefully reviewed and adopted by the Commission, together with all the recommendations.

Item 22. REPORTS OF SUBSIDIARY BODIES APPOINTED BY THE COMMISSION FOR THE MEETING

22.1. The Chairman (Dr. L. Koffi of Ivory Coast) of the Ad Hoc Working Group, established at an earlier Plenary Session to study the SCRS reporting system presented the results of the Group's meeting.

22.2. The Group recommended that the SCRS prepare the following two documents:

a) A detailed report which contains an outline of scientific findings, discussions, analyses, etc. This document should be annexed to the Collective Volume of Scientific Papers and should be made available to the Commission.

b) A short summary report to be discussed and approved by the SCRS and submitted to the Commission. The summary should contain only conclusions on stock status and recommendations with explanatory tables and figures.

22.3. The Group Chairman further stated that this new system should be tried at the 1980 meeting and the consequences should be evaluated at the meeting for further improvement.

22.4. The SCRS Chairman stated that the system suggested by the Group is in agreement with what was proposed by SCRS. The Commission agreed with the SCRS reporting policy suggested above.

Item 23. STATUS OF THE PROPOSALS ADOPTED BY THE COMMISSION REGARDING YELLOWFIN AND BLUEFIN

23.1. The Commission studied COM/79/12 and updated the table showing the

status of the proposals adopted by the Commission regarding yellowfin and bluefin. The table is herewith attached as Annex 4.

Item 24. RECONSIDERATION OF THE RECOMMENDATION ON THE BIGEYE SIZE LIMIT

24.1. The Commission noted that a recommendation for conservation measures was made by Panels 1 and 4 jointly for bigeye tuna. The Commission accepted this recommendation when the report was adopted (Item 21).

Item 25. OTHER POSSIBLE REGULATORY MEASURES TO BE CONSIDERED

25.1. The Commission noted that a recommendation for conservation measures was made by Panel 2 concerning bluefin. The Commission adopted this recommendation.

Item 26. STATUS OF THE PORT INSPECTION SCHEME

26.1. There was considerable discussion under this Agenda item. It was clearly confirmed that the ICCAT Scheme of Port Inspection was agreed upon and adopted by the Commission at its First Special Meeting (Madrid, November 1978). However, the Commission did not decide how to proceed in order to put the scheme into effect.

26.2. During the 1979 inter-sessional period, Canada proposed that the recommendations be put into effect according to Article IX, paragraph 3, rather than according to Article VIII of the Convention. This proposal was supported by the Commission.

26.3. Then the Commission discussed in some depth the possibility that the latter half of the sentence of Article IX-3 may conflict with the Port Inspection Scheme concerning national jurisdiction over fisheries in its extended zones of jurisdiction.

26.4. Many countries noted that the Port Inspection Scheme serves only in helping in the implementation of the ICCAT regulations and bi- or multi-lateral agreements, and therefore does not violate coastal countries' sovereignity.

26.5. In this respect the Canadian delegation expressed the view that the scheme of port inspection seems to leave open the question of whether it applied solely to fishery activities beyond 200 miles or also within waters under national jurisdiction. Nor is it clear whether or not under the scheme the port state is restricted to inspection only, leaving further enforcement action, notably the imposition of penalties, to the flag state. The Canadian delegation explained that it could not accept any scheme that would limit the right of a coastal state to enforce national laws and regulations relating to fisheries which have taken place within its zones of jurisdiction.

26.6. The discussion was centered on what instruments can be used to procede in recommending that the scheme be adopted and put into force by the Contracting Parties according to Article IX (3), since this article lacks specific procedures. In this regard, various views were expressed and studied, as follows: making bilateral or multi-lateral agreements within the framework or outside the framework of ICCAT; the Commission recommending the scheme under Article IX but using the provisions provided by Article

VIII; and the Commission establishing a new procedure at this time, etc.

26.7. Canada and Spain presented recommendations which were meant to facilitate implementing the scheme. Based on these texts, a "drafting group" consisting of Canada, Ivory Coast, France and Spain drafted a new recommendation which was unanimously agreed upon by the Commission and is herewith attached as Annex 3.

Item 27. INTERNATIONAL SKIPJACK YEAR PROGRAM

27.1. Dr. G. Sakagawa, the Convener of the Sub-Committee on Skipjack, presented the progress made by the scientists during the first year of the four-year International Skipjack Year Program. He presented the draft Sub-Committee Report with the detailed activity plans (COM/SCRS/79/24) and referred to the revised budget requested by the Sub-Committee.

27.2. The Commission noted that the Program formulated by the scientists was satisfactory.

Item 28. OTHER ACTIVITIES IN RESEARCH AND STATISTICS

28.1. The SCRS Chairman reported that his committee made various recommendations under each item of the SCRS Report. The Commission noted that there were no specific items to discuss at this time.

Final Plenary Session – November 20, 1979

Item 35. OTHER MATTERS

35.1. The Commission noted a recommendation made by the Standing Committee on Finance and Administration that an Infractions Committee be established. However, it was believed that there would not be any work for this Committee until the next Commission meeting, even if it was established at this session. Therefore, it was decided that consideration of this matter be left until the beginning of the next Commission session.

35.2. The Secretariat was instructed to include this item on the draft Agenda when preparing it for the Second Special Meeting of the Commission (November, 1980).

Item 29. ELECTION OF THE CHAIRMAN OF THE COMMISSION

29.1. Before nominations were opened, several delegations expressed their appreciation to Mr. E. B. Young, the outgoing Chairman of the Commission, for the excellent job done in chairing the sessions.

29.2. Senegal nominated Dr. L. Koffi (Ivory Coast) as the Chairman of the Commission. The nomination was seconded by France and Dr. Koffi was elected Chairman of the Commission for the 1980-81 biennial period.

Item 30. ELECTION OF THE VICE-CHAIRMEN OF THE COMMISSION

30.1. Ghana nominated Mr. H. Rosa (Brazil) for the First Vice-Chairman of the Commission and the nomination was seconded by Ivory Coast. Mr. Rosa was elected for the 1980-81 biennial period.

30.2. Korea nominated Mr. T. Isogai (Japan) as the Second Vice-Chairman; the U.S.A. seconded the nomination. Mr. Isogai was elected Second Vice-Chairman of the Commission for the coming biennial period.

Item 31. ELECTION OF COUNCIL MEMBERS

31.1. Since a Special Meeting of the Commission will be held in 1980, the Commission felt that it would not be necessary to elect members of the Council for the next biennial period.

31.2. For the same reasons Agenda Items 32 and 33 were not discussed at this time.

Item 34. DATE AND PLACE OF THE NEXT MEETING OF THE COMMISSION

34.1. The Commission confirmed the recommendation made by the Standing Committee on Finance and Administration that the Second Special Meeting of the Commission be held during the week starting on November 12, 1980, in Madrid, Spain.

34.2. The SCRS, therefore, will hold its meeting starting on Monday, November 3, 1980, in the same place as the Commission meeting, while it was understood that the Plenary Sessions of the SCRS would start on Thursday, November 6, 1980.

Item 36. ADOPTION OF REPORT

36.1. The Commission adopted the Proceedings of the Opening, Second and Third Plenary Sessions together with all their appendices.

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

Item 37. ADJOURNMENT

37.1. Before adjourning the 1979 Commission meeting, the Chairman thanked all the delegates for their collaboration and hard work and he commended the Secretariat staff and the interpreters for their efficiency and hard work throughout the meeting.

37.2. 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. Commission decisions and voting procedure
9. Request for admission to the Commission by the European Economic Community (EEC)

Finance

a) Regular Commission Budget

10. Auditor's Report 1978
11. Financial status 1979
12. Working Capital Fund
13. Estimated Regular Budget 1980-1981
14. Member country contributions 1980-1981

b) Special Skipjack Budget

15. Financial status of the Skipjack Program
16. Review of the Special Skipjack Budget (1980-81-82)
17. Review of the member country contributions to the Special Skipjack Budget (1980-81-82)

Reports to the Commission

18. Report of the First Special Meeting of the Commission

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

Measures for the conservation of stocks

23. Status of the proposals adopted by the Commission regarding yellowfin and bluefin
24. Reconsideration of the recommendation on the bigeye size limit
25. Other possible regulatory measures to be considered
26. Status of the Port Inspection Scheme

Research

27. International Skipjack Year Program
28. Other activities in research and statistics

Other matters

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

Adjournment

37. Adjournment

LIST OF PARTICIPANTS

Member Countries

ANGOLA

GARROCHO, R.
Centro de Investigaçoes Pesqueiras
Ministerio das Pescas
C. P. 677
Lobito

BRAZIL

NEGREIROS ARAGAO, J.A.
SUDEPE
Avda. W-3 Norte, Quadra 506 Bloco C
Edificio da Pesca
Brasilia, D. F. 70.000

ROSA, H.**
SUDEPE
Avda. W-3 Norte, Quadra 506 Bloco C
Edificio da Pesca
Brasilia, D. F. 70.000
(Head Commissioner)

VELASCO, P. A.
Sector Comercial
Embajada del Brasil
C/Jacometrezo, 4-7°
Madrid -13- (Spain)

CANADA

BECKETT, J. S.
Resource Services Directorate
Fisheries and Oceans Canada
240 Sparks Street
Ottawa, Ontario K1A 0E6

CREEPER, J.**
Department of Fisheries & Oceans
P. O. Box 550
Halifax, N. S.

FRASER, W.**
Elmira P. O.
Prince Edward Island

HUNTER, M.**
Department of Fisheries & Oceans
240 Sparks Street
Ottawa, Ontario K1A 0E6

ILES, T. D. (Dr.)
Fisheries and Oceans
Resource Branch
Marine Fish Division
Biological Station
St. Andrews, N. B. E0G 2X0

MACLEAN, D. A.**
Department of Fisheries
Province of Nova Scotia
P. O. Box 2223
Halifax, N. S.

ROCHON, R. J.**
Department of External Affairs
125 Sussex Drive
Ottawa, Ontario

YOUNG, E. B.
1398 Gibson Street
Ottawa, Ontario K1H 7G1
(Head Commissioner)

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

CAPE VERDE

BETTENCOURT SANTOS, H.**
Directeur National des Pêches
Ministère de l'Economie
B. P. 30
Praia

CUBA

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

RODRIGUEZ DIAZ, E.**
Oficios 110
Lamparilla y Amargura
La Habana
(Head Commissioner)

FRANCE

ANTOINE, L.*
CNEXO-COB
B. P. 337
29273 Brest

ARANAZ, R.**
Syndicat des Marins Pêcheurs
Quai P. Elissalt
64500 Ciboure
St. Jean-de-Luz

BERROUET, J.**
Eskil-Kanta
Rue St. Sas-Mend
St. Jean-de-Luz

CUEFF, J.C.**
Comité Interprofessionel du Thon
11, rue Anatole de la Forge
75017 - Paris

DION, M.**
Criée, Bureau no. 19
B. P. 127
29181 Concarneau Cédex

FARRUGIO, H.*
Laboratoire ISTPM
1, rue Jean Vilar
34200 - Sète

FAUTOUS, J. L.**
9, place d'Espagne
64500 - St. Jean-de-Luz

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

GARACHE, S.**
Direction des Pêches Maritimes
3, Place de Fontenoy
75007 - Paris

LABROUSSE, M. B.**
Sous-Directeur des Pêches
Secrétariat Général Marine Marchande
3, place de Fontenoy
75007 - Paris
(Head Commissioner)

LE GALL, J. Y. (Dr.)*
CNEXO-COB
B.P. 337
29273 - Brest Cédex

LETACONNOUX, R.*
Institut Scientifique et Technique
des Pêches Maritimes
Rue de l'Ile d'Yeu
B. P. 1049
44037 - Nantes Cédex

PARRES, A.**
Union des Armateurs à la Pêche de France
59, rue des Mathurins
75008 - Paris

PIANET, R. H.
CNEXO-COB
B. P. 337
29273 - Brest Cédex

GHANA

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

IVORY COAST

AMON KOTHIAS, J. B.
Centre de Recherches Océanographiques
B. P. V-18
Abidjan, 01

BARD, F. X.
Centre de Recherches Océanographiques
B. P. V-18
Abidjan, 01

FERRER, J. F.**
B. P. 1494
Abidjan, 01

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

JAPAN

ISHIHARA, E.
International Affairs Div.
Fishery Agency
1-2-1 Kasumigaseki, Chiyoda-ku
Tokyo

ISOGAI, T.**
Director
Fishery Division
Economic Affairs Bureau
Ministry of Foreign Affairs
Tokyo
(Head Commissioner)

ITO, M.**
Primer Secretario
Embajada del Japon en España
C/Francisco Gervás, 6-2º
Madrid -20 (Spain)

KUME, S. (Dr.)
Far Seas Fisheries Research Lab.
Fishery Agency
1000 Orido
Shimizu 424, Shizuoka pref.

NAMIE, H.*
Wakashio Fisheries Co., Ltd.
2-9-40 Kitasaiwai Nishiku
Yokohama City

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

SHINGU, C. (Dr.)
Far Seas Fisheries Research Laboratory
1000 Orido
Shimizu 424, Shizuoka pref.

TANABE, R.
Counsellor
Ocean Fisheries Department
Fishery Agency
1-2-1 Kasumigaseki, Chiyoda-ku
Tokyo

KOREA

HONG, J. H.
Embassy of the Republic of Korea
Avda. Generalisimo, 16
Madrid -16- (Spain)

KIM, B. Y.
Fisheries Research and Dev. Agency
15, 2-Ga Namhang-Dong, Yeongdo-Gu
Pusan - 606

KIM, K. H.**
International Fisheries Councillor
286 Yang-Dong, Jung-Ku, Seoul
(Head Commissioner)

KIM, S. S.
Counsulate General - Rep. of Korea
Luis Doreste Silva, 60
Las Palmas de Gran Canaria (Spain)

MOROCCO

LAHLOU, A.**
13 et 15 rue Chevalier Bayard
Casablanca

PORTUGAL

ESTEVES CARDOSO, J. C.**
Secretaría de Estado das Pescas
Av. 24 de Julho, 80
1200 - Lisboa
(Head Commissioner)

GASPAR, A. S.**
Secretaría de Estado das Pescas
Praça Duque da Terceira, 24-3-E
1200 - Lisboa

GOMEZ HENRÍQUES, J. C. G.
Sec. Regional de Agricultura e Pescas
Governo Regional de Madeira
Av. Zarco-Funchal, Ilha da Madeira

GOULART, O.**
Rua dos Mercadores, 19-2º Drt.
Ponta Delgada - S. Miguel
Azores

PEREIRA PONTES, A. F.**
Secretaría de Estado das Pescas
Praça Duque da Terceira, 24-1º
1200 - Lisboa

VELHO DA SILVA DIAS, J. M.**
Direcçao General dos Servizos de Fomento Maritimo - DGSFM
Ministerio da Marinha
Lisboa

SENEGAL

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

DIOH, B. C. (Dr.)
1, rue Joris
B. P. 289
Dakar
(Head Commissioner)

SOUTH AFRICA

CONROY, E. A.**
South African Embassy
Claudio Coello, 91-2º
Madrid -6 (Spain)
(Head Commissioner)

SPAIN

ANGULO ERRAZQUIN, J. A.**
Capitán Zubiaur, 18
Bermeo

CENDRERO, O.*
Director
Laboratorio Oceanográfico
Apartado 240
Santander

CORT, J. L.*
Laboratorio Oceanográfico
Apartado 240
Santander

DICENTA BALLESTER, A.*
Instituto Español de Oceanografía
Alcalá, 27 - 4ª
Madrid -14-

FERNANDEZ, A. M.*
Laboratorio Oceanográfico
Apartado 240
Santander

ECHEVARRIA G., J. I.**
c/o Pevasa
Avda. Arturo Soria, 211
Madrid -33-

EGAÑA ZULUETA, J. R.**
Chivichiaga, 4
Bermeo (Vizcaya)

GARCIA ESPINOSA, A.**
Asociación Nacional de Armadores de Buques Congeladores
Lagasca, 40
Madrid -1-

GARCIA MAMOLAR, J. M.**
Laboratorio Oceanográfico
Apartado 240
Santander

PRAT COLL, J.**
Subsecretaría Marina Mercante
Ruiz de Alarcón, 1
Madrid -14-
(Head Commissioner)

MESSEGUER SANCHES, J. L.**
Subsecretaría Marina Mercante
Ruiz de Alarcón, 1
Madrid -14-

MONZON BAÑO, T.**
Ministerio de Hacienda
Alcalá, 11
Madrid -14-

OLIVER, M.**
Instituto Español de Oceanografía
Alcalá, 27
Madrid -14-

REY SALGADO, J. C.*
Laboratorio Oceanográfico
Paseo de la Farola, 27
Málaga

SANTOS GUERRA, A.*
Instituto Español de Oceanografía
Centro Costero de Canarias
Avda. José Antonio, 3
Santa Cruz de Tenerife

UNITED STATES

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

BLONDIN, C. J.**
Deputy Director for International Fisheries Affairs
National Marine Fisheries Service
Department of Commerce
Washington, D. C. 20235
(Head Commissioner)

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

BUCHAN, P.**
Div. of Ralston Purina Company
Sorrento Vally Road
P. O. Box 22568
San Diego, California 92138

BRUNNENMEISTER, S.*
Southeast Fisheries Center
75 Virginia Beach Drive
Miami, Florida 33149

CARLTON, F. E.**
National Coalition for
Marine Conservation
2515 Habersham Street
Savannah, Georgia 31403

COAN, A. L.*
Southwest Fisheries Center
P. O. Box 271
La Jolla, California 92038

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

FARBER, M. I.*
Southeast Fisheries Center
75 Vriginia Beach Drive
Miami, Florida 33149

FELANDO, A.**
American Tunaboat Association
One Tuna Lane
San Diego, California 92101

FOX, W. W. (Dr.)
Southeast Fisheries Center
75 Virginia Beach Drive
Miami, Florida 33149

KERNS, O. E.**
Bumble Bee Seafoods
P. O. Box 3928
San Francisco, California 94119

MATHER, F. J. III
Woods Hole Oceanographic Institute
Woods Hole, Massachusetts 02543

MC CALEB, D.**
Office of International Fisheries Affairs
NOAA/NMFS
Washington, D. C. 20235

MILOVANOVIC, G.**
21st & C Street
Washington, D. C.

MULLIGAN, J.**
Tuna Research Foundation, Inc.
1101 17th Street, NW, Suite 607
Washington, D. C. 20036

NIZETICH, A.**
Star-Kist Foods, Inc.
582 Tuna Street
Terminal Island, California 90731

PARKS, W. (Dr.)
Southwest Fisheries Center
P. O. Box 271
La Jolla, California 92038

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

ROYAL, J. J.**
806 South Palos Verdes St.
San Pedro, California 90731

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

SILVA, M. A.**
American Tunaboat Association
1 Tuna Lane
San Diego, California 92101

STONE, R. B.**
Recreational Fisheries (F3X1)
National Marine Fisheries Service
Washington, D. C. 20235

ZUANICH, J.**
Star-Kist Foods, Inc.
582 Tuna Street
Terminal Island, California 90731

U.S.S.R

GORCHAKOV, B.
Ministry of Fisheries
12, Rozhdestvensky Blvd.
Moscow

KALIOUJHYI, A.**
Pavlihcenko, 1
Sevastopol
(Head Commissioner)

PRUSOVA, N.**
VNIRO
V. Krasnoselskaya, 17
Moscow, B-140

FAO REPRESENTATIVE

SHARP, G. (Dr.)
Fisheries Department
Via delle Terme di Caracalla
00100 - Rome, Italy

ANSA-EMMIM, M.**
(See CECAF)

Observers

CHINA (TAIWAN)

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

ECUADOR

RAMIREZ LANDAZURI, O.**
Embajada del Ecuador
General Mola, 73 - 7º
Madrid -6- (Spain)

FEDERAL REPUBLIC OF GERMANY

SCHROMBGENS, (Dr.)**
Embassy of the Federal Republic of Germany
Fortuny, 8
Madrid -4- (Spain)

HONDURAS

VAZQUEZ ALVARADO, M. A.*
Embajada de Honduras
Fernández de la Hoz, 38
Madrid -10- (Spain)

FUENTES ZELAYA, R. R.*
Embajada de Honduras
Fernández de la Hoz, 38
Madrid -10- (Spain)

ITALY

BAVIERA, M.**
Embassy of Italy
Lagasca, 98
Madrid -6- (Spain)

PICCINETTI, C.*
Laboratorio Biologia Marina e Pesca
Viale Adriatico, 52
Fano

LIBYA

SALEM JAMA, M.**
Marine Fisheries Research Center
P. O. 315
Tripoli

MEXICO

CUELLAR VIQUEZ, A.**
Departamento de Pesca
Alvaro Obregon, 269
Mexico, 7, D.F.

GUERRA, M. E.**
Departamento de Pesca
Alvaro Obregon, 269
Mexico, 7, D. F.

NIGERIA

OBAKIN, M. A.**
Federal Dept. of Fisheries
Victoria Island, P.M.B. 12529
Lagos

POLAND

KARCZEWSKI, M.**
Fisheries Central Board
Odrowaza Stn. no. 1
Szczecin

CECAF

ANSA-EMMIM, M.**
Projet Copace
UNDP
B. P. 154
Dakar, Senegal

EEC

ELLES, W.**
European Economic Community
200, rue de la Loi
1040 Brussels, Belgium

WEISS, G.**
European Economic Community
200, rue de la Loi
B-1049 Brussels, Belgium

IATTC

CALAPRICE, J. R. (Dr.)
IATTC
c/o Scripps Institution of Oceanography
La Jolla, California 92037
U. S. A.

JOSEPH, J. (Dr.)**
IATTC
c/o Scripps Institution of Oceanography
La Jolla, California 92037
U. S. A.

ICES

LETACONNOUX, R.

ICSEAF

LAGARDE, R.**
Paseo de la Habana, 65
Madrid -16- Spain

TERRE, J.
Paseo de la Habana, 65
Madrid -16- (Spain)

IWC

SAKAGAWA, G. T. (Dr.)

SPC

KEARNEY, R. (Dr.)
B. P. D-5
Noumea Cedex, New Caledonia

UNESCO

PAWSON, M. G. (Dr.)**
c/o UNDP Res. Rep. Tripoli
P. O. Box 358
Tripoli, Libya

U. N. SOUTH CHINA SEA FISHERIES

SKILLMAN, R. A.*
UN South China Sea Fisheries Development
and Coordinating Programme
P.O. Box 1184, M.C.C.
Makati Metro Manila,
Philippines

UNIVERSIDAD CATOLICA DE VALPARAISO

YANEZ RODRIGUEZ, E.*
Escuela de Ciencias del Mar UCV
Casilla 1020
Valparaiso, Chile

ICCAT SECRETARIAT

O. Rodríguez-Martín
P. M. Miyake
M. Laurent
P. E. K. Symons
V. Nordström
M. E. Carel
M. A. Fernández de Bobadilla
J. M. Manning
J. A. Moreno
A. Rick
P. M. Seidita
G. Stephens
M. J. Trapero
G. Turpeau

B. Fernández de Bobadilla
G. Goffin
F. Martínez
A. Mateo
R. Moreno
O. Rodríguez Muñoz

Annex 3

RESOLUTION – – – PORT INSPECTION

The Commission adopts the following recommendation:

> *That it draw the attention of Contracting Parties to the scheme of Port Inspection agreed by the Commission at its First Special Meeting in 1978, recommend their adoption of this scheme and request them to inform the Secretariat of their acceptance. The scheme will enter into force formally between the Parties who have accepted it, as soon as a simple majority of Contracting Parties have indicated their acceptance. In advance of its entry into force, the scheme could be applied provisionally between Parties who so agree.*

Annex 4

Summary Tables on the Present Status of the Regulatory Measures taken by each Member Country (Date entered into effect)

	YELLOWFIN	*BLUEFIN*			
		1st Regulation	*2nd Regulation*		
			(a)	*(b)*	*(c)*
Country	*In force July 1, 1973 for an indefinite period*	*In force Aug. 10, 1975 for an indefinite period*	*In force Aug. 10, 1975 until Aug. 10, 1976*	*Extended until Aug. 10, 1978*	*Extended until Aug. 10, 1980*
Angola	6-17-1979				
Bénin					
Brasil	2-23-1973	8-18-1977	8-10-1977	8-18-1977	3- 2-1979
Canada	9- 4-1973	2-17-1976	2-17-1976	2-17-1976	2-15-1979
Cuba	7- 1-1973	(no bluefin fishing for the 3-year-period, Aug. 28, 1978)			
France	6-29-1973	8- 8-1975			
Gabon					
Ghana	6-19-1976				
C. d'Ivoire	3------1970				
Japan	6-14-1973	4- 2-1975	4- 2-1975	4- 2-1975	4- 2-1975
Korea	6-21-1973	12-17-1975	12-17-1975	12-17-1975	10-14-1978
Maroc	no fishing				
Portugal	6-26-1973				
Sénégal	11- 7-1970				
South Africa	5------1973	6-27-1975	6-27-1975	10-19-1976	2- 9-1979
España	5-29-1974	3- 3-1975	2-19-1976	2-19-1976	
U.S.A.	11- 5-1975	8-13-1975	8-13-1975	5-18-1976	6-15-1979
U.S.S.R.	9-28-1978	9-28-1978			

Annex 5

REPORTS OF THE MEETINGS OF PANELS 1-4 AND JOINT MEETING OF PANELS 1 AND 4

Report of the Meeting of Panel 1

Madrid, November 1979

1. OPENING

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

2. ADOPTION OF AGENDA

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

3. ELECTION OF RAPPORTEUR

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

4. REVIEW OF PANEL MEMBERSHIP

All Panel members (Angola, Brazil, Cape Verde, Cuba, France, Ghana, Ivory Coast, Japan, Korea, Morocco, Portugal, Senegal, Spain, U.S.A. and the U.S.S.R.) were represented. When France questioned the membership status of Canada, Canada replied that it had officially withdrawn from membership of Panel 1.

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

The Chairman of the SCRS, Mr. A. Fonteneau, summarized the Standing Committee's Report.

a) Yellowfin

Mr. Fonteneau noted that Atlantic-wide catches of yellowfin have been increasing regularly for fifteen years, with a record catch in 1978 (137,000 MT). In 1979, the catch was slightly lower (124,000 MT). The surface fishery continues to increase and to expand off-shore in the eastern Atlantic. The catch-per-unit-of-effort continues to show a decline,

particularly in the surface fishery. Mr. Fonteneau noted that two spawning areas, in the Gulf of Guinea and off Brazil, have been confirmed. There may exist two stocks, with an undetermined amount of mixing among adults, however further study is necessary. If new studies which indicate that juvenile yellowfin grow at a much slower rate than previously believed are confirmed, there could be implications for the efficacy of regulations to limit size at first capture. The status of stocks is similar to last year. Yellowfin continue to be heavily exploited, especially in the eastern Atlantic. Mr. Fonteneau noted the SCRS's concern that the minimum size regulation is not fully effective. Large numbers of under-sized fish, an estimated 6,500 MT in 1978, are being either landed as other species or discarded dead. The SCRS recommended renewed effort to ensure full implementation of the regulation in order to increase yield-per-recruit and to improve the accuracy of scientific reporting with respect to yellowfin/bigeye misidentification. The SCRS further recommended that all fleets engaged in the fishery make greater efforts to provide complete statistics to ICCAT. These data will permit more accurate estimates of the number of under-sized fish captured and provide further information on the mixing of small bigeye and yellowfin.

b) Skipjack

Mr. Fonteneau noted that there was a record number of documents submitted for this species this year. He reported that the catch over the last few years was variable while there was an upward trend in effort. There appears to be an abundance of larvae in the western Atlantic off Brazil. The adult spawners in this area do not appear to be fished at present. While no MSY estimate was calculated because of the variability of necessary parameters, it appears that the skipjack stock could be exploited at a higher level. No estimate can be made at this time on how much additional fishing pressure the stock can sustain. Mr. Fonteneau stated the SCRS is looking to results from the International Skipjack Year Program to help answer many of these questions.

6. REVIEW OF POSSIBLE MEASURES FOR THE CONSERVATION OF STOCKS

a) Yellowfin

Brazil asked for an explanation of the practical difficulties mentioned in the Management section of the yellowfin chapter of the SCRS report (a-VII.3). Mr. Fonteneau replied that the difficulty existed because small yellowfin are mixed with small skipjack and bigeye. Fishing for small skipjack and bigeye often results in the catch of small yellowfin which have to be discarded.

The U.S.A. thanked the SCRS for its fine work and expressed concern that problems in the yellowfin fishery seem to be growing particularly in the area of discards. It was noted that the discard estimate of 6,500 MT may be an underestimate and that the Commission should do everything possible to see that the minimum size regulations are carried out. The U.S.A. delegate asked Mr. Fonteneau if the discards might survive. Mr. Fonteneau responded that all discards can be considered dead. Portugal asked the SCRS to look at the possibility of using closed areas or other means of regulating fishing that might be effective management measures.

b) Skipjack

No conservation measures were recommended by the SCRS at this time.

7. RESEARCH NEEDED TO BE CARRIED OUT

a) Yellowfin

The Chairman of the SCRS reported that the Committee intended to continue the types of analyses currently being made. Additionally, studies of spawning, recruitment and the spawner/recruit relationship are needed. In light of the difficulties arising from the mixing of immature yellowfin, bigeye and skipjack, and the difficulties associated with implementation of the minimum size limit, the SCRS will study alternative management measures such as season/area closures and gear modifications. The Standing Committee also will study the new estimate of yellowfin growth.

The U.S.A. and Portugal supported the SCRS recommendations.

b) Skipjack

The SCRS strongly supported the International Skipjack Year Program and has no additional recommendations.

Cape Verde noted that it is situated at a crossroads for many species of tuna and asked about plans for research in the Cape Verde area. Mr. Fonteneau replied that in the context of the International Skipjack Year Program such research is anticipated.

8. DATE AND PLACE OF THE NEXT MEETING

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

9. OTHER MATTERS

It was noted that the International Skipjack Year Program would not be discussed here since it would be covered as a separate topic in the session of the Commission.

10. ELECTION OF CHAIRMAN

Ghana was reelected Chairman.

11. ADOPTION OF REPORT

The report was adopted.

12. ADJOURNMENT

The meeting was adjourned.

Report of the Meeting of Panel 2

Madrid, November 1979

1. OPENING

The meeting was opened by the Chairman, Mr. A. Lahlou (Morocco).

2. ADOPTION OF AGENDA

The Tentative Agenda (Appendix 1) was adopted.

3. ELECTION OF RAPPORTEUR

Mr. W. Parks (U.S.A.) was elected rapporteur.

4. REVIEW OF PANEL MEMBERSHIP

The U.S.S.R. withdrew from the Panel. All other Panel members (Canada, France, Japan, Korea, Morocco, Portugal, Spain, U.S.A.) were present.

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

a) Bluefin

Mr. A. Fonteneau, Chairman of the SCRS, reviewed key points of the Committee's deliberations and conclusions concerning stocks of northern bluefin tuna in the Atlantic.

Bluefin stock structure is still uncertain. Different patterns of relative abundance of successive year-classes together with the existence of separate eastern and western Atlantic spawning areas seems to confirm the independence of spawning success. Conversely, mark-recapture and parasite studies indicate interchange of both juveniles and adults between eastern and western waters. The Committee concluded that present evidence is weak and tends towards the hypothesis of separate stocks, with a small and variable interchange of fish between them. However, the evidence is still not sufficient to reject the alternative hypothesis that there is a single Atlantic-wide stock.

No new yield-per-recruit analyses were reported. The conclusion of the 1978 analysis that further increases in yield-per-recruit could be obtained with increases in size-at-first-capture still applies.

In the eastern Atlantic, recruitment of the abundant 1974 year-class into the adult (age 6 +) stock in the near future will result in increases in the adult stock if catches of pre-adult fish do not increase. In the western Atlantic recruitment of the strong 1973 year-class and average 1972 and 1974 cohorts have increased juvenile abundance in recent years.

Implementation of ICCAT's 6.4 kg. minimum size limit in the western Atlantic has resulted in a decrease in the proportion of under-sized fish landed from 22 percent before

the regulation to 3 percent after its adoption. In the eastern Atlantic the situation is less clear. The estimated proportion of under-sized bluefin in Bay of Biscay catches increased subsequent to regulation, due primarily to a single year's catch. This proportion decreased in 1978.

Implementation of regulations to limit fishing mortality to recent years seems to have resulted in stabilized mortality in the western Atlantic since 1976. Eastern Atlantic catches have not increased since 1977, and there is no evidence to suggest that fishing mortality has increased.

The current 6.4 kg. minimum size limit has probably increased yield-per-recruit. The Committee recommended that the limit be maintained. The recommendation to limit fishing mortality appears to have been generally effective in stabilizing mortality and increasing spawning stock abundance. The Committee recommended the controls on mortality be maintained.

b) Albacore

Mr. Fonteneau noted that the traditional division of Atlantic albacore into north and south stocks is accepted by most experts. The Committee felt that current north Atlantic albacore catches are near MSY. The recent distribution in fishing mortality toward larger fish can be expected to result in an increase in yield-per-recruit.

In 1978 the Committee expressed serious concern over the apparent steady decline in recruitment since 1960. Spawning stock was estimated to be very low, approximately 20 percent of its original (1950-1957) size. A period of large fluctuations in recruitment was associated with the period of low spawning stock abundance. Analyses presented in 1979 ease the previous concerns.

A new recruitment-index series indicates that recruitment since 1960 has declined only slightly; variability, while considerable, now appears to have been less than previously estimated. Results of a stochastic spawner-recruit study suggest that the probability of low recruitment is small. The Committee noted, however, that the spawning stock is still considered low, between 20 and 40 percent of 1950-57 levels.

The Committee concluded that previous concerns over apparent low levels of recruitment are no longer justified and made no specific management recommendations. The Committee, however, noted that spawning stock appears to be at a very low level. The Commission should be prepared to adopt regulations should either recruitment or stock abundance be estimated to decline.

6. REVIEW OF POSSIBLE MEASURES FOR THE CONSERVATION OF STOCKS

a) Bluefin

The delegate from the U.S.A. noted that the status of bluefin stocks has been of serious concern to the Commission since 1973. As a result of this concern, the Commission in 1974 recommended that Contracting Parties establish a permanent minimum size limit of 6.4 kg. In addition the Commission recommended that fishing mortality on bluefin be limited to recent levels for a period of two years in order to preserve the spawning stock and thus prevent recruitment failure. Subsequently this recommendation was renewed and expires on August 10, 1980.

The delegate noted that considerable progress has been made to comply with the implementation of the regulations, particularly in the western Atlantic. Implementation has not been without difficulty; in the U.S.A. violations have been discovered, regulations enforced and fines levied. The delegate urged compliance throughout the Atlantic and recommended continuing the mortality limitation recommendations for at least two more years.

The delegate from Japan noted the increase in spawning stock abundance since implementation of the conservation measures and expressed support for the U.S. proposal.

The delegate from Canada stated that Canada's main interest in membership in ICCAT is to protect bluefin tuna. He reminded the Panel of Canada's proposal for a two-stock management system at last year's Special Meeting. He noted the resistance of some delegations this year to such a plan despite indications from the SCRS that separate eastern and western stocks may exist. Canada stated that since it was apparent that such proposals would not be accepted, it does not intend to propose two-stock management at this time.

The delegate from Spain expressed concern over high catch levels of under-sized fish in the eastern Atlantic, mainly in Spanish waters. He noted that, in the past, the Moroccan baitboat fishery has been a significant contributor to this problem, but since Moroccan fishing in this area has declined, Spanish fishermen now seem to be responsible for this catch of under-sized fish. He informed the Panel that legislation has been introduced in the Spanish Parliament which will help to ameliorate the problem.

The delegate from Portugal expressed his support for two-stock management if warranted by scientific evidence. He noted that perhaps a management system based on a division of the Atlantic into two areas at 40° W longitude could be considered.

The delegate of Japan agreed that two-stock management would be appropriate if supported by scientific evidence. However, the biological evidence continues to be unclear and many questions need to be answered prior to any change to the current system. Therefore, Japan supports the present one-stock management system.

The Spanish delegate supported the position of Japan stating that it is necessary to intensify research on stock structure before considering changes to current management measures.

The delegate from Portugal drew attention to the fact that the SCRS feels that two stocks of bluefin may exist. Portugal suggested that the SCRS intensify its research in order to provide the Commission with a clear picture of bluefin stock identity.

The U.S. delegate agreed with Portugal. If the scientific evidence clearly indicates that there are two bluefin stocks, two-stock management would be appropriate. He pointed out, however, that the evidence is not clear, noting that the SCRS Report states "the evidence is still not sufficient to reject the alternative hypothesis that there is a single Atlantic-wide stock".

The delegates of Canada and France supported the U.S. proposal to continue the current management regime.

The SCRS Chairman stated that the question of bluefin stock identity is complicated and that the SCRS will continue to try to resolve the issue. The true structure lies somewhere between two completely distinct stocks and one homogeneous Atlantic-wide stock. The answer is likely to be always ambiguous and the Commission should not expect a single answer.

The Panel Chairman noted a consensus emerging. Current regulations should remain in force, i.e. regulation of limiting fishing mortality to recent levels be extended until August 10, 1982, while the present size limit still be enforced until otherwise recommended and the SCRS asked to continue research to resolve the stock structure question.

b) Albacore

The delegate from the U.S.A. noted that the SCRS is still concerned over the low level of the albacore spawning stock. He stated it is necessary to highlight this concern to the Commission.

7. RESEARCH NEEDED TO BE CARRIED OUT

The Chairman of the SCRS referred the Panel to research recommendations in the Report of the SCRS. He emphasized the need for research on bluefin stock identity and on recruits and spawning stock abundance. For albacore he noted the need to update production models and to confirm results of recent recruitment analyses.

8. DATE AND PLACE OF THE NEXT PANEL MEETING

The Panel agreed to meet at the time and place of the next ICCAT Meeting.

9. OTHER MATTERS

No other matters were discussed.

10. ELECTION OF PANEL CHAIRMAN

Morocco was re-elected Chairman for the next biennial term on a motion by France and seconded by Portugal.

11. ADOPTION OF REPORT

The report was adopted.

12. ADJOURNMENT

The Panel adjourned.

Report of the Meeting of Panel 3

Madrid, November 1979

1. OPENING

The meeting was called to order by the Chairman, Mr. R. Tanabe (Japan).

2. ADOPTION OF AGENDA

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

3. ELECTION OF RAPPORTEUR

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

4. REVIEW OF PANEL MEMBERSHIP

All the member countries were present. Those are: Brazil, Japan, Korea, South Africa and U.S.A. The Panel noted that the U.S.S.R. had withdrawn from this panel.

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

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

a) Bluefin, South (Southern bluefin - Thunnus maccoyii)

The species consists of a single stock which has been exploited extensively in the Atlantic as well as in the Indian and Pacific Oceans only by Japan and Australia. The resources are jointly studied and management measures are taken by these two countries.

b) Albacore, South

The stock is distinctly and independently identified from the North Atlantic albacore stock. Presently only longline is catching this stock at a level of 20,000 MT. The maximum sustainable yield was estimated in 1978 at about 30,000 MT.

No increase in Y/R can be expected by increasing age-at-first-capture as they are caught only by longline.

6. REVIEW OF POSSIBLE MEASURES FOR THE CONSERVATION OF STOCKS

a) Bluefin, South (Southern bluefin)

The Panel noted the voluntary regulatory measures taken by Japan on this species since 1971 and by Australia since 1976. Those are documented in the Report of Indo-Pacific Tuna Stock Assessment Workshop (1979, Shimizu).

b) Albacore, South

No comments were made.

7. RESEARCH NEEDED TO BE CARRIED OUT

The Panel confirmed all the recommendations made by the SCRS concerning research needed on the stocks in question. Concerning albacore, a recommendation was made to accurately separate Atlantic albacore catches by south and north. For southern bluefin tuna, better age determination is recommended.

8. DATE AND PLACE OF NEXT PANEL MEETING

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

9. OTHER MATTERS

No other matters were discussed.

10. ELECTION OF CHAIRMAN

Japan was reelected Chairman.

11. ADOPTION OF REPORT

The report was adopted.

12. ADJOURNMENT

The meeting was adjourned.

Report of the Meeting of Panel 4

Madrid, November 1979

1. OPENING

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

2. ADOPTION OF AGENDA

The Agenda was adopted without change (Appendix 1).

3. ELECTION OF RAPPORTEUR

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

4. REVIEW OF PANEL MEMBERSHIP

The Panel Chairman reviewed the membership of Panel 4: Angola, Canada, Cuba, Japan, Korea, Portugal, Spain, the U.S.A. and the U.S.S.R. All the members of the Panel were present.

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

The Chairman of the Panel asked Mr. A. Fonteneau, SCRS Chairman, to review the SCRS Report.

a) Bigeye

Fifteen documents, which included various aspects such as statistics, biology, stock evaluation, etc., were presented and reviewed by the SCRS.

Bigeye catch trends, after an increase from 19,000 MT in 1966 to more than 58,000 MT in 1974, indicate a decrease, with a catch of 44,000 MT in 1978. The major part of the catch is made by longline. However, it should be noted that the recent high level of catches in the tropical fishery are due, primarily, to increases in surface catches. It is believed that no satisfactory CPUE indices exist for the surface fishery. It should also be observed that there was an increase in surface fishing effort. It was also indicated that the North Atlantic longline fisheries show a very variable CPUE.

Concerning stock structure, up to now the SCRS has not been able to obtain definite results. Due to this, analyses based on the two stock hypotheses are still being carried out. An imposition of the bigeye size limit would directly affect the baitboat fisheries exploiting small bigeye. However, it would benefit the longline fisheries and baitboat fisheries catching large size bigeye. It should also be noted that the current effort exerted on this species is approaching the effort corresponding to the MSY. Concerning statistics, it was recommended to improve catch statistics, this being an important aspect. It was also indicated that it is necessary to carry out intensive sampling and studies to obtain a better knowledge of the mixing rate in the fisheries.

The proposed bigeye size limit would facilitate the application of the 3.2 kg yellowfin size limit that is in effect, for which the SCRS reiterates its recommendation of a 3.2 kg minimum size limit for bigeye as this would increase yield-per-recruit. It should be noted that even though it is possible for the optimum minimum size to be above 3.2 kg, the SCRS does not intend to recommend other measures, although other problems, of an economic nature, were presented for some fisheries.

Finally, it was noted that the Working Group on Juvenile Tropical Tunas would be responsible for analyzing management measures other than the proposed minimum size.

b) Billfishes

Several important species exist. These were studied in various documents presented to the SCRS this year. Difficulties concerning fisheries data were noted as the catch trends are not well known and it is difficult to interpret the CPUE.

Concerning blue marlin, an increase in fishing intensity has been observed, with catches reaching approximately 2,000 MT. The catch of white marlin has decreased to

1,200 MT.

Sailfish catches are reported to be approximately 5,000 MT. In 1978, the swordfish catch, even though thought to be under-estimated, reached a record amount of 18,700 MT. It was noted that fishing effort for this species increased in the U.S.A. and Canada.

Stock structure is not well defined and there are uncertainties as to which is the most adequate hypothesis. The status of the stocks is also not well defined, since adequate production models are not available.

Concerning blue marlin, it was observed that the MSY is approximately 5,600 MT since the current effort exerted on the species is superior to the estimated optimum effort.

The current appraisal of the stocks depends on production models and on available data, which up to now are considered to be inadequate.

White marlin is also considered to be heavily exploited.

Little progress has been observed in statistics. These should be improved in general and above all in species breakdown.

No management measures have been recommended. However, the white marlin and blue marlin fisheries should be closely monitored. Effort should be reduced on these species, since it seems that the stocks are being over-exploited.

c) Other species

Statistics are inadequate for the small tuna species. As a result it is quite difficult to know accurately the state of the stocks.

6. REVIEW OF POSSIBLE MEASURES FOR THE CONSERVATION OF STOCKS

a) Bigeye

The delegate from the United States presented a brief overview of the matters discussed at the Joint Meeting of Panels 1 and 4 held at the time of the First Special Meeting of the Commission. He expressed his opinion with respect to the differences in information found upon studying the size limit regulations of bluefin, yellowfin and bigeye. He pointed out that it is possible that we are presently nearing the MSY of bigeye, unlike the case of yellowfin. Therefore, it would be necessary to increase the bigeye catch in order to clearly define the situation with respect to fishing effort. Besides, it should be emphasized that a minimum size regulation would have negative repercussions on the fisheries, although this measure would scarcely affect the U.S. fisheries. However, the U.S. delegate noted that the interests of the majority of the countries should be taken into account. Finally, the U.S. delegate proposed that a joint meeting of Panels 1 and 4 be held.

The delegate from Spain supported the proposal of a joint meeting of the two Panels if it would be necessary. However, it should be emphasized that, just as in 1978, the SCRS propose the necessity of said conservation measures. The delegate from Portugal expressed their wish to continue the discussions if an amendment were presented to the conservation measure.

The delegate from U.S. stated that the regulation in question could be reviewed as has been done in the past for bluefin mortality levels, which were studied for an initial

period of one year and then two years. He concluded with the following proposed amendment:

–That the above regulatory measures be the subject of revision at the time of termination of the International Skipjack Year Program with the intention of maintaining such measures for an additional four-year period unless the SCRS presents a different recommendation to the Commission.

The delegate from Portugal supported the proposed amendment presented by the U.S. The delegate from Senegal expressed doubts concerning the proposed amendment, as he thought the U.S. would place a time limit on such a recommendation.

The delegate from the U.S. clarified that the measure would not be terminated after four years but would be reviewed.

The Chairman of the Panel presented a new version of the proposed amendment prepared by a country which is not a member of this panel, as follows:

–With the intention of maintaining such measures for additional periods of four years following the recommendations of the SCRS.

The delegate from Portugal stated that the matter has to be discussed only in a joint meeting of Panels 1 and 4. Afterwards, the Panel dealt with the proposal of immediately holding a joint meeting of Panels 1 and 4. The delegate from the U.S. thought it appropriate that the consideration of the proposed amendments be left to the joint meeting of Panels 1 and 4.

The delegate from Portugal submitted the following amendment of the U.S. proposal to the Panel for consideration:

–That the above regulatory measures be the subject of revision at the time of termination of the International Skipjack Year Program with the intention of maintaining such measures for an additional four-year period unless the Commission adopts a different recommendation from the SCRS.

The delegate from Spain considered the Portuguese amendment acceptable. The delegate from the U.S. supported the Portuguese modifications. The delegate from Japan reserved his position concerning the amendment.

Finally, it was agreed to refer these amendments to the joint meeting of Panels 1 and 4.

b) Billfishes

The delegate from Canada noted the large increase in swordfish fishing effort in the North Atlantic and requested the SCRS to increase their studies on this subject. The delegate from the U.S. added that the blue marlin, white marlin and swordfish fisheries be more closely monitored. Measures should be taken if so indicated by stock analysis. The

U.S. delegate then supported the Canadian proposal concerning swordfish, and added that the U.S. is planning management for this fishery as well as other billfishes, and emphasized that the U.S. will cooperate with ICCAT in international management of these species. Portugal expressed its concern about swordfish and emphasized the need for improved statistics.

7. RESEARCH NEEDED TO BE CARRIED OUT

The SCRS expressed difficulties concerning stock identification and suggested that bigeye tagging studies be carried out, as well as analysis of existing data, analysis of bigeye cohorts, detailed analysis of yield-per-recruit, in order to estimate exact size limits, etc.

Concerning billfishes, the SCRS recommended population and growth parameter studies, as well as studies of the sport fishery abundance index and detailed tagging analysis. Improved swordfish statistics should also be made available. Finally, the need for adequate catch and effort statistics as well as population dynamic studies on bonito was pointed out.

8. DATE AND PLACE OF NEXT PANEL MEETING

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

9. OTHER MATTERS

No other matters were discussed.

10. ELECTION OF PANEL CHAIRMAN

Spain was reelected Chairman.

11. ADOPTION OF REPORT

The report was adopted.

12. ADJOURNMENT

The meeting was adjourned.

Report of Joint Meeting of Panels 1 and 4

Madrid, November 1979

1. OPENING

Mr. J. Prat Coll (Spain) was asked to chair the meeting of Joint Panels 1 and 4.

2. AGENDA

The Chairman noted that the subject of a minimum size limit for bigeye tuna constituted the business for discussion and that a proposed regulation had been referred to the Joint Panels by Panel 4. Brazil noted that the possibility of moving bigeye tuna to the mandate of Panel 1 had been raised at the First Special Meeting, but had been deferred. This topic was added to the Agenda

3. ELECTION OF RAPPORTEUR

Mr. J. S. Beckett (Canada) was nominated Rapporteur.

4. REVIEW OF PANEL MEMBERSHIP

With the exception of Morocco, all other members of Panels 1 and 4 were present (Angola, Brazil, Cape Verde, Canada, Cuba, France, Ghana, Ivory Coast, Japan, Korea, Portugal, Senegal, Spain, United States and the U.S.S.R.).

5. RECOMMENDATIONS ON THE BIGEYE SIZE LIMIT PROPOSED IN 1978

Ghana proposed an amendment to the proposal for a minimum size limit for bigeye that had been referred to the meeting by Panel 4, that would have deferred implementation of the regulation until after the completion of the International Skipjack Year Program. It was noted that Ghana had supported fully ICCAT at all times but did not believe that a minimum size limit was justified at the present time. Furthermore, it would be impossible for Ghana to comply with the regulation because the size of the bigeye occurring off the Ghanaian coast was small and the high price of fuel made it impossible for vessels to roam further seeking larger fish. Should the regulation be adopted, Ghana would be forced to lodge an objection rather than to pretend that it had accepted the regulation. Ghana would pledge to strive diligently to find ways to reduce the catch of small bigeye and when it was felt that Ghana could, in all conscience, accept the regulation, the objection would be withdrawn.

France proposed that the minimum size limit be implemented until December 31, 1982, and that the Commission meeting immediately prior to that date review the regulation for the purpose of possible extension.

Spain noted that the meeting of ICCAT in 1982 could be one of the Council rather than of the Commission, and as such, not appropriate for the review of a regulation.

A small working group was then established to review the various proposals and to develop a consolidated text if possible. This group produced a text (Appendix 2) which was presented to the full meeting. France stated that the choice of December 31, 1982 was made because the full evaluation of data from the Skipjack Program would not be available in 1982.

Ghana withdrew its proposal but reiterated that it would be forced to lodge an objection to the regulation if adopted, which would be withdrawn when means of compliance had been developed.

The Executive Secretary pointed out that if the regulation terminated on December 31, but was subject to review only during the month prior to that, any renewal would not come into force until the middle of the following year, leaving some months during which the regulation would lapse. The Panels decided however that this matter could in practice be avoided.

After further discussion of the actual date of initial expiration, the proposal (Appendix 2) including the date of December 31, 1983, was put to a vote. The Joint Panels agreed 12 in favor with one (Ghana) negative vote, two (Japan and U.S.S.R.) abstentions and one (Morocco) absent, to present the proposed regulation to the Commission.

The question of transferring bigeye tuna from Panel 4 to Panel 1 was referred to STACFAD, and there being no other business, the meeting of the Joint Panels was adjourned.

Appendix 1 to Annex 5

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

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

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

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

Appendix 2 to Annex 5

Proposed Bigeye Tuna Regulation

According to Article VIII-1 (b) (iii), Panels 1 and 4 jointly propose:

- *That the Contracting Parties take the necessary measures to prohibit any taking and landing of bigeye tuna (Thunnus obesus) weighing less than 3.2 kg until December 31, 1983.*

- *Notwithstanding the above regulations, the Contracting Parties may grant tolerances to boats which have incidentally captured bigeye tuna weighing less than 3.2 kg with the condition that this incidental catch should not exceed 15 percent of the number of fish per landing of the total bigeye catch of said boats.*

- *At the Commission Meeting immediately prior to the expiration date of the regulatory measures stated here above, these measures shall be subject to general review for the purpose of possible extension.*

Annex 6

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

Madrid, November 1979

Table of Contents

Item 1. OPENING

1.1. The Standing Committee on Finance and Administration (STACFAD) met at the Hotel Castellana (Madrid, Spain) on November 14, 1979, and subsequent days. The meeting was opened by the Chairman of the Committee, Mr. C. J. Blondin (U.S.A.). He welcomed Cape Verde as a new member of the Commission and this Committee.

1.2. Mr. Blondin noted that even though ICCAT is celebrating its 10th anniversary this year, the Commission is still a relatively new international organization. He also noted that the foundation of the Commission must be solid and that our foundation is based on our well-qualified scientists. The Commission is now at a crossroads, from a budgetary standpoint, and that the rapidly rising inflation rates and the devaluation of currencies all have an impact on the efforts of ICCAT, which lead to rising costs in general. It seems that the Commission may end this fiscal year with a negative balance. The Chairman stated that he had sent a special letter to the Commissioners expressing his concern about the budgetary problems. The Commission has been very conservative in considering budgets, and this has resulted in almost no flexibility in managing funds. To maintain the present level of spending without any increase in activities would require a 28-30 percent increase over the 1979 budget. This would represent a relatively substantial increase for some countries. However, the budget as a whole, in absolute value, is rather small. He hoped that the Commission considers that a little investment now would result in a good return in the future.

Item 2. ADOPTION OF AGENDA

2.1. The Tentative Agenda, circulated 90 days prior to the meeting, was reviewed by the Committee. The Committee noted that the Commission Agenda Items 4, 5, 6, 7, 10, 11, 12, 13, 14, 15, 16, 17, 32 and 34 were referred to the Committee by the Commission. Consequently, the Tentative Agenda was modified accordingly.

2.2. The Committee decided that the establishment of an "Infractions Committee", which was suggested at the 1978 STACFAD meeting, be added to the Agenda.

2.3. With these modifications, the Agenda was adopted and is herewith attached as Appendix 1.

Item 3. ELECTION OF RAPPORTEUR

3.1. Dr. P. M. Miyake (Secretariat) was designated Rapporteur.

Item 4. PANEL MEMBERSHIP

4.1. The Committee reviewed document COM/79/9, which provided detailed information on Panel membership.

4.2. Panel 1 – The Committee noted that Cape Verde wished to join this Panel. On the other hand, the delegate from Canada stated that his country wished to withdraw from Panel 1, since Canada does not have a fleet fishing tropical tunas.

4.3. Panel 2 – The delegate from the U.S.S.R. stated that his country wished to withdraw from Panel 2, since the Soviet Union has practically no fishing on the species covered by this Panel.

4.4. Panel 3 – The U.S.S.R. also withdrew from Panel 3, as that country does not have too much interest in the species covered by this Panel.

4.5. The Committee noted all these changes. The current status of Panel Membership is attached as Appendix 2 to this Report.

Item 5. ADMINISTRATIVE REPORT

5.1. The Administrative Report (COM/79/13) was presented and fully explained by the Executive Secretary. He noted that Cape Verde became a new member of the Commission during 1979. Thus, the Commission now consists of 19 member countries.

5.2. The Executive Secretary outlined all the activities of the Secretariat and the Commission, including various ICCAT inter-sessional meetings, meetings at which the Commission was represented, cooperation with other organizations, the ICCAT data bank, the Skipjack Year Program, ICCAT publications, the Secretariat staff and the Secretariat office space.

5.3. The Committee reviewed the Administrative Report and recommended that the Commission approve the Report.

Item 6. RELATIONS WITH OTHER ORGANIZATIONS

6.1. The Committee studied the relationships the Commission has maintained with various international organizations (COM/79/13) and found them to be satisfactory. Our relationship with the General Fisheries Council for the Mediterranean (GFCM) was questioned and the Committee was informed that ICCAT maintains a channel of periodical data exchange between the two organizations.

Item 7. COMMISSION PUBLICATIONS

7.1. The Committee studied the pertinent sections of the Administrative Report pertaining to Commission publications (COM/79/13). The Committee noted, in particular, that the high quality of the Biennial Report was maintained, while there was a substantial savings in its publication cost for 1979 through the use of the newly obtained IBM MC Composer. The Committee congratulated the Secretariat for its work.

7.2. In response to a question regarding the translation of the Skipjack Year Program Plans, the Executive Secretary noted that this work will be completed by early January, assuming that the Sub-Committee on Skipjack finalizes the Report by early December, 1979.

Item 8. AUDITOR'S REPORT 1978

8.1. It was noted that the Auditor's Report (original in Spanish) with summary translations in English and French, was circulated to the head of each delegation in early 1979. The Report was reviewed and adopted by the Committee and then recommended to the Commission for adoption.

Item 9. FINANCIAL STATUS 1979

9.1. Before reviewing the financial status of the Commission, the Executive Secretary presented document COM/79/INF-1, which summarized the complete history of the administrative and financial aspects of the Commission. The Committee noted that the document is informative as a reference for various items.

9.2. The Financial Report (COM/79/14) was presented and fully explained by the Executive Secretary. He emphasized the difficulties with finances caused by inflation and fluctuation in currency exchange rates as the Budget was adopted in 1977 while the expenses were incurred in 1979. In addition to these problems, many unforeseen research assignments were given to the Secretariat including three inter-sessional scientific meetings organized by the Commission in 1979.

9.3. The Executive Secretary reviewed the Commission's financial status forecast to the end of Fiscal Year 1979, member country contributions, expenditures during 1979, budgetary situation of the International Skipjack Year Program, etc.

9.4. The Committee noted that it is forecast that the Commission will be ending the fiscal year with a negative balance of approximately $23,000. This is the first time in ten years that the Commission has had a negative balance. The Committee recommended to the Commission that a sum equalling the deficit at the end of the 1979 Fiscal Year be removed from the Working Capital Fund and be used for paying the deficit of the 1979 Commission budget.

9.5. While reviewing the member country contributions as of November 14, 1979, the Committee realized that there are $91,910.79 pending payment to the Regular Budget and $22,113 to the Special Skipjack Budget.

9.6. Ivory Coast stated that the payment of their contributions had to go through long administrative procedure but the Commissioners are trying to solve the difficulties with the least delay. The Portuguese delegate commented that the Portuguese national budget had been passed late in the year, the reason why their payment was delayed. However, the procedure of paying contributions is now being worked out and it is expected that their contributions will reach ICCAT within a short time. The Ghanaian delegate also stated that his country has settled the problem and that their contributions are on the way.

9.7. France and Spain stated that both countries were at the point of paying their contributions to the Skipjack Budget and the only probable delay now will be in bank procedure. Cuba stated that the contribution to the Regular Budget will be settled in the first quarter of 1980. The Senegalese delegate stated that Senegal has taken the necessary steps and that the payment for the Regular Budget is underway. However, their contribution to the 1979 Special Skipjack Budget has been paid.

9.8. The Committee noted that the pending contributions cause significant difficulties in administering the Secretariat but that marked progress will be made in the very near future.

Item 10. WORKING CAPITAL FUND

10.1. The Committee reviewed Statement 10 of the Financial Report (COM/79/14), and found it to be satisfactory. It recommended that all the unbudgeted income would go into the Working Capital Fund. On the other hand, it noted that the deficit of the Commission Budget at the end of Fiscal Year 1979 would be paid from the Working Capital Fund.

Item 11. ESTIMATED REGULAR BUDGET 1980-1981

11.1. The Estimated Regular Budget for the biennial period 1980-1981 was presented by the Executive Secretary (COM/79/15). A detailed explanation was given.

11.2. The Committee noted that the Commission has had serious financial difficulties which were brought about by a high inflation rate and the change in monetary exchange rate in terms of the peseta, on which the Commission budget is based. These difficulties were further aggravated by the fact that the budget is approved for a biennial period and therefore the 1979 budget was adopted in 1977.

11.3. While recognizing these difficulties, most of the countries expressed concern about the substantial increase proposed for the 1980 and 1981 budgets, which total $666,920 and $800,174, respectively.

11.4. The French delegation, recognizing the problem that the Commission now faces, noted that their government cannot accept any increase of more than 10 percent, in general, or, specifically, not more than a 25 percent increase in the French contribution in terms of U.S. dollars.

11.5. In response to an inquiry, it was clarified that according to the FAO salary scheme which the Commission adopted, the Secretariat staff salaries are adjusted periodically for currency exchange fluctuation and inflation. Therefore, even though the salaries are paid in U.S. dollars, the total amount is affected by the fluctuation of the U.S. dollar exchange rate in terms of pesetas.

11.6. The Committee decided to consider the proposed budget (which is legally shown in U.S. dollars) in terms of peseta values. In 1977, the 1979 budget ($429,000) had a value of 36,465,000 pesetas at the time of its adoption (1 US $ = 85 pesetas). At the present exchange rate (1 US $ = 66 pesetas), $552,500 would be needed to reach that same peseta value.

11.7. Canada proposed that a 10 percent increase of the total 1980 budget in terms of peseta value (i.e. a total of U.S.$ 607,750) would be a reasonable basis to consider and that the Executive Secretary revise the budget by chapters accordingly.

11.8. This proposal was generally accepted by the Committee. The delegate from Portugal considered that both dollar devaluation and also inflation should be taken into account. Spain, supported by Portugal, proposed that the Executive Secretary, when revising the budget, should be given some flexibility, but should not exceed a total budget of U.S.$ 625,000.

11.9. The SCRS Chairman stated that there had been increasing scientific tasks to be carried out by the Commission. There is also an absolute need for funds for assignments to be carried out by the Secretariat. Any cuts in the budget will have considerably more impact on the research chapter than on the administrative chapters and will make it difficult to carry out these tasks.

11.10. There was a consensus that the Executive Secretary prepare a revised budget, keeping in mind a total of U.S.$ 620,000 to $625,000 for the 1980 budget, and permitting a 20 percent increase over the 1980 level for the 1981 budget.

11.11. Some countries reserved their opinions until such time that a revised budget showing a recalculation of the country contributions, based on such a revised budget, became available.

11.12. The Executive Secretary presented a revised budget of $625,000 for 1980

and $750,000 for 1981. The new total for 1980 represents a 12.6 percent increase over the 1979 budget in terms of pesetas and a 20 percent increase in terms of dollars over 1980 for the 1981 budget.

11.13. The Committee decided to recommend the adoption of this newly revised Regular Commission Budget for the next biennial period (1980-1981) which is herewith attached as Appendix 3.

11.14. Brazil and France expressed their reservation to this recommendation.

11.15. The Committee also understood that the Commission has the right to make an adjustment to the 1981 budget, which is now estimated, if and when it meets in 1980, taking into account the exchange rate and inflation rate at that time.

Item 12. MEMBER COUNTRY CONTRIBUTIONS 1980-1981

12.1. The Committee agreed to calculate the country contributions based on the catch and canning figures for 1977, since the 1978 figures are still preliminary for many countries. Also the recent changes in Panel membership were taken into consideration.

12.2. The member country contributions for 1980 and 1981, calculated according to the formula specified in Article X of the Convention, are herewith attached as Appendix 4.

12.3. The delegate from Morocco observed that the formula by which the member country contributions to the budget are calculated, might be unfair to the countries which have rather large catches of commercially unimportant species. The Committee noted that the contributions are calculated based on Article X of the Convention and that any change in the calculation scheme would involve an amendment to the Convention text, thus requiring formal procedures to be taken under Article XIII of the Convention and Rule 8.2.c of the Rules of Procedure.

12.4. The Moroccan delegate stated that his government would give serious consideration to the subject and might propose an amendment to the Convention before the next Commission meeting in accordance with the legal procedures outlined in the Convention.

12.5. It was suggested that if an amendment to the Convention is proposed, that some consideration be given to the possibility of changing the basic fee (i.e. $1,000) for Commission membership and $1,000 for each Panel membership, since the Convention was drafted almost 15 years ago and the value of $1,000 has changed significantly in the meantime. However, the Committee also observed that an increased basic fee would mean an increase in the contribution of those countries which have low tuna catches.

12.6. After reviewing the budget, the delegate from Ivory coast, surprised by the large increase in his country's contribution as compared to the table of country contributions distributed by the Secretariat in September, 1979, which was the working document of the Committee up to now, requested an explanation. The reason for such increase was that the canning figures provided by Ivory Coast just before the meeting were

higher than those on which the prevision of contributions was calculated in September. Following this explanation, the delegate from Ivory Coast expressed his disapproval of the last-minute readjustment procedure. The Committee noted that all countries are treated equally since the most recent data for a particular year (in this case, 1977) for each country are used.

12.7. The Executive Secretary stated that the contributions cannot be accurately calculated until the catch and canning figures are confirmed by all member countries and new Panel membership established. However, by the decision of the Commission a few years ago, the Secretariat sent a forecast of contributions to the members together with the Estimated Budget. They should be considered as a preliminary reference.

12.8. The Committee recommended that when a substantial change in any country contribution is foreseen, that the pertinent country be notified as soon as possible and informed about this change.

Item 13. FINANCIAL STATUS OF THE SKIPJACK PROGRAM

13.1. The financial status of the Skipjack Program, which is estimated to the end of 1979, is reported in COM/79/14.

Item 14. REVIEW OF THE SPECIAL SKIPJACK BUDGET (1980-81-82)

14.1. The Convener of the Sub-Committee on Skipjack, Dr. G. Sakagawa, explained about the developments of the International Skipjack Year Program. He emphasized that the Sub-Committee felt that it is essential to increase the budget for 1980 through 1982 in order to carry out the Program effectively. This increase became necessary due to the high inflation experienced since the budget was prepared in 1977, the dollar devaluation and the austerity regular budget which was adopted by the Commission. The new proposed budget is attached herewith as Appendix 5. "The Sub-Committee considered that the Skipjack Program should sooner be totally abandoned than to have any portion of the newly-proposed budget cut."

14.2. The Committee realized the necessity of increasing the budget; however, some questions were raised on the proportionally higher increase for 1982, in particular, the item of salaries. It was explained that the original budget had no provision for the inflationary increase of wages. Besides, the Sub-Committee had found that more temporary personnel would be needed towards the end of the Program in order to prepare the report in the three languages of the Commission, and to compile the data.

14.3. The Committee reconfirmed that the Program should be executed by the effort of member countries but coordinated by the Commission. This is why the Program Coordinator was hired as an additional member of the current Secretariat staff.

14.4. In the Estimated Special Skipjack Budget, Section a) refers to field activities which may need some assistance from Commission funding while the coordination services are totally covered in Section b). The delegates of Canada and Portugal expressed their concern over the proposed increases in the budget, particularly on the salaries item.

14.5. The delegate from Brazil questioned the balance of the Program in terms of providing supplemental funding for the activities. He observed that Exploratory Fishing was one of the most important activities of the Program while it has no Commission budget for its execution. Therefore, all the exploratory fishing has to depend on member country matching contributions. In the western Atlantic the whole area is subject to exploratory fishing since no large-scale commercial fisheries exist. This leaves major doubt with the Brazilian government concerning participation in the Program since almost all the work has to be done by the government in addition to the increased budgetary contribution which the Brazilian government has to bear.

14.6. After some discussion on these points, the Brazilian delegate wished to clear these matters with the Convener of the Sub-Committee on Skipjack. Until this is done, he reserved his position concerning the Skipjack Budget.

14.7. In spite of objections from several countries, the Committee decided to recommend the adoption of the Revised Budget for 1980. At the beginning of the four-year Program in 1978, the Committee agreed to approve the budget as a whole but that the actual adoption should be made on a yearly basis; therefore, the Revised Skipjack Budget for 1981-1982 should be the subject of consideration of the Commission when it meets again in the future.

Item 15. REVIEW OF MEMBER COUNTRY CONTRIBUTIONS — SPECIAL SKIPJACK BUDGET (1980-81-82)

15.1. After some discussion, the Committee recommended to the Commission that the parameters used in calculating contributions at the 1978 meeting be applied to the calculations of 1980 through 1982. The reason is that if we use the latest catch, canning, and Panel membership data, the proportional increase of each country contribution is quite variable. This may lead to some difficulties for some countries to accept an increase.

15.2. The contributions calculated for the Revised Skipjack Budget using the old parameters are herewith attached as Appendix 6 and the Committee recommended that the Commission adopt the contributions with the conditions mentioned in 14.7.

Item 16. ESTABLISHMENT OF AN INFRACTIONS COMMITTEE

16.1. The Committee noted that the Commission suggested at its First Special Meeting in 1978 the establishment of an Infractions Committee. The Committee noted that a recommendation was made by the Working Group on International Inspection at its 1978 meeting to dissolve the Working Group and the Commission agreed with this recommendation. The Committee recommended that the Commission establish an Infractions Committee to replace the Working Group on International Inspection.

Item 17. DATE AND PLACE OF THE NEXT MEETING OF THE COUNCIL

17.1. The Committee recommended that in 1980 the Commission hold its Second Special Meeting, rather than holding a Council Meeting. This will enable the Commission

to review the Regular Commission Budget as well as the Special Skipjack Budget for the year 1981, with all new information on the exchange rate and the inflation rate available. In addition to these, the Committee noted that this will give the Commission an opportunity to review the progress made by the scientists and to follow up all the possible management recommendations resulting from such scientific studies.

Item 18. DATE AND PLACE OF THE NEXT MEETING OF THE COMMISSION

18.1. The Committee recommended to the Commission that the next Commission meeting be held during the week starting on November 12, 1980, in Madrid, Spain.

Item 19. OTHER MATTERS

19.1. The Committee noted that there was a request made by the Panels to reconsider the distribution of species among the Panels. A few countries expressed that they are in favor of moving the bigeye species from Panel 4 to Panel 1.

19.2. Spain, as Chairman of Panel 4, felt that moving bigeye from Panel 4 will result in a major reorganization of all the Panels. Besides, the Committee noted that the change of the species distribution among the Panels may cause a change in Panel membership which will then have an impact on the calculations of the member country contributions to the budget.

19.3. The Committee decided to ask the SCRS to conduct a study as to which Panel the bigeye tuna species would be most efficiently discussed from a biological standpoint. The SCRS Chairman noted that his Committee needs some time in which to conduct this study, since bigeye tuna has a tropical nature in its younger stage and is then the subject of the tropical surface fisheries while the habitat of the adult fish is temperate and the species is caught by longliners. The SCRS is asked to report the results of its studies at the 1980 meeting.

19.4. The Secretariat was asked again to carry out studies of the possible implications of moving bigeye from Panel 4 to Panel 1 and to prepare a document for presentation at the next meeting of the Commission.

Item 20. ELECTION OF COMMITTEE CHAIRMAN

20.1. Upon a motion made by Portugal and seconded by France, Mr. C. J. Blondin (U.S.A.) was unanimously reelected Chairman.

Item 21. ADOPTION OF REPORT

21.1. The Report was adopted.

Item 22. ADJOURNMENT

22.1. The Meeting was adjourned.

Appendix 1 to Annex 6

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

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 1978
9. Financial status 1979
10. Working Capital Fund
11. Estimated Regular Budget 1980-1981
12. Member Country Contributions 1980-1981
13. Financial status of the Skipjack Program
14. Review of the Special Skipjack Budget (1980-81-82)
15. Review of member country contributions--Special Skipjack Budget (1980-81-82)
16. Establishment of an "Infractions Committee"
17. Date and place of the next meeting of the Council
18. Date and place of the next meeting of the Commission
19. Other matters
20. Election of Committee Chairman
21. Adoption of Report
22. Adjournment

Appendix 2 to Annex 6

Panel Membership (as of November 14, 1979)

Country	*Panel 1*	*Panel 2*	*Panel 3*	*Panel 4*	*Total*
Angola	X	---	---	X	2
Benin	---	---	---	---	0
Brazil	X	---	X	---	2
Canada	---	X	---	X	2
Cape Verde	X	---	---	---	1
Cuba	X	---	---	X	2
France	X	X	---	---	2
Gabon	---	---	---	---	0
Ghana	X*	---	---	---	1
Ivory Coast	X	---	---	---	1
Japan	X	X	X*	X	4
Korea	X	X	X	X	4
Morocco	X	X*	---	---	2
Portugal	X	X	---	X	3
Senegal	X	---	---	---	1
South Africa	---	---	X	---	1
Spain	X	X	---	X*	3
U.S.A.	X	X	X	X	4
U.S.S.R.	X	---	---	X	2
TOTAL	15	8	5	9	37

*Panel Chairman.

Appendix 3 to Annex 6

Revised Regular Commission Budget 1980-81 (US $)

	1979 Budget (Approved by the Commission in 1977 and revised in 1978)	*Revised Estimation 1980*	*Revised Estimation 1981*
Total	*429,000*	*625,000*	*750,000*
CHAPTER			
1. Salaries	172,000	260,000	312,000
2. Travel	12,000	16,000	19,200
3. Annual meeting	43,000	58,000	70,700
4. Publications	22,000	30,000	36,600
5. Office Equipment	4,000	4,000	4,800
6. Gen. Operating Expenses	38,000	48,000	57,600
7. Miscellaneous Expenses	4,000	5,000	6,000
	295,000	421,000	505,200
8. Coordination of Research			
a) Personnel	88,000	130,000	156,000
b) Travel	11,000	14,000	16,800
c) Equipment	5,000	7,000	8,400
d) Data Processing	25,000	28,000	33,600
e) Meetings during the year* (Sub-committees, Working Groups, etc.)	....	20,000	24,000
f) Miscellaneous	5,000	5,000	6,000
	134,000	204,000	244,800
9. Contingencies	0	0	0
TOTAL	429,000	625,000	750,000
	(=36,465,000 Ptas. at 1 US $=85 Ptas.)	(=41,250,000 Ptas. at 1 US $=66 Ptas.) 12.6% increase in peseta value	(20 % increase over 1980 in $)

*New sub-chapter.

Table of Contributions by Member Countries

Year 1980 – Total Budget (K) $625,000

Country	*A* *No.*	*B* *%*	*C*	*D*	*E*	*F* *%*	*G* *$*	*H* *$*	*I* *$*	*J* *$*	*K* *$*
			..... (1,000 MT)								
Angola	2	5.36	8.60	2.30	10.90	2.04	1,000	2,000	10,161	7,752	20,912
Bénin	0	1.79	0.00	0.00	0.00	0.00	1,000	0	3,387	0	4,387
Brasil	2	5.36	3.00	0.10	3.10	0.58	1,000	2,000	10,161	2,205	15,365
Canada	2	5.36	1.10	0.30	1.40	0.26	1,000	2,000	10,161	996	14,157
Cap-Vert	1	3.57	1.00	0.30	1.30	0.24	1,000	1,000	6,774	925	9,699
Cuba.	2	5.36	10.10	1.20	11.30	2.12	1,000	2,000	10,161	8,036	21,197
France.	2	5.36	78.20	41.40	119.60	22.42	1,000	2,000	10,161	85,055	98,216
Gabon.	0	1.79	0.00	0.00	0.00	0.00	1,000	0	3,387	0	4,387
Ghana.	1	3.57	21.30*	0.00	21.30	3.99	1,000	1,000	6,774	15,148	23,922
Cote d'Ivoire . . .	1	3.57	16.40*	15.90	32.30	6.06	1,000	1,000	6,774	22,971	31,744
Japan	4	8.93	42.80	0.00	42.80	8.02	1,000	4,000	16,935	30,438	52,372
Korea	4	8.93	45.10	0.00	45.10	8.46	1,000	4,000	16,935	32,073	54,008
Maroc	2	5.36	5.10	3.50	8.60	1.61	1,000	2,000	10,161	6,116	19,277
Portugal.	3	7.14	9.20	8.60	17.80	3.34	1,000	3,000	13,548	12,659	30,206
Sénégal	1	3.57	3.80	2.50	6.30	1.18	1,000	1,000	6,774	4,480	13,254
South Africa. . . .	1	3.57	0.30	0.10	0.40	0.07	1,000	1,000	6,774	284	9,058
España	3	7.14	107.40	32.50	139.90	26.23	1,000	3,000	13,548	99,490	117,038
U.S.A..	4	8.93	26.30	25.10	51.40	9.64	1,000	4,000	16,935	36,554	58,488
U.S.S.R.	2	5.36	19.40	0.50	19.90	3.73	1,000	2,000	10,161	14,152	27,313
Total.	*37*	*100.00*	*399.10*	*134.30*	*533.40*	*100.00*	*19,000*	*37,000*	*189,667*	*379,333*	*625,000*

A – Panel membership.
B – Percentage of payments for annual membership and panel membership (G+H).
C – 1977 catch (live weight).
D – 1977 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 $569,000=(625,000 - 56,000 (G+H)) distributed percentage-wise according to column B.
J – 2/3 of $569,000=(625,000 - 56,000 (G+H)) distributed percentage-wise according to column F.
K – Total G+H+I+J).

*No reporting received by the Secretariat. Estimates by the Secretariat based on Statistical Bulletin Vol. 9 (Prel.) and National Reports.

Table of Contributions by Member Countries

Year 1981 – Total Budget (K) 750,000

Country	*A* *No.*	*B* *%*	*C*	*D* *..... (1,000 MT).....*	*E*	*F* *%*	*G* *$*	*H* *$*	*I* *$*	*J* *$*	*K* *$*
Angola	2	5.36	8.60	2.30	10.90	2.04	1,000	2,000	12,393	9,455	24,847
Bénin	0	1.79	0.00	0.00	0.00	0.00	1,000	0	4,131	0	5,131
Brasil	2	5.36	3.00	0.10	3.10	0.58	1,000	2,000	12,393	2,689	18,082
Canada	2	5.36	1.10	0.30	1.40	0.26	1,000	2,000	12,393	1,214	16,607
Cap-Vert	1	3.57	1.00	0.30	1.30	0.24	1,000	1,000	8,262	1,128	11,390
Cuba.	2	5.36	10.10	1.20	11.30	2.12	1,000	2,000	12,393	9,802	25,195
France.	2	5.36	78.20	41.40	119.60	22.42	1,000	2,000	12,393	103,740	119,133
Gabon.	0	1.79	0.00	0.00	0.00	0.00	1,000	0	4,131	0	5,131
Ghana	1	3.57	21.30*	0.00	21.30	3.99	1,000	1,000	8,262	18,475	28,737
Cote d'Ivoire . . .	1	3.57	16.40*	15.90	32.30	6.06	1,000	1,000	8,262	28,017	38,279
Japan	4	8.93	42.80	0.00	42.80	8.02	1,000	4,000	20,655	37,124	62,779
Korea	4	8.93	45.10	0.00	45.10	8.46	1,000	4,000	20,655	39,119	64,774
Maroc	2	5.36	5.10	3.50	8.60	1.61	1,000	2,000	12,393	7,460	22,852
Portugal.	3	7.14	9.20	8.60	17.80	3.34	1,000	3,000	16,524	15,440	35,963
Sénégal	1	3.57	3.80	2.50	6.30	1.18	1,000	1,000	8,262	5,465	15,726
South Africa. . . .	1	3.57	0.30	0.10	0.40	0.07	1,000	1,000	8,262	347	10,609
España	3	7.14	107.40	32.50	139.90	26.23	1,000	3,000	16,524	121,348	141,872
U.S.A..	4	8.93	26.30	25.10	51.40	9.64	1,000	4,000	20,655	44,584	70,239
U.S.S.R.	2	5.36	19.40	0.50	19.90	3.73	1,000	2,000	12,393	17,261	32,654
Total.	*37*	*100.00*	*399.10*	*134.30*	*533.40*	*100.00*	*19,000*	*37,000*	*231,333*	*462,667*	*750,000*

A – Panel membership.
B – Percentage of payments for annual membership and panel membership (G+H).
C – 1977 catch (live weight).
D – 1977 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 $694,000=(750,000 - 56,000 (G+H)) distributed percentage-wise according to column B.
J – 2/3 of $694,000=(750,000 - 56,000 (G+H)) distributed percentage-wise according to column F.
K – Total G+H+I+J).

*No reporting received by the Secretariat. Estimates by the Secretariat based on Statistical Bulletin Vol. 9 (Prel.) and National Reports.

Revised Special Budget for the International Skipjack Year Program[1] (US $)

	1979	*1980*	*1981*	*1982*	*Total[2]*	*Difference*
a) ACTIVITES						
Tagging with dart tags	0	60,000	15,000	10,000	85,000	0
	0	*60,000*	*15,000*	*10,000*	*85,000*	
Improved statistics and data collection	0	35,000	45,000	10,000	90,000	0
	0	*35,000*	*45,000*	*10,000*	*90,000*	
Biochemical Stock Identification (Genetics)	0	8,000	2,000	0	10,000	0
	0	*8,000*	*2,000*	*0*	*10,000*	
Sub-total	0	103,000	62,000	20,000	185,000	0
	0	*103,000*	*62,000*	*20,000*	*185,000*	
b) ICCAT COORDINATION SERVICES						
Salaries	30,000	58,440	80,500	99,010	267,950	+113,950
	30,000	*38,000*	*43,000*	*43,000*	*154,000*	
Office equipment & materials	0	3,400	5,000	5,000	13,400	+ 1,400
	0	*2,000*	*5,000*	*5,000*	*12,000*	
Trip expenses	5,000	8,000	13,000	8,000	34,000	+ 9,000
	5,000	*5,000*	*10,000*	*5,000*	*25,000*	
Operation expenses and contracts	7,000	13,000	17,000	15,000	52,000	+ 3,000
	7,000	*12,000*	*15,000*	*15,000*	*49,000*	
Sub-total	42,000	82,840	115,500	127,010	367,350	+127,350
	42,000	*57,000*	*73,000*	*68,000*	*240,000*	
GRAND TOTAL	42,000	185,840	177,500	147,010	552,350	+127,350
	42,000	*160,000*	*135,000*	*88,000*	*425,000*	*(+23%)*

1 Budget proposed in 1977 and approved in 1978 is shown in italics.
2 The total does not include 1979 (i.e. old approved budget for 1979+ new budgets for 1980-1982).

Member Country Contributions for the Revised Special Skipjack Budget (US $)

Country	*1979*	*1980*	*1981*	*1982*	*Total Original*	*Revised*	*Difference*
Angola	850	3,762	3,594	2,976	8,604	11,182	2,578
Benin	246	1,087	1,038	860	2,486	3,231	745
Brazil	820	3,629	3,466	2,871	8,298	10,786	2,488
Canada	1,036	4,585	4,379	3,627	10,486	13,627	3,141
Cuba	1,443	6,383	6,096	5,049	14,597	18,971	4,374
France	6,828	30,214	28,858	23,901	69,096	89,801	20,705
Gabon	246	1,087	1,038	860	2,486	3,231	745
Ghana	1,371	6,068	5,796	4,800	13,876	18,035	4,159
Ivory Coast	1,388	6,143	5,868	4,860	14,049	18,259	4,210
Japan	3,984	17,628	16,837	13,945	40,314	52,394	12,080
Korea	4,276	18,919	18,070	14,966	43,268	56,231	12,963
Morocco	1,116	4,938	4,716	3,906	11,292	14,676	3,384
Portugal	1,928	8,532	8,149	6,749	19,511	25,358	5,847
Senegal	1,055	4,666	4,457	3,691	10,673	13,869	3,196
South Africa	510	2,258	2,156	1,786	5,163	6,710	1,547
Spain	8,212	36,338	34,708	28,746	83,102	108,004	24,902
U.S.A.	4,797	21,223	20,271	16,789	48,536	63,080	14,544
U.S.S.R.	1,894	8,379	8,003	6,629	19,163	24,905	5,742
TOTAL*	42,000 (42,000)	185,839 (160,000)	177,500 (135,000)	147,011 (88,000)	425,000	552,350	127,350

* The figures in parentheses are the original totals.

Annex 7

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

Madrid, November 7-13, 1979

Table of Contents

Item 1. Opening of the Meeting

The Chairman, Mr. A. Fonteneau (France), opened the Tenth Regular Meeting of the Standing Committee on Research and Statistics (SCRS). The Chairman asked the attendants to observe a moment of silence in memory of Mr. A. Champagnat, a French scientist who participated in ICCAT work. Mr. Champagnat died during 1979.

Mr. Fonteneau welcomed all the attendants. He recognized the remarkable progress made by the Commission in the ten years of its existence. He noted that the achievements of the Commission were brought about by progress in research and he congratulated both the scientists and the Secretariat. He stated his concern, on the other hand, about the persistent problems of the last few years regarding the inadequacy of statistics for some of the fleets. The scientists were asked to give serious thought to the solution of these problems. The Chairman also stressed the importance of good communication between SCRS scientists and commissioners and asked the scientists to keep this in mind when writing their reports.

The Executive Secretary of the Commission extended a warm welcome to all the attendants and thanked the SCRS Chairman and all the scientists for their continuous assistance and collaboration with the Secretariat throughout the year. He noted that 1979 is the tenth anniversary of the Commission and commended the excellent work and leadership demonstrated by the SCRS Chairmen, namely, the Messrs. Valdez, Rothschild and Fonteneau.

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

Item 2. Adoption of Agenda and arrangements for the meeting

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

The following scientists were appointed rapporteurs for Item 12 of the SCRS Report, "Status of stocks":

12-a Yellowfin	G. Sakagawa*, R. H. Pianet, A. L. Coan A. Fernández
12-b Skipjack	R. H. Pianet*, G. Sakagawa, A. L. Coan, A. Fernández
12-c Bluefin	M. L. Parrack*, C. Shingu, H. Farrugio, J. L. Cort, T. D. Iles
12-d Albacore	F. X. Bard*, N. Bartoo, J. Y. Le Gall
12-e Bigeye	S. Kume*, Al. Santos Guerra, W. Parks
12-f Billfishes	R. Conser*, C. Shingu
12-g Southern bluefin	C. Shingu*
12-h Small tunas	M. Farber*, P. Miyake

Dr. P. M. Miyake (Secretariat) was nominated rapporteur for all the other Agenda items, and Dr. G. Sharp (FAO) was asked to serve as the coordinator of rapporteurs.

An *ad hoc* Working Group on Admission on SCRS Documents was established and the Messrs. Beckett (Canada-Chairman), Negreiros Aragao (Brazil), Amon Kothias (Ivory Coast) and Rey (Spain) were asked to review the qualifications of submitted documents.

Item 3. Admission of observers

All the observers (listed in Annex 2 to the Proceedings) were introduced, admitted and welcomed to the SCRS session.

Item 4. Admission of scientific papers

Mr. J. S. Beckett reported on the results of the meeting of the Ad Hoc Working Group on Admission of SCRS Documents.

His group studied all the scientific reports submitted to the SCRS in 1979. The

* Chief Rapporteur.

group noted that documents SCRS/79/50 and SCRS/79/106 were withdrawn and that SCRS/79/110 was the only paper which did not satisfy any of the criteria for acceptance of documents. The group recommended to the Committee that document SCRS/79/110, therefore, not be accepted for the 1979 SCRS session, but that it should be made available to everyone and be included in the 1980 SCRS documents.

The group also noted that 60 copies for late arriving documents are no longer satisfactory to secure full distribution to all the attendants, and that probably 80 copies would be needed. The Assistant Executive Secretary also confirmed that 80 copies would secure full distribution, including observers.

The Committee agreed on these points and decided that from 1980 on those papers not submitted within the one month advance deadline should be accompanied by 80 copies. The List of Documents accepted at the 1979 SCRS Meeting is attached as Appendix 2.

Item 5. Report of the SCRS Officers Meeting

The Report (COM-SCRS/79/23), was presented to the Committee by its rapporteur, Dr. P. M. Miayke (Secretariat). The Officers Meeting was held, together with the meeting of the Sub-Committee on Skipjack, on July 26-28, 1979, at Las Palmas, Canary Islands, Spain. The officers reviewed the progress made by the SCRS scientists and the Secretariat, as well as the progress made in the completion of the assignments made at the 1978 SCRS Meeting. Those assignments included subjects such as the International Skipjack Year Program, the Working Group on Juvenile Tropical Tunas, the Bluefin Workshop, the Working Group on Data Management, etc. The officers also reviewed the organization of the 1979 SCRS Meeting with respect to the procedures to be adopted, rapporteurs reporting, agenda, document policy, etc. Inter-sessional meetings foreseen for 1980 were also the subject of discussion.

The Committee recognized that the meeting was productive and that such an inter-sessional review of progress helps the SCRS in completing its assignments.

The Committee recognized that one of the suggestions made at the SCRS Officers Meeting was to establish a working group to study the overall organization of the SCRS meeting. The SCRS Chairman decided to establish a Working Group on SCRS Organization and nominated the following members to serve on this Group: N. Bartoo (U. S.-Convener), G. Sharp (FAO), R. Letaconnoux (France), J. S. Beckett (Canada) and P. M. Miyake (Secretariat). The Group was instructed to meet during the Committee's sessions and report the results of their studies to the SCRS. The terms of reference given to the Group were that alternative procedural systems should be compared carefully, particularly referring to various procedures adopted by other international fisheries organizations. The Group should also identify the special needs of ICCAT and present the advantages and disadvantages of each alternative system.

Item 6. Report of the Working Group on Juvenile Tropical Tunas

The Report of the ICCAT/CECAF Joint Working Group on Juvenile Tropical Tunas (COM-SCRS/79/26) was presented by Dr. P. M. Miyake in the absence of Mr. M. A. Mensah, the Convener of the Group. This Working Group met in Abidjan on September 17-21, 1979.

Item 8. Review of progress made on assignments for juvenile tropical tuna studies

The Working Group Report (COM-SCRS/79/26) was reviewed by the Committee. The Committee recognized that considerable progress was made by the Working Group in analyzing basic data. Two important recommendations were made:

"1. ICCAT provide funds for the development of an Atlantic Ocean-specific bioeconomic model for the tropical tuna fisheries;

2. The individual member countries (France, Ivory Coast, Morocco, Spain, Korea, Ghana, Japan, U.S.A.) operating in the juvenile tropical tuna fisheries of the eastern Atlantic should evaluate the operating costs of their fleets for input into the bioeconomic model."

The Committee also noted that a recommendation was made by the Group that "the ICCAT organize a second working group meeting on the stock assessment and management of stocks related to the juvenile tropical tunas in the first half of 1980."

The Committee felt that the decision on these three points has to be made after other items are discussed. With these reservations, the Committee concurred with all the recommendations made by the Working Group and adopted the report. (The Report is found in the "Collective Volume of Scientific Papers, Vol. X".)

Item 7. Report of the Bluefin Workshop

The Report of the Bluefin Workshop, which was held in Santander, Spain, on September 3-8, 1979 (COM-SCRS/79/25) was presented to the Committee by Mr. S. Kume (Japan) - in place of the Chairman, Mr. Z. Suzuki.

While reviewing the Report, the Committee noted that the problems of the basic data have been or are being solved. There are still some problems of lack or inadequacy of data for some fisheries and the Committee recommended that the pertinent scientists and the Secretariat look into the problems and solve them as soon as possible.

Among the many recommendations made by the Group, there were three on which the Committee could not make a decision at this time. Those were as follows:

1) That sufficient resources be made available to the Secretariat to accomplish catch sampling and data collection from the fisheries for which data are missing, to create, update and maintain the central data bases for bluefin;

2) That a group of scientists to work on bluefin tuna stock evaluation be established; and

3) That an inter-sessional meeting be held in mid-1980 to evaluate population status.

The Committee decided to keep these recommendations in mind while dealing with other Agenda items, such as stock evaluation, Sub-Committee on Statistics, etc. With this understanding, the Committee concurred with all other recommendations and adopted the report. (The Report is included in the "Collective Volume of Scientific Papers, Vol. XI".)

In response to a question raised, the Assistant Executive Secretary stated that the descriptions of all bluefin fisheries in the Atlantic, which were prepared and assembled for the Workshop, are very valuable documents and that the Workshop scientists have asked that these be published in one volume. The Secretariat is trying to revise and complete them and will publish them in the near future as one volume of the "Collective Volume" series (such as the Report of the Nantes Workshop), if funds are available. This proposal was supported by the Committee.

Item 9. Report of the Sub-Committee on Skipjack

The Report of the Meeting of the Sub-Committee on Skipjack (COM-SCRS/79/24) was presented by the Sub-Committee Convener, Dr. G. T. Sakagawa (U.S.A.). He summarized the discussions of the Sub-Committee meeting held in July at Las Palmas and mentioned that the Report had to be presented now to the Committee, but will be subject to discussion by the Sub-Committee.

Besides, some editorial changes have to be introduced to the Report. Therefore, the final version of the Report will be made available in the very near future.

The Committee congratulated the excellent work in generating a complete program plan demonstrated by scientists and the Sub-Committee Convener. The Committee accepted the Report with the understanding that the contents would be reviewed in detail under Agenda item 10.

The ICCAT Skipjack Coordinator, Dr. P. E. K. Symons, commented on the work he has been involved with since his incorporation with the Secretariat. He mentioned several public relations programs he has been developing, including drafting leaflets.

Item 10. Review of the Skipjack Year Program

The results of the meeting of the Sub-Committee on Skipjack, which met during this SCRS session, were presented by its Convener, Dr. Sakagawa (U.S.A.). The Report is herewith attached at Appendix 3. The Committee recognized that the program plan presented under Item 9 was again reviewed by the Sub-Committee on Skipjack.

As no major changes were proposed to the program plan, the Committee adopted the Report of the Canary Islands meeting (COM-SCRS/79/24), with the understanding that editorial changes would be made in the near future.

While adopting the Report, the Committee specifically requested the attention of the Commission to the revised budget proposed by the Sub-Committee. The need to

increase the budget for coordination services has arisen because:

1) Preliminary budget estimates prepared by the Skipjack Working Group in mid-1977 were reduced at the 1977 SCRS-Commission Meeting with the understanding that the regular budget would be approved. However, the regular budget was also cut.

2) Inflation has increased costs considerably since the budget was first adopted in 1977.

3) The value of the U.S. dollar on which the budget is based has declined relative to other currencies in which program costs are incurred.

"The Sub-Committee stresses that any reduction in the total of the proposed budget would reduce activity budgets ("a") rather than the Coordination Services budget ("b") because the latter contains absolutely necessary expenses for continuing the Program. Any reduction in the total allotment would result in curtailing or dropping one or more of the activities. However, since each activity is closely interrelated with the others, failure of one activity would lead subsequently to the failure of the whole Program with wastage of the entire investment. Therefore, *the Sub-Committee considers that the Skipjack Program should sooner be totally abandoned than to have any portion of the newly-proposed budget cut."* (Com–SCRS/79/24). The Committee fully reiterated these views expressed by the Sub-Committee and asked the Commission to give very serious consideration to this proposed new budget.

The Committee shared the concern expressed by the Sub-Committee on funding, as cash will not be available until March, 1980, in order to purchase the materials needed for early 1980. The Committee requested the Commission to pay special attention to this problem.

The Committee also noted that needs specified for the exploratory fishing proposed for the western Atlantic have not been adequately met by matching contributions. The Committee pointed out that the failure of this activity may seriously hamper the rest of the Program, and requested the Commission and Sub-Committee to seek a solution.

The Committee approved the new Activity Teams formed by the Convener.

The Committee recognized that there is a need of an inter-sessional meeting of the Sub-Committee on Skipjack in early 1980 and requested the Commission to approve such a meeting. The exact date and location will be determined at a later date by communication.

The Committee also noted that the Sub-Committee will have to meet in 1981 and 1982, during the inter-sessional period and requested member countries to secure funds for the concerned scientists' attendance.

Item 11. Review of national fisheries and research programs

11.1 ANGOLA

Angola has been carrying out biological sampling, fishery data collection and oceanographic surveys. All the statistics required have been presented to the ICCAT and these will be continued during the next year. Besides, Angola is planning to improve statis-

tics on major species. For the Skipjack Program, Angola has very limited resources to contribute to the Program, except for conducting some intensive sampling.

11.2. BENIN

No report was submitted.

11.3. BRAZIL

Tuna fishing in Brazil has been carried out by a fleet comprised of five national longliners and five leased Japanese longliners. These vessels all operated in the south-east-south area. Only three of the leased Japanese longliners operated effectively. Also included are the artisanal fisheries in the northeast. For the first time this year rod and reel fishing was conducted in Rio de Janeiro by a small fleet of sardine vessels especially adapted for this purpose. The yields obtained are quite promising. The catches are comprised basically of skipjack (50 percent), blackfin and yellowfin.

The 1978 catches experienced an increase in relation to the previous year. This was due to a slight increase in longline catches and possibly to better coverage of the artisanal landings, totalling close to 6,500 MT, as compared to 4,600 MT in 1977. We anticipate another increase in 1979 and expect that the total catch will exceed 7,000 MT, due to the introduction of rod and reel fishing.

With regard to research, no substantial progress was observed. However, biostatistical studies of the catches of the national longliners based in Santos were continued. As a result of these studies, various papers were presented to the SCRS. We also tried to continue the studies of the artisanal fisheries in the northeast. Collection of statistical data from the catches of the leased vessels is also being carried out, based on the log-books. These studies are basically an analysis of effort and yield of the various fishing areas.

11.4. CANADA

Tuna catches in 1978 totalled 1,074 MT, with 241 MT juvenile bluefin, 318 MT yellowfin and 86 MT skipjack taken by purse seine off the U.S. east coast and 429 MT of large bluefin taken by various methods in Canadian waters. The bluefin catches were 30 percent below those in 1977 and preliminary data for 1979 indicate a further decrease to perhaps 300 MT due to a decision not to enter the purse seine fishery for school bluefin and to environmental factors apparently affecting distribution and availability of large fish. Swordfish catches are increasing with 2,314 MT taken in 1978 and over 3,000 MT in 1979 in response to a change in 1979 in the mercury content regulations.

Bluefin catches were sampled extensively for length and otolith samples, while weights were obtained for most large individuals. The impoundment of large bluefin for fattening prior to sale provided a continued opportunity to study behavioural and physiological parameters using telemetric devices, and to investigate age validation, tag retention, parasitology, tissue contamination and electrophoretic characteristics. Data

from log records in the rod and reel fisheries were analyzed and preliminary results indicate declining CPUE's. Swordfish investigations were restarted in 1979, with the introduction of new logbooks, catch sampling, and the deployment of observers on commercial vessels.

Tagging continues to produce valuable data, including a swordfish recaptured in the Straits of Florida and one bluefin in the Caribbean and another in the Gulf of Mexico.

11.5. CAPE VERDE

No report was submitted.

11.6. CUBA

Cuban tuna fisheries in 1979 are showing similar characteristics to those of the previous year, i.e. 1978. The total catch reached 9,200 MT. This figure shows a decrease in Cuban tuna catches in the Atlantic Ocean, which during the last six years have been slightly above 10,000 MT.

The Cuban tuna fishing fleet ("Flota Atunera de Cuba" - F.A.C.) was comprised of 24 longline vessels and 1 purse seiner, whose area of operation was fundamentally 15ºN to 10ºS latitude, and approximately 60ºW longitude to the African coasts. The fleet, which operated in the area corresponding to the Cuban flat, almost exclusively fished skipjack and was comprised of 74 baitboat vessels.

During 1978 and part of 1979, monthly biological sampling has been carried out in all skipjack fishing areas. Besides, catch and effort data have been collected from all Cuban vessels engaged in skipjack fishing. Presently, we are working to improve the statistics of skipjack caught in the Cuban flat area. The objective of this work is to initiate activities in line with future tasks planned for the International Skipjack Year Program.

11.7. FRANCE

In 1978, French catches amounted to 74,400 MT of which 58 percent were intertropical species.

Three research vessels participated in scientific work to study these fisheries (exploration, sampling, tagging, biology and ecology of the main species was conducted). Moreover, a number of samples have been collected in the ports, with special emphasis on Mediterranean bluefin. The results of this work, as well as those of the population dynamics studies based on it, have been presented to ICCAT.

11.8. GABON

No report was submitted.

11.9. GHANA

Collection of statistical and biological data has continued in earnest both in port and on-board vessels at sea. A program of on-board sampling to observe dumping and composition of species that was initiated in 1978 continued in the year now in review.

Biological studies on skipjack tuna have been intensified on-board vessels and in the cannery. Landings have generally been sporadic due to heavy rains which have somehow affected bait catching as well.

On the whole, catches for the first nine months of 1979 have been lower than for the same period last year.

11.10. IVORY COAST

Landings were regularly monitored. A great amount of information is available for the FIS fleet and has been transmitted to ICCAT. The first two quarters of 1979 indicate a sharp decrease in landings: 19,670 MT, as compared to 27,270 MT in 1978. Even though there was a one-month fishing strike, this decrease in a source of concern.

Ivory Coast is aware of the importance of tuna statistics and is continuing its work in this area. The CRO-Abidjan will increase its scientific staff in order to optimize data collection and processing and to better undertake its responsibility for the "Improved Fishery Statistics" activity of the Sub-Committee on Skipjack. CRO researchers are also collaborating in the "Tagging" activity. Special emphasis will be given to surveys of Spanish tuna vessels in collaboration with the "Instituto Español de Oceanografía".

Spawning and larvae studies will continue.

11.11. JAPAN

Japanese Atlantic tuna fisheries in 1978 harvested 39,000 MT of tuna and tuna-like fishes by two types of gears, longline and baitboat. The catch level has been approximately the same since 1975. The longline catch amounted to 21,800 MT and its major species were bigeye (10,500 MT), southern bluefin (4,900 MT) and bluefin (3,000 MT) tunas, the combined catch of which accounted for 84 percent of the total longline catch. The baitboat fleet operating in the Gulf of Guinea caught 17,200 MT, 85 percent of which was skipjack.

During 1978-1979, fisheries data (Task I, Task II and biological sampling) were routinely collected from the Japanese Atlantic fisheries, and presented to SCRS as requested. Data collection for detailed statistics by school on the baitboat fishery has been progress. Studies on fisheries biology and stock assessment were continued and the results were presented to the SCRS in nine documents. In 1979, additional research was conducted for the International Skipjack Year Program, the Bluefin Workshop and the Working Group on Juvenile Tropical Tunas.

11.12. KOREA

In 1978, the Korean commercial catches of tuna and tuna-like fishes from the Atlantic Ocean amounted to 39,458 MT, of which 29,094 MT were caught by 97 longline vessels and 10,364 MT by 20 baitboat vessels. The major species of the catch were yellowfin, bigeye, skipjack and albacore.

Although field research on Korean tuna fishing in the Atlantic Ocean was not carried out in 1978 and 1979, statistical work on catch and effort data and biological data from commercial fishing vessels has been carried out as in previous years.

11.13. MOROCCO

No report was submitted.

11.14. PORTUGAL

No report was submitted.

11.15. SENEGAL

In 1978 the tuna fleet based at Dakar (29 baitboats and 6 purse seiners) landed 14,150 MT of tuna (4,300 MT of yellowfin, 6,250 MT of skipjack and 3,600 MT of bigeye). This indicates an increase (+20 percent) as compared to 1977 landings. The first estimates for Dakar tuna fishing in 1979 show an approximate decrease of 40 percent. This is due, in great part, to a decrease in the skipjack catch.

In 1978, tuna transshipments at Dakar (19,600 MT) by the FISM (12,000 MT) and Spanish (7,600 MT) fleets have decreased (- 50 percent) as compared to 1977.

The major studies carried out by CRODT are the following:

- Collection of biostatistical data, processing and updating of FISM data.
- Study of reproduction and fecundity of skipjack exploited by the Dakar fishery (results to be published in 1980).
- Skipjack growth study based on sections of the first dorsal fin (results to be published in 1980).
- Exploitation and biology studies of small tunas (in particular, *Euthynnus alletteratus*) and tuna-like species (*Scomberomorus*).
- Considerable participation in the Skipjack Program (growth, reproduction and tagging), as well as in the preparation for the Working Group on Juvenile Tropical Tunas (Abidjan, September, 1979).

11.16. SOUTH AFRICA

No report was submitted.

11.17. SPAIN

The coverage rate for Task II statistics for the Gulf of Guinea fisheries, which was approximately 30 percent in 1978, increased to 50-60 percent for the same year, due to the data collection at the ports of Dakar and Abidjan. It is hoped that the coverage rate increases even more for 1978 and 1979 and that the processed data corresponding to 1980 become available within the established time limits.

Collection of Task I, II and biological data continued for the Canary Islands. Skipjack tagging cruises were carried out in the last quarter.

For albacore and bluefin tuna in the Iberian peninsula and the Canary Islands, activities were maintained at the same level as those of previous years. During the summer of 1979, bluefin tuna tagging experiments using baitboat vessels were carried out in the Bay of Biscay.

There were no changes in swordfish from the Iberian peninsula from previous years.

Research work on small tunas in the Iberian peninsula was limited to tagging and the study of biological parameters for some small tuna species (*Sarda sarda*, *Auxis* and *Euthynnus alletteratus*) in the traps off the Strait of Gibraltar. Three cruises were conducted during the 1978-79 period.

During the summer of 1979, a research cruise, in collaboration with Italian scientists, was carried out for tuna eggs and larvae in the area to the southwest of Italy.

11.18. UNITED STATES

United States commercial catches of Atlantic tunas and tuna-like fishes in 1978 increased 13 percent from 26,270 MT in 1977 to 29,572 MT in 1978. Tropical tuna catches increased 35 percent from 13,771 MT to 18,600 MT. Bluefin tuna catches decreased 5 percent from 1,956 MT to 1,852 MT.

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

United States research activities in 1978-1979 included life history, stock identification, stock assessment, fishery evaluation and basic biology investigations.

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

11.19. U.S.S.R.

No report was submitted.

11.20. TAIWAN

The total Atlantic catch of Taiwan's longline tuna fleet in 1978 was 37,800 MT. It was 36,700 MT in the previous year, 1977; so, there was an approximate 1,000 MT increase in 1978. According to landing statistics, the preliminary estimate for the 1979 total catch, up to September, is 27,900 MT.

The albacore catch in 1978 was 29,800 MT, almost the same as that of the previous year. The preliminary estimate of the albacore catch for 1979 is 22,800 MT.

The coverage rate of logbooks increased significantly from 14 percent and 20 percent for 1976 and 1977, respectively, to 30.5 percent for 1978.

A document on the distribution of fishing effort and the albacore catch by the Taiwanese fleet in the North and South Atlantic was presented to this meeting. For some additional information about Taiwan's fishery, please refer to SCRS/79/28.

Item 12. Review of conditions of stocks, with a brief presentation of major papers on this subject

12-a YELLOWFIN

a-I. Review of current research

Several documents containing new research findings were presented to the Committe. Documents SCRS/79/14, 26, 52, 54, 61, 66, 105 and 109 reviewed fishing statistics and discussed problems associated with the reported catches of yellowfin tuna, particularly with respect to (1) misidentification of yellowfin and bigeye tuna, (2) eastern and western separation of the longline catch, and (3) discards of small yellowfin tuna. Effort and catch-per-unit-effort trends were analyzed in documents SCRS/79/30, 52, 54, 61, 66, 80, 92, 102, 103, 104, 109 and 116. Research related to stock structure of Atlantic yellowfin tuna was presented in documents SCRS/79/14, 49, 87 and 109-b and population parameters, such as growth, fecundity, and maturity were analyzed in documents SCRS/79/29, 31, 37 and 51. The condition of the yellowfin tuna stocks was described in documents SCRS/79/52, 54, 92, 104 and 109-a. Documents SCRS/79/61 and 85 analyzed the areal and seasonal distributions of catches by the tropical tuna fleets in an attempt to identify alternative management schemes for the protection of small yellowfin tuna. Documents SCRS/79/30, 52, 54, 66, 103, 105 and 115 provided detailed information on Atlantic yellowfin tuna fisheries.

a-II. REVIEW OF FISHERIES DATA

a-II.1. Catch trends

Yellowfin tuna catch statistics for the various fisheries in the Atlantic Ocean by gear, year and area are shown in Table 1. Adjustments to the yellowfin catches and bigeye catches of the Tema-based and Spanish fleets were applied to correct for misidentification of yellowfin and bigeye tuna in 1969 to 1978 (see footnotes to Table 1). The adjustments were based on information provided in document SCRS/79/26.

Discardings of small yellowfin tuna by the Tema-based fleet were 1,655 MT in 1977 and 6,650 MT in 1978 (SCRS/79/26, 102 and 116). These estimates were not included in Table 1.

The fisheries for yellowfin tuna in the Atlantic Ocean are divided into three components, (1) a longline fishery operating Atlantic-wide in the tropical area, (2) an eastern Atlantic surface fishery and (3) a western Atlantic surface fishery. The total Atlantic catch of yellowfin tuna increased from 61,800 MT in 1966 to a record high of 137,900 MT in 1978. The best estimate of the 1979 catch is 124,000 MT.

The longline catch during the period 1966 to 1978 has held relatively constant at an average of 26,000 MT; the highest catch was in 1973, 31,600 MT and the lowest in 1967, 17,200 MT. The best estimate of the 1979 longline catch is 25,000 MT. Documents SCRS/79/14 and 109-a review the separation procedure of the longline catches into eastern Atlantic and western Atlantic components. Results in the documents differ to some extent, although the differences are not very large.

The eastern Atlantic surface fishery catch has trended upward from 34,700 MT in 1966 to a record high of 109,900 MT in 1978. The best estimate of the 1979 catch is 96,300 MT. Baitboat catches have fluctuated between 9,400 MT and 12,900 MT since 1974. Baitboat catches continue to represent about 10 percent of the total surface catches in the eastern Atlantic. Purse seine catches in the eastern Atlantic continue the upward trend which began with 29,800 MT in 1966 to a record high of 98,300 MT in 1978. Increases in catches during the period 1975 to 1978 are related to expansion of the fishery into more offshore areas (SCRS/79/92, 104 and 109-a). Catches from the offshore area currently represent from 20 to 40 percent of the total eastern Atlantic surface catch and the catches are mainly of large fish.

Surface catches from the western Atlantic surface fishery remain small, averaging 2,000 MT during the period 1972-1978. The best estimate of the 1979 catch is 2,900 MT.

a-II.2. Effort trends

The estimated carrying capacity of the eastern tropical surface fleets is shown in Table 2.

Fishing effort for various longline fisheries in the eastern and western Atlantic and total Atlantic was presented in several documents examined by the Committee. The estimates of effort were generated from nominal hooks, catches and hook rates (SCRS/79/30, 54, 92 and 109). In general, all estimates for the total Atlantic show the same

trend (Fig. 1), which is a sharp increase during 1956 to 1965, a decrease during the mid-1960's and an increasing trend since then. Longline fishing effort in general is expected to show a modest decrease in 1979, as some vessels withdraw from the Atlantic Ocean. The trend in longline fishing effort in the eastern Atlantic shows a sharp increase during 1956 to 1961 and a somewhat stable condition since then, whereas effort in the western Atlantic has been relatively stable at a high level since about 1970 (SCRS/79/109-a).

Estimated effective fishing effort (total catch ÷ CPUE for the FIS fleet) was computed for the total surface fishery of the eastern Atlantic. The estimates differed in magnitude because of differences in catches used (SCRS/79/92, 104 and 109-a), but they all trend in the same way, upward in 1967 to 1978. This trend can also be seen in the carrying capacity of the surface fishery (Table 2). The estimated fishing capacity in 1979 should decrease slightly due to decreased American participation.

a-II.3. Catch rate trends

Estimates of longline CPUE for the yellowfin tuna fisheries were presented in documents SCRS/79/54 and 109-a. In general, all estimates show a decreasing trend (Fig. 2) with the CPUE in recent years about 50 percent lower than that in the mid-1960's. Longline CPUE's for the eastern and western Atlantic also show this decreasing trend although in 1978 the CPUE increased slightly (SCRS/79/109).

Estimates of CPUE for the eastern Atlantic surface fishery were presented in documents SCRS/79/92, 104 and 109-a. Document SCRS/79/92 estimated a type 1 CPUE from catch-effort data which were adjusted for effort expended on skipjack tuna using a catch criterion of 50 percent.

Documents SCRS/79/92, 104 and 109-a estimated a type 2 CPUE from catch-effort data which adjusted for time-area concentrations of fishing effort in the eastern tropical Atlantic, and for effort expended in areas of mainly skipjack tuna based on sea surface temperature (SCRS/78/86 and SCRS/78/70). Because of slight differences in methodology used in SCRS/79/92, 104 and 109-a, different type 2 CPUE's were computed. Despite the differences in methodology used, however, the three estimates show a downward trend for the period 1964-1978 (Fig. 3). In 1979, the Committee expects the CPUE to decline further as preliminary data for the fishery show a 20-28 percent reduction in nominal CPUE for all classes of purse seiners in the FIS fleet and an 8 percent reduction in type 2 CPUE.

It is evident from this discussion that a number of CPUE indices have been developed to index the abundance of the yellowfin tuna stocks. Some indices are quite different and the differences may be a reflection of real differences in abundance of fish of different sizes or in different areas which the index may be measuring rather than a reflection of the overall stock abundance. Bias from various sources also affects the estimates. Because at this time there is no clear reason for choosing among the various indices a best estimate and because the indices show a similar general trend, the Committee has used all of them in this year's assessment.

a-III. STOCK STRUCTURE

Two documents presented new information on yellowfin spawning distribution.

Document SCRS/79/37 presented gonad indices for yellowfin tuna caught in the Gulf of Guinea by surface gears. Document SCRS/79/109-b analyzes the seasonal cycle of gonad development in yellowfin tuna caught by the Japanese longline fleet. This latter document showed peak spawning occurring in the eastern Atlantic from February to May and in the western Atlantic from August to October. Data from surface gears show that yellowfin tuna probably spawn from December to March in the Gulf of Guinea.

Three documents analyzed larval data collected from various areas of the Atlantic. Data presented to the Committee summarized three research cruises carried out in the Gulf of Guinea during a period of yellowfin tuna spawning. In the area off Ghana and Sierra Leone during the first quarters, a large number of yellowfin larvae were collected during the cruises. The occurrence of yellowfin larvae during the first quarter is in agreement with the results reported in SCRS/79/37.

Document SCRS/79/49 presented larvae catches recorded during cruises conducted by Japanese scientists in the inter-tropical Atlantic from 1959 to 1971. Two-hundred thirty-eight yellowfin larvae were collected. Major catches were made off Brazil. Fewer numbers were collected in the eastern Atlantic. Unfortunately, the relative significance of east and west areas for yellowfin tuna reproduction cannot be compared with the available data.

Document SCRS/79/87 presented results of two research cruises carried out by American scientists in the Gulf of Mexico to study tuna larval distribution. Yellowfin tuna larvae could not be distinguished from blackfin tuna larvae, but it appears that they occur in the Gulf of Mexico at a relatively low abundance as compared to that for skipjack larvae.

Based on these results and those of previous studies, it can be concluded that yellowfin spawning occurs throughout the inter-tropical Atlantic. The important areas of spawning appear to be off Brazil and in the Gulf of Guinea.

Document SCRS/79/109-b presented various hypotheses about yellowfin tuna migration. The hypotheses were based on analysis of CPUE data from surface and longline fisheries. The abundance index of yellowfin derived from longline data usually reaches a maximum in March in the eastern Atlantic, and in September in the western Atlantic. Two CPUE maxima were observed during the same periods in the central Atlantic. These results can be interpreted as a seasonal effect of stock availability (for example, in relation with spawning), an east-west migration of at least part of the stock, or the effect of both these factors. The interaction between adults caught in the longline fishery and the surface fishery, however, is still uncertain. Based on previous information available to the Committee, it seems that segregation occurs between "longline" fish and "surface" fish with some mixing between them.

The Committee continues to feel that there are probably separate stocks in the Atlantic Ocean. Until there is clearer evidence for separating the stocks along better stock boundaries, the Committee will continue to conduct the assessments by using the two assumptions, as in the past, (1) a single Atlantic-wide stock and (2) two stocks separated by 30°W longitude. A more complex population structure is conceivable, but difficult to consider without further investigations of this important topic. The stock structure is complex, in light of the several regional fisheries, longline and surface; with this information it is clear that more study is necessary to define the stock structure.

a-IV. POPULATION PARAMETERS

Five documents presented various information on the population biology of yellowfin tuna. Document SCRS/79/29 analyzed the sex ratio of yellowfin tuna caught by Cuban longline vessels in the central Atlantic. The results confirmed past analyses showing that the longline catch of yellowfin tuna between 125 cm and 160 cm is predominantly males and fish over 160 cm are all males. Several hypotheses, in particular, availability, differential mortality and growth have been mentioned as explanations for this phenomenon.

Document SCRS/79/31 presented results of stomach contents analysis of yellowfin tuna caught by the Cuban longline fleet. The results showed that yellowfin tuna are eclectic in feeding habits and that fish is a major component of the diet.

A study of growth of juvenile yellowfin tuna was reported in document SCRS/79/51. The study was based on size frequency analysis, principally analysis of data from Tema-based baitboats and from tagging results conducted in the Gulf of Guinea from 1971 to 1976. The document concludes that a slow growth phase seems to exist in 40 to 65 cm long yellowfin tuna. This finding alters the view that growth of juvenile fish is rapid when predicted from extrapolation of the von Bertalanffy growth curve obtained from data on larger fish. Because this finding can have an impact on yield-per-recruit analysis (including minimum size considerations), it should receive further scrutiny.

Document SCRS/79/52 analyzed the frequency and size composition of purse seine sets made by the FISM fleet from January 1976 to July 1979. The study showed that the catch of pure yellowfin tuna sets are, on the average, larger (average 23 MT) than pure skipjack tuna sets (average 10 MT), while mixed yellowfin-skipjack tuna sets are even larger. This same study showed that small yellowfin of less than 5 kg are most often caught in mixed schools with skipjack tuna. This finding suggests that the impact of strictly applying the ICCAT minimum size limit of 3.2 kg seriously affects the catch of skipjack tuna.

a-V. STATUS OF STOCKS

a-V.1. Production model analysis

Production model analysis is an assessment tool that is used to evaluate the condition of the yellowfin tuna stocks. It must be noted, however, that considerable caution must be used in drawing conclusions from production model analysis beyond the limits of the available data. Three documents (SCRS/79/92, 104 and 109-a) presented results of production model analysis conducted for yellowfin tuna. The estimates of CPUE, catch and effective fishing effort used in the documents differed; however, the conclusions presented were not substantially different.

a-V.1.i. Total Atlantic

Documents SCRS/79/92 and 109-a analyzed data with the assumption of a single

Atlantic-wide stock of yellowfin tuna. The data sets used in the documents differed in the following ways: SCRS/79/92 used catches that were 1-3 percent greater, a longer time series of data (1964-78), and CPUE derived from procedures developed in previous years than those used in SCRS/79/109-a.

The results of the analyses continue to support the conclusion that the yield curve relating average sustained catch to estimated effective fishing effort is broad and flat-topped, i.e., curve labeled m = 0 in Fig. 4. However, the Committee noted that while this curve implies that sustained catch theoretically never declines at very high levels of effective fishing effort, in fact at some high level of effective fishing effort the stock will become so depressed as to result in a significant reduction in recruitment and the sustainable catch will decline. Considerable caution must, therefore, be used in drawing conclusions from beyond the limits of the available data from which the curve was derived, as long as there is no information about higher effort levels.

The estimates of maximum sustainable yield (MSY) for the stock ranges from 113,000 MT to 175,000 MT depending on which of the curves in Fig. 4 is actually true. These estimates are 5 to 8 percent greater than those provided in last year's SCRS report (Biennial). The current catch (for 1978), exceeds by 3-12 percent the MSY calculated for the curve for m = 1 and with effective fishing efforts that are substantially below those which produce MSY's. The curves for m = 0 show some increases in catch can be had with further increase in fishing effort at the expense of further reduction in CPUE.

a-V.1.ii. Eastern Atlantic

Production model analyses using the assumption of a separate eastern Atlantic (Fig. 5) stock were conducted in documents SCRS/79/85, 104, and 109-a. The production model was fitted to (1) total and (2) inshore (traditional) eastern Atlantic surface fishery data with the assumption of constant longline fishing effort. Document SCRS /79/109-a also fitted the model to the combined data of the surface and longline fisheries for the eastern Atlantic.

Different CPUE's were used in the documents, but the general conclusions reached were the same—the stock is being heavily exploited, the degree depending on the MSY chosen. The MSY for the total eastern Atlantic surface fishery is shown in Fig. 6. The optimistic picture is the curves labeled with m = 0 (Fig. 6) which, if the present information is correct, indicates that the yield can be increased to about 162,000 MT with a very large increase in fishing effort, but with a corresponding decrease in CPUE. The Committee noted that although these curves with m = 0 implies that sustained catch never declines at very high levels of fishing effort, at some high level of effective fishing effort sustained catch will decline. The more conservative picture is the curve labeled with m = 1.0 and m = 2.0 which indicates that the current fishery is operating above MSY (92,000-103,000 MT) and no significant increase in yield from the average current levels can be expected with increased fishing effort.

Analyses based on data for the inshore surface fishery only give lower MSY estimates (Fig. 7) since a smaller stock is exploited. Analysis based on both surface and longline fisheries data resulted in no significant change in MSY estimates obtained when data for only the surface fishery were used (SCRS/79/109-a).

Apart from the differences in the data sets used in the documents, the conclusions appear to be the same. Reasonable objective criteria for choosing among the different models are unavailable; consequently, if $m = 1$ or $m = 2$ is true, then the fishery is currently operating at a level close to MSY and any increase in effective fishing effort will not result in any notable increase in sustained yield, and the MSY estimates are appropriate. If $m = 0$ is true, then either increases in effective fishing effort or continued exploitation of large fish can result in increased sustained yield approaching that of the MSY estimates. Recent increases in yield have largely been the result of the fishery exploiting a somewhat larger stock by expansion of the fishery westward and a somewhat broader size composition of fish with increased numbers of larger fish. If the westward expansion of the fishery continues and the fishery is able to exploit fish not exploited, or only exploited lightly, there are opportunities for further increase in yields than the production models in Fig. 6 and 7 would suggest.

a-V.1.iii. Western Atlantic

Document SCRS/79/109-a used data from the longline fishery of the western Atlantic to analyze the condition of the western Atlantic stock. The analysis gives MSY values ranging from 16,000 MT to 22,000 MT (Fig. 8) with current catches at or below MSY and current levels of fishing effort above those giving MSY with $m = 1.0$ or $m = 2.0$. The results of this analysis suggest that the longline fishery in the western Atlantic cannot significantly increase its total catch with increase in fishing effort. However, this is not to say that a significant increase in yield might not be had if a different pattern of fishing is used, such as development of a more substantial surface fishery. But it should be noted that this assessment is based on the critical assumption that the stock in the western Atlantic is indeed for all practical purposes separated from the stock of the eastern Atlantic.

a-V.2. Yield-per-recruit analysis

No new information was presented to the Committee on yield-per-recruit. Previous reviews of yield-per-recruit performed by the Committee (e.g. SCRS/78/18), however, showed that a modest increase in yield-per-recruit for the fishery as a whole has been realized since 1973. The effect for the individual gears, on the other hand, was mixed and more pronounced; the longline fishery experienced about 57 percent reduction in equilibrium yield-per-recruit, the purse seine fishery a 55 percent increase and the baitboat fishery a 45 percent decrease. Further increases in yield-per-recruit can be realized if fishermen can avoid catching small fish. On the other hand, if small fish continue to be caught, and are landed or discarded dead in large numbers, there may be little or no increase in the effective size-at-first-capture and no increase in yield-per-recruit. Data presented to the Committee showed that substantial numbers of small yellowfin continue to be caught (SCRS/79/61) and discarding of undersized fish at sea is occurring (SCRS/79/26 and 102). Because of these events, and the possibility that growth of juvenile fish is slower than earlier believed, the Committee recommends that yield-per-recruit analysis be conducted.

a-V.3. Recruitment analysis

No new information on recruitment was presented to the Committee. The occurrence of 3-year-old fish appears to be unusually low in the FIS fleet catch for the first nine months of 1979 as compared to that of 1978 (SCRS/79/109-a). Although this observation as an index may not directly mimic the abundance of recruitment, its behavior suggests some significant changes occurring in the population. The Committee, therefore, stressed the need that the size of the spawning stock and the size of the recruited stock be carefully and regularly monitored.

a-V.4. Current appraisal

The Committee's appraisal of the condition of the Atlantic yellowfin tuna stocks is unchanged from previous years. The stocks are heavily fished, particularly in the eastern Atlantic where approximately 120,000 MT of yellowfin tuna were caught in 1978. In recent years, much of the increase in catch seems to have been the result of a westward expansion of the eastern Atlantic surface fishery. It is not known to what extent this expansion can continue or what further increases in catch might result from such an expansion.

Further increases in yield will also depend on the sizes of fish caught. If small fish continue to be caught or discarded dead in large numbers, there may be little or no increase in the effective size-at-first-capture and no increase in yield-per-recruit. On the other hand, if the effective size-at-first-capture should increase, the yield should likewise increase.

a-VI. EFFECTS OF REGULATIONS

In 1972, ICCAT adopted a minimum size regulation of 3.2 kg (or 55 cm) with a 15 percent tolerance in number of fish per landing for yellowfin tuna. The regulation entered into effect on July 1, 1973. As originally recommended by SCRS, the regulation was intended to improve the yield of Atlantic yellowfin tuna to the fishery. Despite the regulation, however, a large amount of fish (in numbers) in the surface fishery catch continue to be less than 55 cm. For example, the average percentage of yellowfin tuna caught in 1974 through 1976 that were below the minimum size level was in excess of 60 percent for baitboats and in excess of 20 percent for purse seiners. In the Gulf of Guinea, along the coast, the amount of small yellowfin tuna being caught is particularly high. The average number of fish less than 55 cm was 60 percent of the catch in numbers for 1975-78 and this percentage held for all months of the year (SCRS/79/26).

In addition, the regulation has encouraged the practice in which catches of undersized fish are mislabeled as bigeye tuna or vice versa and catches of undersized fish are discarded at sea dead.

The specific effects of the regulation continue to be impossible to ascertain at this time, because of lack of accurate information on the catches of undersized fish, marked

changes in the level of fishing mortality by the three major gears in the fishery since the adoption of the regulation, and shifts in the ages of fish exploited by the gears independent of the size limit.

However, four documents (SCRS/79/26, 52, 61 and 85) presented to the Committee contained some information on the effects of the regulation. SCRS/79/61 showed that for the Japanese baitboat fleet 61-78 percent of the total catch is skipjack tuna, whereas for the FISM baitboat fleet, the skipjack tuna catch is a smaller proportion, 31-41 percent. SCRS/79/52 noted that most small yellowfin tuna (< 5 kg) caught by the FISM purse seine fleet are in association with skipjack tuna.

The distribution of catches of undersized yellowfin by area and time was discussed in SCRS/79/26 and 85. The results show that catches of undersized fish are concentrated in certain areas of the Gulf of Guinea and off Senegal during certain times of the year (third and second quarters, respectively), and these areas overlap the distribution of catches of larger yellowfin tuna and skipjack tuna.

Finally, SCRS/79/26 gave estimates of discards of 1,655 MT and 6,650 MT of yellowfin tuna for 1977 and 1978, respectively. An evaluation of the misidentification of yellowfin and bigeye tunas was also presented in this document, the results having been discussed in section II.1.

a-VII. RECOMMENDATIONS

a-VII.1. Statistics

The fishery statistics for Atlantic yellowfin tuna are relatively good but there are some serious problems that need attention:

i) Actual catches of small yellowfin tuna and small bigeye tuna must be monitored more closely, particularly through regular species composition sampling at major landing ports. The major fleets that need to be monitored more closely are the Spanish and Tema-based fleets.

ii) Discards of catches at sea must be estimated through a combination of encouraging fishermen to record such information in logbooks and sending technicians to sea aboard fishing vessels to collect data.

iii) Although coverage of logbook statistics for the Korean baitboat fleets and Spanish purse seine fleet has improved, more complete coverage is required.

iv) Data on days fishing, as defined in ICCAT's sampling manual, for the Japanese baitboat fleet are needed, including data for past years.

a-VII.2. Research

Research should continue along established lines that have been promulgated by

SCRS. In addition, for the 1979-1980 year there is a need to:

i) carefully monitor the size of the spawning stock and the size of recruitment;

ii) examine methods other than a minimum size limit that might result in increasing the effective size-at-first-capture;

iii) examine the effects of changes in population parameters, i.e. growth and mortality and in the fishing, i.e. discards on yield-per-recruit;

iv) validation of the new growth curve for yellowfin tuna.

a-VII.3. Management

The Committee's recommendation on the 3.2 kg minimum size regulation is the same as noted in past years. That is the Committee recognizes that there appear to be considerable practical difficulties in effectively implementing the 3.2 kg size limit in some fisheries, to such an extent that the regulation's intent is not being realized. Furthermore, the existence of the size limit is giving rise to uncertainties and inaccuracies in the data base which is essential for accurate scientific assessment of the condition of the stocks and for management advice. The Committee, therefore, recommends every effort be made to apply the size regulation so that the benefits of the regulations can be realized.

If the Commission chooses to reject this recommendation, the Committee recommends that additional measures be considered to limit or reduce the catches of small yellowfin tuna. However, the Committee does not currently have specific recommendations for additional measures. A working group to investigate alternative management schemes has been established to look into this matter and provide advice.

a-VIII. EVALUATION OF PROGRESS MADE ACCORDING TO THE ASSIGNMENTS MADE IN 1978

Not all tasks assigned to scientists at the 1978 SCRS meeting were completed. However, a great number of studies that were not assigned were completed and provided the Committee with new information to base this year's assessment of the yellowfin tuna stocks.

12-b SKIPJACK

b-I. Review of current research

With the proximity of the International Skipjack Year there were more studies on skipjack this year than in the past. Seventeen documents were presented, concerning

either biology, statistics or status of the stocks.

Two important documents, that will be considered in detail in other sections of this report, discussed skipjack at length; these are SCRS/79/24 (Report of the Sub-Committee on Skipjack) and SCRS/79/26 (Report of Joint CECAF/ICCAT Meeting on Juvenile Tropical Tunas).

SCRS/79/37 and 38 studied skipjack reproduction in the Atlantic, from 1969 to 1977. SCRS/79/49 and 87, and a document presented to the Working Group on Juvenile Tropical Tunas*, studied reproduction periods and areas, based on larvae collection. SCRS/79/56 discussed the presence of juvenile skipjack in the stomach of tunas and tuna-like species caught off south-east Brazil.

SCRS/79/55 described a method of skipjack otolith extraction for subsequent growth studies. SCRS/79/52 analyzed size and species composition of FIS purse seine sets, as well as their development in relation to CPUE. SCRS/79/66 traced the history of the Spanish tuna fleet composition, fishing areas and the development of catches by fishing capacity in MT.

SCRS/79/61 and 116 studied the Tema-based Japanese baitboat fishery. The first document analyzes the time-area distribution of yellowfin, skipjack and bigeye tunas before and after the yellowfin size limit was put into effect. The second document compares catch and effort distributions in the first eight months of 1979 to those during the same period in 1978.

SCRS/79/80 synthesized the environmental factors which characterize the habitat limitation of skipjack, (as inferred from research on central and eastern Pacific skipjack) so as to provide a general description of the probable Atlantic areas favorable to skipjack occurrence and vulnerability to a purse seine fishery. This document assumes that no major physiological differences characterize Atlantic skipjack. SCRS/79/103 presents an analysis of the FIS fleet catches in relation to surface water temperatures.

Finally, SCRS/79/104 and 118 discussed the status of skipjack stocks in the eastern Atlantic during the period 1966 to 1978.

b-II. REVIEW OF FISHERIES DATA

b-II.1. Catch trends

Table 3 summarizes statistics from 1966 to 1979. Skipjack catches have increased steadily from 1966 until 1974 when they reached 116,000 MT. Following a decrease in 1975 and 1976, catches peaked in 1977 at 121,000 MT. 1978 was a good catch year for skipjack (108,200 MT) even though this is 11 percent less than the record 1977 catch. The preliminary 1979 catch estimates compared to 1978 show a 20 percent decrease for the purse seine fleets (FIS and Spain), and a 12 percent increase for the baitboat fleet (Japan). The preliminary 1979 catch is 87,000 MT.

*Caverivière and Suisse de Sainte-Claire, CRO-Abidjan, document in press.

In general, catches are from the eastern Atlantic. In the western Atlantic catches have fluctuated around 3,000 MT from 1973 to 1978. Longline catches are minimal, less than 200 MT during this period.

b-II.2. Effort trends

In this multi-species tuna fishery skipjack is generally exploited by vessels fishing three tropical species. Therefore, the trend of nominal fishing effort in effective fishing capacity is the same as for yellowfin (Table 2). Fishing capacity has increased from 7,200 MT in 1967 to 62,300 MT in 1978. In 1979, it is estimated at 54,700 MT, declining by 12 percent over last year.

b-II.3. Catch rate trends

Two CPUE measures (in MT/standard day of fishing) were proposed for eastern Atlantic skipjack:

–The first (SCRS/79/104) was based on average CPUE by fifteen-day periods and by 1^{o}x1^{o} squares for FIS purse seiners operating in the traditional coastal zone.

–The second (SCRS/79/118) took CPUE into account by zones for the FIS (baitboats and purse seiners), U.S. (purse seiners) and Japanese (baitboats) fleets. After standardization, an average Atlantic CPUE was calculated for the coastal zone.

The trends of these two CPUE's are very similar (Fig. 9) and fluctuate from one year to the next. The estimated range of CPUE is from 0.70 to 3.05 MT per standard day fishing.

The CPUE's for 1978 were average, showing a substantial decrease in relation to the higher values in 1977. The preliminary estimate of 1979 CPUE obtained from the FIS fleet showed a 30 percent decrease from 1978 and the Spanish purse seine fleet showed similar results. The Japanese baitboat fleet showed a 12 percent increase in CPUE for the first eight months compared to that for the same period in 1978 (SCRS/79/116).

Several problems can affect the precision of Atlantic skipjack CPUE estimates:

–The skipjack fishery is a multi-species fishery;

–The coverage rate for catch and effort data for several important skipjack fisheries (Spanish, Korean) is poor;

–The FIS fleet CPUE is the major part of this estimate and may not represent a good CPUE index for skipjack;

–The seasonal aspect of the U.S. fishery may bias CPUE estimates;

–The effort used for Japanese baitboats, catch per successful day's fishing, may over-estimate abundance in the poor years, especially if this is caused by a reduction in the number of schools and not to a decrease in their size.

b-III. STOCK STRUCTURE

Several of the documents presented indicated the presence of skipjack larvae in the tropical Atlantic, with large concentrations in many areas:

– In the Caribbean Sea to areas off Brazil, with a peak apparent spawning season from January to March. Larval abundance in this area is higher than than observed in the eastern Atlantic, primarily in the Gulf of Guinea (SCRS/79/49). This is also confirmed by the presence of juvenile skipjack in the stomach of tunas and tuna-like species (SCRS/79/49);

– In the Gulf of Guinea, north of the Equator and between 4°E and 8°W during the warm season (Caverivière and Suisse de Sainte-Claire, 1979);

– In the Gulf of Mexico, where many larvae were collected during April-May.

Areas where skipjack tuna can occur in the Atlantic were identified based on annual average environmental conditions as recorded in document SCRS/79/80. Skipjack could occur in almost the entire Atlantic, from 40°N to 40°S. This distribution is confirmed by the incidental longline skipjack catches within these same limits (SCRS/79/79).

The annual average picture from document SCRS/79/80 presented in Fig. 11 lends credence to the hypothesis that a potential new fishing area for skipjack occurs in the western Atlantic. However, for a more realistic evaluation of fishery potential, annual and inter-annual seasonal variation of the environmental conditions must be taken into account, as well as the potential for regional physiological differentiation of the Atlantic population of skipjack. The study did not consider these specific problems, but nevertheless is quite valuable as a research stimulus and reference.

In the eastern Atlantic, CPUE variations appeared to be synchronous in different fishing areas, perhaps with the exception of Dakar (SCRS/79/118). However, this phenomenon is difficult to interpret given the actual situation.

Nevertheless, none of the information provided conclusive evidence for the existence of one or more Atlantic skipjack stocks, and in particular, of an east-west stock separation. Research to answer this question will be of high priority during the International Skipjack Year Program.

b-IV. POPULATION PARAMETERS

SCRS/79/103 presented an analysis of the relationship between skipjack catches and surface water temperature. Mixed catches were observed at approximately 24°C to 27°C. Skipjack predominated colder waters (<24°C), particularly in frontal zones.

SCRS/79/52 presented an analysis of catch by sets based on data taken from a sample FIS purse seine fleet and showed that skipjack sets were generally either pure or mixed with yellowfin. The pure skipjack sets were typically smaller than mixed sets (10 MT for purse sets, 25 MT for YF-SJ mixed schools). The average catch of purse seine sets on pure skipjack schools seems to be stable from year to year and without trends in spite of the large CPUE variations observed during the period of the study. This seems to indicate that the changes in CPUE for this species are due more to a change in the number of schools than to a change in school size.

b-V. STATUS OF STOCKS

The status of the skipjack stocks is difficult to assess because of doubts concerning parameter estimates and the lack of a reliable definition of fishing effort.

b-V.1. Production model analysis

b-V.1.i Total Atlantic

No production model analysis for the total Atlantic was presented due to the low catches in the western Atlantic and the lack of knowledge concerning stock structure.

b-V.1.ii Eastern Atlantic

CPUE data from document SCRS/79/118 were used to compute total standardized effort for the eastern Atlantic. The catch-effort and CPUE-effort relationship are shown in Fig. 10. These data show a decrease in CPUE as fishing effort increases associated with large fluctuations in CPUE. However, the Committee felt that it was not possible to fit a production model to these data for two major reasons:

- The CPUE presently used may not reflect abundance of the stock due to insufficient data and improperly measured effort data;
- The large fluctuations in availability in most skipjack fisheries.

b-V.1.iii Western Atlantic

No production model analysis in the western Atlantic was presented because of the poor catches in this area as well as the lack of available information on this fishery.

b-V.2. Yield-per-recruit-analysis

No new analysis was presented; however, on the basis of SCRS/76/89, it was thought that no benefits could be obtained from a size regulation given the present fishing pattern.

b-V.3. Recruitment analysis

A reliable index of recruitment for skipjack tuna has not been identified. The only available index is average Atlantic CPUE. Because of the small number of age classes in the catch (1 or 2 age groups), the CPUE may reflect fluctuations in recruitment. However, since large fluctuations in availability are common for this species, changes in CPUE cannot be directly interpreted as fluctuations in recruitment.

b-V.4. Current appraisal

From all the information available to the Committee, it appears that skipjack tuna in the eastern Atlantic are currently fished at a high level. However, in the western Atlantic, where skipjack fishing is at a low level, there are increasing and numerous indications that there is a significant exploitable stock, i.e. abundance of skipjack larvae in various sub-areas of the western Atlantic (from southern Brazil to the Gulf of Mexico), juvenile skipjack found in predators' stomach contents south of Brazil and existence of adequate oceanographical conditions for skipjack purse seine fishing in the area (SCRS/79/80). However, it must be noted that this estimate is only valid for a purse seine fleet.

All these results seem to confirm the hypothesis that skipjack fisheries could be developed in the western Atlantic. The consequences of this new exploitation would vary depending on whether the western stock is or is not distinct from the eastern stock. If the stocks are separate, the development of the western fishery could lead to a sharp catch increase. Otherwise, an increase in effort in the western Atlantic may only lead to a small increase in total catch.

Also, some incidental but significant catches of very large skipjack by surface fisheries during 1979 in the Bay of Biscay and in the northwest Atlantic have been reported to the Committee. They confirm the existence of a stock of large size skipjack which are presently not available to any fishery.

Thus, the true potential catch of skipjack in the Atlantic appears larger than the present one, but that potential remains unknown. The International Skipjack Year Program has been designed in order to answer that question.

b-VI. EFFECTS OF REGULATIONS

There is no regulation in effect or planned for skipjack tuna. However, it should be recalled that a bigeye size regulation (like the yellowfin size regulation) will affect skipjack catches unfavorably if it is enforced.

b-VII. RECOMMENDATIONS

b-VII.1. Statistics

i) Catch statistics are relatively good. However, an attempt should be made to improve those from certain small fleets, since their data are not precise.

ii) While recognizing that the data collection improved in recent years, the Committee recommended that further improvements in the collection of Task II data for Spanish purse seiners and Korean baitboats are needed. This will permit the Committee to improve its evaluations in the future.

iii) Finally, effort statistics from Japanese baitboats should include research time in order to make them compatible with those of other fleets.

b-VII.2. Research

The Committee reiterated its recommendations made in 1978, namely requesting an increase in available data in order to complete its work and provide the Commission with pertinent advice. It should be remembered that the International Skipjack Year Program was formulated with that in mind, and the Committee has great expectations for the Program.

b-VII.3. Management

Even though only partial and insufficient information is available, the Committee thinks, at this time, that no management measure is necessary.

12-c BLUEFIN

c-I. REVIEW OF CURRENT RESEARCH

Resource assessment research investigating stock abundance, recruitment, and fishing mortality rates was reported. SCRS/79/98 analyzed age-specific stock sizes and fishing mortalities for the entire Atlantic. SCRS/79/58 estimated fishing mortality rates from Gulf of Mexico longline CPUE data. SCRS/79/59 estimated eastern Atlantic recruitment trends and SCRS/79/98 calculated recruitment levels in the western Atlantic and in the entire Atlantic. SCRS/79/83 investigated errors incurred using virtual population analysis to assess bluefin resources. Fishing mortality rates were estimated directly from mark-recapture data for 1964-1975 in SCRS/79/90 and for 1978 in SCRS/79/98. As recommended by SCRS in 1978, the use of CPUE as indices of recruitment was thoroughly investigated for Mediterranean purse seine data in SCRS/79/74.

The recent status of the French Mediterranean purse seine fishery was reported in SCRS/79/72. The results of marking experiments in the Bay of Biscay were reported in SCRS/79/60 and 65, a task recommended as high priority by SCRS in 1978. Natural mortality rate estimates, another recommended task of high priority, were reported in SCRS/79/90. Models recently derived to transform various measures of size were reported in SCRS/79/73, 88 and 98. Tag shedding rates were estimated in SCRS/79/84. Further investigations of age and growth were reported in SCRS/79/67, 73 and 75.

Several studies related to aspects of stock separation were reported. SCRS/79/76 related recent mark-recapture data to migration and stock identification. SCRS/79/82 presented an analysis of parasite data used as biological tags to investigate transatlantic movements of juvenile fish. SCRS/79/96 updated electrophoretic studies. SCRS/79/95 summarized currently available information pertaining to stock separation hypotheses. SCRS/79/89 investigated the impact of separate two stock management upon fisheries in the west if a single stock exists transatlantically. SCRS/79/45 compared larval abundance and reproductive stock abundance in the Mediterranean Sea and the Gulf of

Mexico and SCRS/79/81 presented the geographical distribution and abundance of larvae within the Gulf of Mexico. U.S. mark-recapture experiments were updated by SCRS/79/99 and SCRS/79/48 reported eastern Atlantic data. Canadian catches were updated by SCRS/79/111 and mark-recapture data, including estimates of shedding rates, by SCRS/79/112. A study of CPUE from the Canadian rod and reel fisheries for giant tuna was reported in SCRS/79/113.

c-II. REVIEW OF FISHERIES DATA

c-II.1. Catch trends

The location of catch of longline fleets of Taiwan, Korea and Panama is not available, rather only Atlantic-wide catches are available. Therefore, even though the presence of those fleets in concentration in some areas such as the Mediterranean has been observed, those catches are not represented in the following review of catch trends by area. These Atlantic-wide total nominal catches decreased from 167 MT in 1977 to 79 MT in 1978 (Table 4). Preliminary estimates of 1979 catches are included in Table 4.

c-II.1.i Mediterranean

Although catches by artisanal fisheries and by fisheries directed at other species are as yet mostly unknown, current catch data are much more complete than in the past (Table 4). Catches increased in 1970-1976 then decreased in 1977-1978. The estimated total bluefin catch in 1978 was 8,182 MT, about 30 percent lower than the 1977 level and 50 percent lower than the peak level of 1976.

c-II.1.ii Eastern Atlantic

Total catch ranged from 4,337 MT to 9,886 MT during 1970-1978. The nominal catch in 1978 was at relatively the same level as in 1977. However, specific fisheries within this area showed changes. The Portuguese catch increased considerably from 82 MT in 1977 to 2,775 MT in 1978. The Norwegian catch decreased from 764 MT in 1977 to 168 MT in 1978. The Moroccan surface fishery catch declined from 662 MT in 1977 to 36 MT in 1978, while the Bay of Biscay surface catch increased from 1,617 MT to 2,300 MT and the Spanish trap catch increased from 339 MT to 450 MT.

c-II.1.iii Western Atlantic

Total catches declined from 6,597 MT in 1977 to 5,233 MT in 1978, an 11 percent decline as a result of declines in Canadian and Japanese fisheries. U.S. catches have remained relatively constant since 1976.

c-II.2. Effort trends

c-II.2.i Mediterranean

Japanese longline effort has remained at low levels since 1977 and the fishing effort of Korean and Panamanian longline fisheries remained unreported. Tunisian trap effort has remained constant since 1975 and Italian trap effort declined. Trap effort for Libya and Turkey is not documented. The extremely dispersed nature of small coastal fisheries in the Adriatic, off Sicily, and off Spain that catch small bluefin greatly impairs data collection. Effort trends of these fisheries are thus unknown. The total number of Italian, French and Yugoslavian purse seine vessels has remained constant, 1975 to 1978. The number of vessel days fished by the French purse seine fleet did, however, decrease 40 percent from 1977 to 1978.

c-II.2.ii Eastern Atlantic

In the eastern Atlantic, the Japanese longliners continued to decrease their effort in the area of the Strait of Gibraltar (SCRS/79/58). Japanese longline effort did increase, however, from the 1977 level in the oceanic waters west of Africa, but since bluefin catches in this area are incidental to those of bigeye, that increase is not likely significant. In the Bay of Biscay, effort declined during 1976 and again in 1977. In 1978, effort increased by 66 percent, but 22 percent of 1978 effort was expended by boats fishing for albacore, which catch bluefin only incidentally (SCRS/79/60).

The number of Moroccan purse seine vessels participating in the fishery has historically been variable (SCRS/79/59) due to changes in bluefin availability during 1965-1978 (SCRS/79/92).

c-II.2.iii Western Atlantic

Japanese longline effort and Canadian fishing effort for giant bluefin and the number of U.S. purse seine vessels has remained constant from 1975 to 1978.

c-II.3. Catch rate trends

c-II.3.i Mediterranean

The decreasing trend of CPUE of Japanese longline fisheries that began in 1974 continued in 1978, while Spanish longline CPUE increased slightly. The decreasing trend of CPUE of Italian and Tunisian traps which began in the early 1970's continued in 1978.

The accuracy of data from the Italian purse seine fishery is as yet undetermined. These data do not indicate a constant CPUE level. The variation in the CPUE is also indicated by the catch per boat-year of the Yugoslavian purse seine fleet which has increased from 10 MT/boat-year in 1975 to 69 MT in 1978; and the catch per boat-day

of the French purse seine fleet varied considerably from 1975 to 1978 (see text table below).

c-II.3.ii. Eastern Atlantic

Bay of Biscay baitboat CPUE decreased from 1972 to 1975, then generally increased from 1975 to 1979, as shown in the text table below (SCRS/79/60). The catch per vessel from the Moroccan purse seine fleet was also variable during the period from 1965 to 1977, as shown in the text table below. The number of vessels operating in 1978 and 1979 is not known so recent CPUE levels are unavailable.

Type	*Effort Measure*	*1965*	*1966*	*1967*	*1968*	*1969*	*1970*
Mediterranean PS fleet	MT/catch/ vessel-day	--	--	--	--	--	--
Bay of Biscay BB fleet	MT/thousand man-days-fished	--	--	--	--	--	--
Moroccan PS fleet	MT/vessel-year	28.30	--	10.40	8.60	37.20	13.80

1971	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*
--	--	--	--	0.55	1.41	1.20	1.00	--
--	100.30	68.70	68.50	55.30	62.20	89.70	76.80	83.90
2.70	11.50	16.90	21.20	27.00	20.90	8.90	--	--

c-II.3.iii. Western Atlantic

In the Gulf of Mexico and off Canada, Japanese longline CPUE increased in 1978 back to 1976 levels (SCRS/79/58). The recent increase apparently reflects the abundant 1973 year-class. CPUE from the Canadian rod and reel fishery for giant bluefin demonstrated a clear decline during 1975-1978 (SCRS/79/113).

c-III. STOCK STRUCTURE

Several documents which dealt with the possible separation of stocks were presented (SCRS/79/76, 82, 89, 95, 96). Electrophoretic analysis of enzyme systems provided no additional information in regards to stock structure (SCRS/79/96). Japanese longline data show catches occur across the Atlantic (SCRS/79/95). A study based on mark-recapture data to investigate stock discreteness indicated some transatlantic inter-

change of juveniles (SCRS/79/95). The use of parasites as biological tags suggested this (SCRS/79/82). Mark-recapture data showed large fish also cross the Atlantic from west to east.

Interchange may be either sporadic (SCRS/79/76) or regular (SCRS/79/82). Current data indicate that interchange of juveniles is not greater than 15 percent when interchange occurs. The existence of two temporal and spatially separate spawning areas is well known. The pattern of relative abundances of successive year-classes indicates differences between east and west segments in that the 1973 year-class was very abundant in the west while the 1974 year-class was abundant in eastern waters. These latter two phenomena confirm independence of reproductive success, perhaps indicating biological discreteness. The data are not yet sufficient to provide for consensus as to whether there are one or two stocks in the Atlantic. In conclusion, it may be stated that the present evidence (which is still somewhat weak) is towards the hypothesis of separate eastern and western stocks, with a small and variable interchange of fish between them. However, the evidence is still not sufficient to reject the alternative hypothesis that there is a single Atlantic-wide stock.

c-IV. POPULATION PARAMETERS

c-IV.1. Natural mortality rate

Based on Barbate trap catches of large fish from 145 to 260 cm in length during 1963-1975, a coefficient of natural mortality (M) was estimated to be 0.18*. Tag return data from west Atlantic small fish tagging experiments were analyzed and annual instantaneous loss rates due to natural mortality plus the non-reporting of recaptures were calculated to be as high as 0.80 in 1964 and as low as 0.14 in 1970 (SCRS/79/90). If M is assumed constant from year to year on small fish, then the difference between 0.80 and 0.14 is caused by different levels of non-reporting. The report estimated M for small fish to be 0.14, assuming non-reporting to be negligible in 1970. Therefore, current information indicates the rate of natural mortality to be about 0.14 for small fish and 0.18 for the large fish in the trap study.

c-IV.2. Growth

Growth curves recently derived and currently used to assess bluefin stocks are somewhat different for large fish (Fig. 12).

Document SCRS/79/67 presented for the first time results of analyses of dorsal fin ray rings for bluefin ranging in age from 1 to 19 years. A study of the growth of fish from the Mediterranean (SCRS/79/73) indicated that growth rates have remained stable during the last 50 years. Recent recaptures of three fish at liberty for 13 to 14 years supported the hypothesis that bluefin are very long lived. One fish estimated at 125 kg when released was 279 cm when recaptured 13.3 years later.

*Rodríguez-Roda, 1974, Inv. Pesquera, 41 (2) 263-273.

c-V. STATUS OF STOCKS

c-V.1. Production model analysis

To date a single over-all index of fishing effort or CPUE has not been developed; therefore, production model analysis was not carried out.

c-V.2. Yield-per-recruit analysis

No new yield-per-recruit studies were reported. The most recent studies are summarized in the 1978 Report of the SCRS. These studies showed yield-per-recruit to have dropped in both the east and west Atlantic with the increased exploitation of small fish during the period from the 1950's to early 1970's. The previous conclusion that increased yields will result if size-at-first-capture is increased still applies.

c-V.3. Recruitment analysis

c-V.3.i. Eastern Atlantic and Mediterranean

In SCRS/79/59 a cohort analysis of eastern Atlantic catches (not including the Mediterranean) indexed apparent recruitment since 1964 of age-class 1 bluefin (Fig. 13-a). This analysis assumed that the degree of interchange between the Mediterranean and eastern Atlantic is negligible for tunas 1 to 4 years of age. No clear trends in recruitment were observed although it was noted that the 1974 cohort was very abundant and the 1975 cohort may have been strong.

c-V.3.ii. Western Atlantic

Calculations of age 1 abundance trends showed that the levels were variable during the period 1960-73 (Fig. 13-b).

SCRS/79/98 indexed the 1973 cohort to have been extremely abundant, in fact, the most abundant during the period of analysis. However, the 1974 cohort is indexed to be average and the 1975, 1976, and 1977 cohorts appeared to be quite small. Recruitment into juvenile fisheries appears to have been poor since 1976. Corresponding increased recruitment of age 6 fish into the adult stock was observed in 1977, 1978 and 1979, with 1979 adult recruitment being highest of that period.

c-V.3.iii. Total Atlantic and Mediterranean

Year-class strength, as indexed by age 1 abundance estimated from virtual population analysis (Fig. 14) indicated a general downward trend during that period, 1964 to

1971. However, age 1 fish are thought to be greatly under-reported and to that extent recruitment is under-estimated. The 1972 year-class was apparently slightly below average, followed by strong 1973 and 1974 cohorts. The 1975 cohort was average or slightly above average. These indices show the 1976 and 1977 cohorts to be of low abundance. Therefore, the high recruitment into the juvenile fisheries that occurred in 1974-76 was evidently not realized Atlantic-wide in 1977 and 1978. Recruitment into the adult fisheries (age 6+) remained relatively constant 1960-68 then decreased reaching a low in 1975 and has been steadily increasing since. Preliminary estimates indicated high levels in 1979.

c-V.4. Current appraisal

c-V.4.i. Eastern Atlantic and Mediterranean

Analysis of data from eastern Atlantic fisheries suggested that the size of the bluefin tuna stock is increasing over levels of previous years. The 1974 cohort was apparently larger than those of 1969-1972 and should be recruiting into the adult (age 6+) stock in the near future. If pre-adult catches do not increase, increases in the adult stock may be expected. There is some indication that the 1977 cohort was weak, so that present juvenile abundance is probably not high.

c-V.4.ii. Western Atlantic

Abundance trends estimated from mark-recapture data and cohort analysis of the juvenile (age 1-5) stock reflect not only sizes of recruiting cohorts but also magnitudes of juvenile fish catches (SCRS/79/98). The apparent decline in juvenile stock size during 1961-67 was concommitant with high removals and a very slight downward trend in recruitment. The downward trend in abundance during 1970-72 also occurred with high catches of juvenile fish. Recruitment of the strong 1973 cohorts and average 1972 and 1974 cohorts increased juvenile abundance levels in recent years. These year-classes are now growing out of the juvenile age group and cohorts recently recruited are evidently of low abundances so that juvenile abundance is likely depressed and may become lower. The adult stock size (age 6+) apparently decreased in previous years to about one-third the former level. Recruitment of the 1972, 1973, and 1974 cohorts into the adult stock may be expected to increase adult abundance. Last year it was noted that exploitation could have reduced the extremely abundant 1973 year-class to an average level. Recent data indicated that this did not occur and that the 1973 cohort is still quite abundant.

c-V.4.iii. Total Atlantic and Mediterranean

Juvenile stock size decreased to 40 percent of the 1964 level by 1971 (Fig. 14). Sizable stock increases were realized with recruitment of the 1973, 1974 and 1975 year-

classes. As of 1978 juvenile stock size appears to be slightly above average, however, sizable decreases will be realized as the very weak 1976 and 1977 cohorts dominate the juvenile age group.

Adult fish stock size decreased 60 percent during 1968-77. Recruitment of the 1973, 1974 and 1975 cohorts into the adult stock may be expected to increase adult stock size during 1979 and 1980 if exploitation of these cohorts is not increased. Although considerable progress was made during the last year towards compiling a comprehensive and accurate catch inventory, those catches from the Mediterranean, particularly of age 1 fish used in this virtual population analysis, are believed to be incomplete and those inaccuracies may have affected stock size estimates.

c-VI. EFFECTS OF REGULATIONS

c-VI.1. Minimum size limit

The 6.4 kg minimum size limit was adopted in 1975 to reduce the catch of very young fish. The western Atlantic proportional catch of age 0 and 1 fish decreased from 21.7 percent before the regulation to 3.3 percent after its adoption (Table 5). In the eastern Atlantic the situation is not so clear. For example, the estimated proportion of age 1 fish in the Bay of Biscay catches did not decrease. In fact, average percent of undersized fish caught was 5.5 percent before the regulations and 32.5 percent after. However, the majority of this increase was due to a single year's catch. This increase was due to the very large catch of the 1977 year-class in 1978. Provisional 1978 statistics indicated the Bay of Biscay catches comprised only 1.6 percent, an obvious improvement. The Moroccan purse seine catches are almost entirely composed of age1 fish, both before the regulation and after, and that catch has decreased. Catches of undersized fish by the French Mediterranean purse seine fleet were low both before and after the regulation. Although the estimates of catch at age 0 and 1 for the entire eastern Atlantic are believed to be under-estimated, the available data indicate that a decrease from 59 percent to 41 percent occurred after the regulations.

c-VI.2. Fishing mortality limit

The effects of actions adopted in 1975 to limit fishing mortality to the levels of recent years can be evaluated in part by examining trends in available estimates of fishing mortality rates. Current levels of juvenile fish (age 1-5) in the west Atlantic (SCRS/79/98) seem to have stabilized in that area at a relatively low level since 1976. Estimates of adult (age 6^+) fishing mortality in the west Atlantic indicated that levels were low and stable from 1960-1973 and sharp increases occurred after 1973. From 1973 to 1974 a two-fold increase occurred. Further increases occurred in 1975 and again in 1976. Adult mortality rates have not increased since then (SCRS/79/58, 98).

The French-Spanish baitboat small bluefin fishery catch in the Bay of Biscay increased by 683 MT in 1978 over 1977. However, the Moroccan purse seine fishery showed a decline of 626 MT in the same period. As noted in SCRS/79/60, the Bay of

Biscay fishery exploits the same fish that occur along the Moroccan coast. Hence, these observations suggest the overall catch did not increase. There is no evidence to suggest that fishing mortality has increased in recent years.

The current analysis of the total Atlantic fishery indicates the fishing mortality rate on juvenile fish varied between 0.11 and 0.34 during 1960-1978 and the current level is 0.14. Fishing mortality rates on adult fish varied from 0.03 to 0.12 since 1960. A four-fold increase was observed from 1973 to 1976. The fishing mortality rate on the adult stock has since remained relatively constant at about 0.1.

c-VII. RECOMMENDATIONS

c-VII.1. Statistics

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

ii) Special efforts should be made to collect not only weights but also lengths from western Atlantic bluefin catches by the U.S.A., Canada and Japan.

iii) There are insufficient data available for the eastern Atlantic fisheries. Experts acting on behalf of ICCAT, have obtained important data from those countries concerned, especially non-member countries. This practice should be continued to improve the Mediterranean and eastern Atlantic data base. Much progress has been achieved, but information is still urgently needed for the following categories:

1) Catch data, especially for the coastal fisheries exploiting small bluefin.

2) Size data, or if unavailable, then catch breakdown by commercial use categories for unsampled fisheries.

iv) Increased funding to allow for computerization of the data base and compilation of the additional bluefin data is required.

Scientists conducting research on bluefin tuna agreed upon a common data base of catches and size-frequencies for the period since 1960, prior to analyses prepared for this SCRS meeting (COM-SCRS/79/25).

c-VII.2. Research

Two critical areas of research need to be addressed in the future so that present progress will continue. The amount and periodicity of interchange between eastern and western waters is of prime concern. Studies of parasites and other kinds of natural tags (i.e. microspectrometry) offer potential as well as mark-recapture experiments. The migration of small fish from the Mediterranean needs confirmation thus the recommendation to mark age 0 trap-caught fish in southern Spain near Gibraltar still holds.

The accurate estimations of recent year-class abundances are extremely important. The marking of small fish in the eastern Atlantic was very successful in 1978 and 1979

and recapture data from the 1978 releases provided extremely valuable information as to the fishing mortality and abundance of age 1 fish. These studies should be continued and extended into the Mediterranean. Although post-season tagging data from past experiments in the western Atlantic have been recently used to provide useful estimates, pre-season tagging is still required to confirm the accuracy of recruitment, current juvenile stock size, and fishing mortality estimates.

Significant progress has been made in evaluating the uses of CPUE in bluefin fisheries and in establishing such measures when applicable and such studies should continue. Although the problem of ageing large fish yet remains, some progress has been made and continued effort to resolve the problem is recommended.

Larval survey data, when available, can be used to define spawning areas more precisely and to provide independent estimates of spawning stock size. Additional survey effort outside the Gulf of Mexico area would be useful. Such data can be used to investigate the possible existence of a spawning area outside the Mediterranean in the eastern Atlantic so that these studies should continue.

Aspects of the biology of 145-200 cm (60-140 kg) fish, including migration patterns, have not been thoroughly investigated and emphasis should be placed on such studies.

c-VII.3. Management

Potential yield-per-recruit has probably increased on both sides of the Atlantic as a result of the current minimum size limit of 6.4 kg. However, yield-per-recruit analyses showed that additional increases could be obtained by raising the minimum size limit. The present minimum size limit should certainly be maintained, and if practical measures to achieve a higher effective size-at-first-capture are derived, the size limit should be increased.

Actions in accordance with the Commission's recommendation to limit fishing mortality appear to have been generally effective in terms of stabilizing fishing mortality rates. This has led to some increase in spawning stock abundance from recent recruitment. The Committee recommends that the present controls on fishing mortality be maintained.

The Committee examined the stock structure of the Atlantic bluefin for a number of years, but the answer to this problem is still not clear. However, it appears that management based on the separate stock premise might be a more efficient method of conserving Atlantic bluefin tuna stocks.

Since the general type of measures needed are the same under both hypotheses of stock structure, no major change in management practices are implied.

The Committee pointed out that:

i) In the event that there are two stocks, changing the area of operation of fisheries from one stock area to the other results in a differential change in the fishing mortality exerted on the two stocks.

ii) Where agreement can be reached on further measures to conserve the stock on one side of the Atlantic, implementation of these measures need not await agreement on uniform Atlantic-wide implementation.

iii) Failure to manage the stock on either side of the Atlantic could have serious repercussions on the other.

There are other recommendations regarding bluefin research, statistical analysis and subsequent evaluation of the status of the Atlantic-wide resource which will appear in the discussion of the general research requirements.

c-VIII. EVALUATION OF THE PROGRESS MADE ACCORDING TO THE ASSIGNMENTS MADE IN 1978

Task	*Priority*	*Country*	*Status*
Tagging in the eastern Atlantic	High	Spain	Considerable progress
Age determination for large fish	Low	USA, Canada	Some progress
CPUE indices as recruitment index	High	France, USA, Japan	Considerable progress
Current mortality estimate in the western Atlantic	High	USA, Canada, Japan	Considerable progress
Sensitivity analysis	High	USA, France, Canada	Not done
Natural mortality evaluation	High	USA	Considerable progress

c-IX. ASSIGNMENTS OF FUTURE WORK TO THE SCIENTISTS

The following tasks should be carried out during 1979-1980:

Task	*Country*
Tagging, eastern Atlantic	Spain
Tagging, western Atlantic	U.S.A.
Ageing large fish	France, U.S.A.
Parasite & microspectrometry	U.S.A., France, Spain
CPUE indices of large fish abundance in the N.W. Atlantic	Canada, Japan
Studies of the biology of medium-sized fish	Japan, Spain
Larval studies	Spain

12-d. ALBACORE

d-I. REVIEW OF CURRENT RESEARCH

In response to the recommendations made by SCRS in 1978, numerous studies were done and can be summarized in two ways.

d-I.1. Data and statistics

Task I: Several documents conducted analyses to improve the quality of Task I statistics, particularly their distribution by area, North or South Atlantic. Documents SCRS/79/15, 28 and 53 examined the North-South distribution of major longline catches based on different sampling methods including logbook records and port sampling. Document SCRS/79/68 updated and revised the surface catches from North Atlantic including catches of Spain and France.

An effort to collect and revise Task II data including catches and biological sampling was carried out. Useful gear strata -- longline, troll, baiboat and time-area strata -- month, quarter, and 5° x 5° and 1° x 1° squares were considered by fishery and the sampling coverage (SCRS/79/68).

d-I.2. Research

Fishery research cruises in the North Atlantic were continued (SCRS/79/47), including systematic tagging effort and the publication of all tagging results (recapture data collected for ten years (SCRS/79/48)).

Considering stock separation, a revision of data collected on the heterogeneity of the northeast Atlantic stock, based on all available information (size frequencies, serological studies, growth rates, potential spawning areas and periods) (SCRS/79/70) resulted in a summarization of the probable migratory routes in the northeast Atlantic (SCRS/79/71).

The basic growth rate parameters were studied using size frequency data from both the surface fishery (SCRS/79/35), and on the entire stock (surface + longline) by using new techniques of ageing dorsal fin ray sections of both juveniles and adults (SCRS/79/69). Differential growth by sex and the stage of maturity was taken into account in the evaluation.

Concerning stock evaluation, an original "multi-cohort" analysis (SCRS/79/107) applied to the surface fisheries data allowed a complete historical analysis of the data, particularly for the estimation of recruitment levels and the state of the stocks (SCRS/79/68).

Potential yield under different exploitation schemes was estimated with the help of a simulation model (SCRS/79/68).

In accordance with recommendations of the SCRS, efforts were made to further define the stock-recruitment relation (SCRS/79/68 and 86) and to estimate confidence intervals for likely spawner-recruit relations including estimates of recruitment failure (SCRS/79/86).

d-II. REVIEW OF FISHERIES DATA

d-II.1. Catch trends

Atlantic-wide albacore catches have increased from 10,000 MT in 1940 to a peak of about 88,000 MT in 1965. Since 1965 (Table 6) catches have stabilized at approximately 70,000 MT per year, with the exception of 1971 and 1972, when catches increased to approximately 80,000 MT, and 1975 when catches totaled only 62,000 MT. There are few preliminary data available for 1979.

Both longline and surface fisheries exploit the North Atlantic stock. Catches from this stock fluctuated between 40,000 and 50,000 MT since 1966 (Table 6). Surface fishery catches have slowly decreased while fluctuating from 40,000 MT in the 1960's to 27,000 MT in 1973. From 1974 until 1978, surface fishery catches have remained relatively stable at approximately 30,000 MT.

North Atantic longline catches have increased from a few tons in 1956 to a high of approximately 16,000 MT between 1963 and 1965. Catches then declined to between 4,000 MT and 9,000 MT from 1966 to 1970. From 1971 to 1976 catches increased erratically to approximately 20,000 MT. Catches in 1977 and 1978 decreased to 17,000 MT and 12,000 MT, respectively. However, there are some uncertainties concerning the exact separation of longline catches from the north and south stocks. These uncertainties are due to the fact that the longliners fishing albacore are sampled by both ICCAT-contracted personnel, and Taiwan University. The coverage rate of the ICCAT survey at landing ports is from 40 percent to 80 percent (SCRS/79/15). However, Taiwan University estimated the same catches of these longliners based on logbooks, with a coverage rate of 20 percent to 40 percent (SCRS/79/28).

These two calculation methods can introduce biases. This would affect the validity of the data cited for 1977-1978. The SCRS has estimated that the actual catch was intermediate to those of either data source (Table 6).

Longline catches from the south stock have increased from several tons in 1956 to more than 30,000 MT in 1965. From 1966 to 1972, catches have fluctuated and reached a peak of 41,000 MT in 1972. From 1973 to 1977 longine catches remained stable at approximately 20,000 MT. The catch for 1978 is 19,000 MT. However, as mentioned above, the separation of catches between north and south is not perfect (SCRS/79/28).

d-II.2. Effort trends

In the past years, surface effort in the North Atlantic has decreased. From 1975 to 1978 troll effort decreased approximately 30 percent in relation to the 1970-74 period. Baitboat effort decreased about 40 percent since 1972 (SCRS/79/68).

Longline fishing effort on the north stock has almost doubled from 1970 to 1977 (SCRS/79/53). Longline fishing effort on the south stock is presently increasing but is still 5 percent less than the record fishing effort of 1972-73.

d-II.3. Catch rate trends

Figure 15 shows progressions of abundance of fish from each age of fish from year to year in the French-Spanish troll catch for the period from 1957 to 1978.

Figure 16 shows the CPUE for the French-Spanish baitboat and troll fleets from 1965 to 1978. The baitboat data show two distinctive abundance periods during this sequence, the first ending in 1973, and the second period with a higher overall abundance starting in 1974, which declines to levels representative of peak years in the earlier period. The troll CPUE in Figure 16 similarly appears to have two stanzas. The higher overall CPUE period starts in 1977 but is more variable than the earlier period.

Longline CPUE for the north stock indicates a slow and continuous decrease which began in 1958 (Fig. 17-a). CPUE in 1977 was the lowest on record. The south stock CPUE, after a long decrease between 1958 and 1973, has increased some since 1974 (Fig. 17-b) (SCRS/79/53 and SCRS/79/86).

d-III. STOCK STRUCTURE

Traditionally, it is considered that there are two Atlantic albacore stocks, north and south. ICCAT statistical division takes this into account and the two stocks idea is accepted by most experts. Sporadic exchanges between the stocks, however, are not excluded. There is also a possibility of some exchanges between Indian Ocean and South Atlantic albacore.

Documents SCRS/79/35 and 70 presented interesting comments on the fine structure of the north Atlantic stock based on biometric and serological measures. It was hypothesized that young albacore show several different migratory routes into the eastern Atlantic fisheries, while the adults are taken over large areas and no specific migratory patterns have been found for them.

However, document SCRS/79/71, concerning tagging, showed a trend for fish from the western migration route (Azorian) to join the fish which migrate east (Catabrian). This trend increased with age of fish. Finally, Fig. 18, taken from the same document, indicated that at adult age these albacore also appear in the Canarian zone (winter baitboat fishery) as well as in the central Atlantic (longline fishery). Therefore, a mixing of fish at adult stages from each migratory route can be considered.

Finally, an exploratory cruise in the northwest Atlantic indicated the presence of large albacore which are usually caught by longline at the surface in this area (SCRS/79 47). This cruise, as well as the two preceding ones, confirmed that young albacore migrate in summer, essentially to the northeast Atlantic.

It does not seem imperative to re-examine the existence of two large north and south stocks each with its own reproductory potential.

d-IV. POPULATION PARAMETERS

d-IV.1. Growth

The growth of North Atlantic albacore was reviewed in SCRS/79/69. The results indicated a decrease in the growth rate at sexual maturity, especially in females (Fig. 19). It should also be noted that according to this curve, juvenile growth could be very rapid the first year. Observations made on the growth of young albacore presented in SCRS/79/35 do not contradict this.

The impact of this difference in growth by sex on stock evaluation techniques has been tested by simulation modeling. It appears that calculations of the actual exploitation rates as were made in SCRS/79/68 are not sensitive to the changes in growth. However, this hypothesis on sex differentiated growth, even if taken into account, does not fully explain the disequilibrium sex ratio observed in the adult albacore fisheries.

This disequilibrium may need an explanation of difference in ecology between the adult males and females, such as a larger natural mortality rate for females, or an area where females are not available to fishing gears. In either case, conclusions on the status of stock exploitation would be affected. It is desirable to determine systematically sex ratio as a function of size for each adult albacore fishery. It seems useful to also verify whether these sex-ratios vary according to fishing effort.

d-IV.2. Mortality

Concerning natural mortality, no new information has been presented. The traditional estimates still appear to be M = 0.2 from 1 to 4 years, M may then increase progressively until M = 0.8. A new multi-cohort analysis was used to evaluate fishing mortality and the resulting recruitment. It was described in detail in SCRS/79/107. This analysis was based on the simultaneous analysis of several cohorts, using two age-classes that are continuously being exploited by the same gear. The catchability of these cohorts was assumed to maintain a constant relationship. Moreover, this assumed variation of fishing efforts that were exerted on the stock to catch the cohorts that are being considered. These conditions are all fulfilled by the troll fishery directed to ages 3 and 4. In addition, the good data available for this fishery warranted the success of this method. Consequently, no reference had to be made to the less precise longline fishery statistics.

Fishing mortality for recent years was calculated by this method. A decrease of fishing mortality for young fish aged 3 and 4 can be observed. Mortality has changed from .8 to .3 between 1967 and 1976 and has maintained at this low level since then. On the contrary, adult fishing mortality for age 5 to 10 increased from 0.1 to 0.2 in 1970 to 0.3 to 0.5 in 1976.

Fishing mortality estimates which were obtained from application of the new multi-cohort analysis indicated that the mortalities for the surface and longline fisheries are less than previously estimated. Due to higher escapement from the surface fishery, the changes in mortality estimates from the longline fishery appear to be even greater than those of the surface fishery.

d-V. STATUS OF STOCKS

d-V.1. Production model analysis

No production model analysis was presented this year for either stock. Production models presented in 1978 were considered. These models did not include the longline data under discussion for 1977 and 1978. It is evident that their insertion could modify the conclusions.

It was estimated in 1978 that the south stock has an MSY of 30,000 MT (Fig. 21). This is approximately a third more than the catch of past years. The north stock is currently being exploited at MSY level, which is 50,000 MT (Fig. 22).

d-V.2. Yield-per-recruit analysis

d-V.2.i. North stock

A yield-per-recruit analysis was presented for the north stock (SCRS/79/68). Calculations were made using catchability values by age and gear indicated in Fig. 20. Calculations were made for two equilibrium stock states corresponding to fishing effort from 1960 to 1972 and from 1973 to 1979, respectively. The major conclusion was that the redistribution of fishing effort towards larger fish would allow us to expect an increase in yield-per-recruit from 3.29 to 4.07 kg/recruit. These figures are for equilibrium fisheries.

This result agreed with the analysis presented last year in SCRS/78/77. This analysis also predicted the possibility of an increase in yield-per-recruit.

d-V.2.ii. South stock

No yield-per-recruit analysis was presented for the south stock. It seems that the conclusions reached in 1978 are still reliable (1978 SCRS Report, p. 136). This means that there is little increase in yield-per-recruit that can be obtained from an increase in size-at-first-capture because of the exclusive fishing of large albacore by longliners.

d-V.3. Recruitment analysis

d-V.3.i. North stock

1. Recruitment index

There are two recruitment indices currently used:

– CPUE of French trollers on year-classes 2, 3, 4 and 5 (Table 9 of SCRS/79/68) - Figure 15; and

– Estimated number at age 2 from cohort analysis (as described in SCRS/79/107) - Figure 25.

From Figure 25 there appears to be a good correspondence between the CPUE index and the calculated recruitment numbers (1963-1975 average recruitment = 13 x 10^6; maximum = 20 x 10^6). The CPUE recruitment series from 1963-1975 shows large variability and no marked trends up or down. The index estimated numbers of age 2 recruits and showed large variability with a modest declining trend.

2. Spawner-recruit relationship

Two spawner-recruitment (S/R) relations, Beverton-Holt (Fig. 24) and Ricker (Fig. 23) were presented to the Committee. The first S/R relation used a R in numbers at age 2 from cohort analysis and a S index based on longline CPUE. The second S/R relation(s) used CPUE of ages 2 and 3 from the French troll fleet on longline CPUE smoothed by a moving average of 2. The shifting of the age of the R index does not appreciably change the results (Fig. 23). The following conclusions resulted from the analyses:

– The variability reported last year is confirmed in this year's analysis.

– Depending on the index used the recruitment is variable and stable (CPUE index) or variable with a modest downward trend (estimated recruitment from cohort analysis).

Depending on the length of the data series used, the recruitment corresponding to the current parent stock level is about 60 percent of the maximum average predicted value.

– The current parent index appears to be about 20 to 40 percent (depending on the data series used) of the index level existing in the 1950's.

– There still exists a possibility of a very weak cohort; however, the probability appears to be low, about 7-15 percent (Fig. 26).

d-V.3.ii. South stock

No spawner-recruit index has been developed for the south stock.

d-V.4. Current appraisal

d-V.4.i. South stock

No data presented this year permit us to change the conclusions obtained last year. The south stock appears to be producing catches below the MSY and does not seem to be over-exploited.

An increase in fishing effort could lead to a small increase in catches even though

the actual level of effort is near that which previously produced MSY level catches.

d-V.4.ii. North stock

The analyses presented this year indicate that some of the concerns previously expressed are eased. Yield-per-recruit analyses indicate that the stock is heavily exploited but that due to a modification in fishing effort, yield-per-recruit could be increasing.

Variability of albacore recruitment observed last year is confirmed. However, it seems that the decrease of the abundance index of the parental stock in relation to its initial level in 1950-57 is less than was previously estimated. This decrease is between 60 to 80 percent, depending on the data series used.

d-VI. EFFECTS OF REGULATIONS

There are no regulations in effect for Atlantic albacore.

d-VII. RECOMMENDATIONS

d-VII.1. Statistics

d-VII.1.i. Surface fishery

It is still necessary to have a detailed analysis of the Portuguese fishery in the Azores and Madeira. In particular, it would be useful to receive catch, effort and age structure data for past and recent years.

d-VII.1.ii. Longline fishery

The exact distribution of longline catches exploiting the north and south stocks must be clarified. This can be done by a joint effort of the Secretariat and national scientists of concerned countries. Particularly, some information indicated a shift of the landing places of longliners to Uruguay and Venezuela. It seems necessary to intensively sample these areas. Therefore, the SCRS recommended that the Secretariat examine the possibilities of such action.

d-VII.2. Research

– A production model analysis is needed for both the north and south Atlantic stocks. The impact of the different distribution of the disputable catches on each stock should be evaluated.

– Sex ratio measures, in relation to size in the adult albacore, should be carried out systematically for various fisheries. This would perhaps permit us to understand the male and female ecology and eventually explain the different availability of each sex to longline gear.

– Although some answers have been obtained about recruitment level and stock recruitment relationships, it seems necessary to continue research on these matters.

d-VII.3. Management

Last year the SCRS expressed its concern to the Commission concerning the North Atlantic albacore stock, particularly its recruitment. Consequently, the Commission's attention was drawn to three types of management measures. The text of these measures and the considerations that resulted are as follows:

"i) Measures to increase the yield-per-recruit by increasing the effective size-at-first-capture.

ii) Measures to increase the abundance of the spawning stock.

iii) Measures that might have to be introduced very rapidly to preserve the stock if there should be a recruitment failure." (Biennial Report, 1978-79, Part I, p.140 English version).

Following the results presented this year and discussed in the preceding paragraphs, it seems that there is less cause for concern this year than in past years because (i) yield-per-recruit may have increased, (ii) recruitment has apparently improved and the probability of a very weak recruitment appears to be low. However, the spawning stock has either not changed, or may have declined further. The Committee has no specific management recommendations, but the Commission should be prepared to consider management actions if upon re-analysis the status of either recruitment or adult stock appears to worsen.

12-e. BIGEYE

e-I. REVIEW OF CURRENT RESEARCH

The Committee reviewed fifteen documents on Atlantic bigeye tuna research. Documents are in three categories: biology, fishery data and stocks assessment.

e-I.1. Biology

Basic biological bigeye tuna research included analyses of stomach contents (SCRS/

79/32, feeding behavior (SCRS/79/41), spawning activity (SCRS/79/37), tagging experiments (SCRS/79/48) and length-weight relationships (SCRS/79/39). The last three documents commented on stock structure.

Growth was examined using fin ray sections (SCRS/79/40) and modal progression (SCRS/79/77) analyses. Two documents reviewed general bigeye biology (SCRS/79/26) and past U.S.S.R. bigeye research (SCRS/79/42).

e-I.2. Fishery data

Catch and effort statistics for surface fisheries in the eastern equatorial Atlantic were discussed (SCRS/79/26). Catches for Tema-based baitboat (SCRS/79/61 and 116) and FISM purse seine (SCRS/79/52) fleets were presented. Longline fishing intensity on bigeye was estimated (SCRS/79/62).

e-I.3. Stock assessment

Two documents described results of cohort analysis of longline fishery data (SCRS/79/33 and production model analysis (SCRS/79/63).

e-II. REVIEW OF FISHERIES DATA

e-II.1. Catch trends

Total Atlantic bigeye tuna catch increased from 19,000 MT in 1966 to a record high of more than 58,000 MT in 1974, then decreased to 44,000 MT in 1978 (Table 7). The longline catch has been the primary component of total catches. Recent high catches in the tropical fishery are due largely to increased surface fishery catches.

In recent years estimated North Atlantic catches have been larger than South Atlantic catches, approximately 1.5 times larger on the average during the most recent five years (SCRS/79/63). The longline fleet operates in the entire Atlantic. The major North Atlantic surface fisheries are the Spanish (Canary Islands) and Portuguese baitboat fleets operating in the northeastern region. The major South Atlantic surface fisheries are the Gulf of Guinea purse seine and baitboat fleets.

Reported catches by eastern Atlantic surface fisheries are inaccurate due to misidentification of bigeye as yellowfin tuna and vice versa (SCRS/79/26). Information presented to the Committee enabled adjusting bigeye and yellowfin catches (Table 7).

e-II.2. Effort trends

Effective total Atlantic longline fishery effort for bigeye tuna increased during the period 1957-1975, to a peak in 1975 of 1.7 million hooks per 5^{o} square. In 1976

and 1977 effort decreased to 1.4 and 1.2 million hooks (SCRS/79/62). In the North Atlantic, effort followed a similar pattern, reaching a peak in 1975 of 2.1 million hooks and decreasing to 1.1 million hooks in 1977.

In the South Atlantic longline effort increased during the period 1959 to 1971, then remained between 1.0 and 1.4 million hooks per 5° square during 1971-77.

Nominal effort, during the peak bigeye season for the Canary Islands baitboat fishery has remained relatively constant in recent years (Table 8). With the exception of this fleet, no good measure of bigeye tuna fishing effort is available for surface fishery fleets primarily because the bigeye tuna catch is incidental to yellowfin and skipjack fishing. However, judging from increased catches of tropical tuna in recent years, effort for bigeye has probably increased.

e-II.3. Catch rate trends

Annual longline bigeye tuna hook rates (CPUE) were estimated from Japanese and Taiwanese fleet catch-effort data (SCRS/79/62). For the entire Atlantic, CPUE decreased to an all-time low in 1976 (Fig. 27). In 1977, CPUE increased by more than 20 percent. CPUE's for the North Atlantic fishery mirror those for the entire Atlantic (Fig. 28). In the South Atlantic, longline CPUE decreased between 1961 and 1966, increased between 1967 and 1969, then decreased, stabilizing at a lower level between 1972 and 1977 (Fig. 29).

Canary Islands-based baitboat CPUE decreased from 0.42 MT/day in 1975, to 0.24 MT/day in 1976, then recovered to 0.30 MT in 1978 (Table 8). CPUE for other surface fisheries is not available.

e-III. STOCK STRUCTURE

Information on bigeye tuna spawning areas was presented (SCRS/79/37). The document noted that bigeye spawn in two areas, in the Gulf of Guinea with peak spawning in the period January-February and in the northwestern tropical Atlantic in June-July, suggesting the possibility of two spawning stocks; one in the north, one in the south. This agrees with previous evidence. On the other hand, distributions of bigeye catches by longline and surface fisheries are continuous in equatorial areas suggesting a single Atlantic stock. Since the true Atlantic bigeye tuna stock structure is unknown, the Committee has used two hypotheses in stock assessments: (1) a single Atlantic stock, and (2) two independent stocks separated at approximately 5°N.

e-IV. POPULATION PARAMETERS

Bigeye tuna age and growth was studied by examining sectioned first dorsal fin rays (SCRS/79/40) and modal length frequency progressions (SCRS/79/77). Although these studies estimated maximum size (L_{∞} or W_{∞}) much higher than actually observed,

results are similar to those reported by Champagnat and Pianet (1973) for the size range of fish commonly taken by the fishery. The resulting growth curve is given in Fig. 34. The rate and linearity of the curve is notable.

No new information on other population parameters was presented to the Committee. A coefficient of natural mortality of 0.4 and 0.5 is assumed for Atlantic bigeye tuna, following the practice of previous years.

e-V. STATUS OF STOCKS

e-V.1. Production model analysis

e-V.1.i. Total Atlantic stocks

The generalized production model was fitted to updated catch and effort data for the period 1961-1977 (SCRS/79/63). Two surface fishery data sets were used: reported catch (ICCAT "Statistical Bulletin, Vol. 8") and estimated catch (SCRS/78/31). Fishing effort was expressed in terms of longline effective hooks estimated using longline CPUE. There was no substantial difference in estimates using the two data sets and the following discussion refers to analyses using the reported catch series. Although new surface fishery catch estimates for the years 1961-1978 were made subsequent to the analysis (Table 7), these changes would not seriously affect the results.

Estimated MSY is 48,000 MT for the m = 2 form of the model, 53,000 MT for the m = 1 form and 100,000 MT for the asymptotic, m = 0 form (Fig. 30). Objective criteria fail to indicate any of the three models as best.

Recent marked increases in surface fishery catches have resulted in a change in the exploitation pattern. The average size of fish taken in surface fisheries is less than that taken in the longline fishery; the Gulf of Guinea baitboat fishery in particular catches small fish. This change in exploitation pattern may affect the relation between fishing effort and sustained yield, as estimated by a production model. This may alter the estimate of MSY, and the fishing effort corresponding to optimum level.

e-V.1.ii. North Atlantic stock

Bigeye fishery data were separated into northern and southern fisheries and the production model was fitted to each group. As in the Atlantic analysis, two data sets were used in the northern Atlantic analysis (SCRS/79/63).

Results were essentially the same using both data sets; results using the reported catch series were described (Fig. 31). Estimated MSY was 35,000 MT for the m = 2 form of the model, 40,000 MT for the m = 1 form and objective criteria fail to indicate the correct model. Recent effort levels are below those corresponding to MSY.

e-V.1.iii. South Atlantic stock

The production model was fitted to South Atlantic catch and effort data. This fishery was assumed to include the longline fishery, Tema-based baitboat fleet and FIS and Spanish purse seine fisheries. Two data sets were used as done for Atlantic and North Atlantic cases and results of fitting the models are similar; results using the reported series are documented. Estimated MSY is 17,000 MT for the m = 2 form of the model, 18,000 MT for the m = 1 form and 30,000 MT for the m = 0 form (Fig. 32). As in total Atlantic and North Atlantic cases it is not possible to objectively choose the best model from the three.

In all model results, if either m = 1 or 2 (form) is the true model, the fishery is operating at levels close to MSY and further increases in effort would only slightly increase sustainable yield. If the m = 0 form is the true model, further increases in effort could double sustainable yield. Until the fishery operates at effort levels in excess of current levels the true shape of the model, and MSY, will not be known and the above results are provisional.

e-V.2. Yield-per-recruit analysis

No new yield-per-recruit analyses were presented. However, a previous analysis, SCRS/77/81, can be used to assess the effects of altering the parameters (Fig. 33).

Results suggested that for instantaneous fishing mortality between 0.1 and 1.4, increasing age-at-first-capture to ages greater than 1 would increase yield-per-recruit (Table 9 and Fig. 33).

Increasing age-at-first-capture will be more effective in increasing yield-per-recruit if the fishery is operating at higher fishing mortality rates.

As noted in the 1978 SCRS Report, the Atlantic bigeye tuna fishery can be divided into at least three groups, each harvesting particular, and at least partially non-overlapping, ages. However, the analysis presented is a non-fishery-specific, non-age-specific form rather than the more appropriate fishery- and age-specific form. Therefore, estimated increases in yield-per-recruit to be gained from increasing age-at-first-capture must be considered provisional. The Committee suggested the more detailed analysis be performed.

Yield-per-recruit analyses for separate north or south Atlantic stocks are not available.

e-V.3. Recruitment analysis

No series of direct recruitment indices (e.g. CPUE of age 1 fish) is available for Atlantic bigeye tuna. However, cohort analysis estimated number of age 1 fish for various combinations of natural mortality and initial fishing mortality rates suggest that between 1967 and 1973 recruitment was moderately variable about an average; no general trend is evident (SCRS/79/33). There is no information concerning trends in subsequent years.

The available analysis considers only longline catches: surface fishery catch data not

available to the authors were not taken into account. Until the analysis is redone using the complete data set, results must be considered provisional. No separate northern and southern stock analyses are available.

e-V.4. Current appraisal

e-V.4.i. Total Atlantic stock

Results of 1979 production model analyses are the same as in 1978 and suggest that the stock is currently exploited at a high level. The present fishing effort is probably near the level corresponding to estimated MSY. Further increases in fishing effort with current fishing patterns would probably result in only marginal increases in yield.

Results of the available yield-per-recruit analysis indicate that increasing age-at-first-capture would increase equilibrium yield-per-recruit. Identified increases are tentative.

The feasibility of increasing age-at-first-capture especially in the Tema-based bait-boat fleet is uncertain. Since small bigeye tuna are often taken with skipjack in mixed catches any increases in bigeye yield due to increasing bigeye age-at-first-capture may be more than offset by decreases in skipjack yields.

Implementation of regulations increasing bigeye age-at-first-capture will have the effect of re-allocating catch from surface to longline fisheries.

e-V.4.ii. North Atlantic stock

Essentially the same conclusion on the current stock status was reached as at the 1978 SCRS. The current fishery is believed to be operating at a level slightly below that giving MSY. Increased effort with the same pattern of fishing would probably result in some increase in sustainable yield. However, the actual yield will depend on the sizes of fish caught. If there is an increase in the number of small fish taken, the yield can be expected to be less than it would be if catches are predominately of large fish.

e-V.4.iii. South Atlantic stock

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

e-VI. EFFECTS OF REGULATIONS

No regulations are in force for bigeye tuna.

e-VII. RECOMMENDATIONS

e-VII.1. Statistics

Misreporting of bigeye and yellowfin tuna in catch statistics (Task I), while somewhat alleviated, continues to be a problem. The Committee recommended further effort be made to ensure accurate species breakdown of catches. Sampling should be emphasized at landing ports used by fleets catching significant numbers of juvenile tuna, such as FISM, Spanish and Tema-based tropical surface fleets. Sampling at transshipping ports such as Puerto Rico should be continued.

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

The Committee recognized the need to improve catch, effort and size frequency data, and recommended that countries whose statistics have not been presented adequately be encouraged to collect and submit these data and to investigate the possibility of estimating previously unavailable, past years' data.

e-VII.2. Research

Among those research projects which would provide information useful to bigeye tuna stock assessment, the Committee identified the following:

i) Tag-recapture studies should be conducted to estimate age growth parameters and mortality rates.

ii) Studies on migration rates and paths are needed, as the stock structure of bigeye tuna remains uncertain.

iii) Recruitment indices should be investigated. One needed analysis is a cohort analysis using data from all fisheries taking bigeye.

iv) Effects on various fisheries and stocks of establishing a common yellowfin/bigeye tuna minimum size limit should be investigated. Such research should include fishery and age-specific yield-per-recruit analysis.

Additional research projects could address aspects of mixed bigeye-skipjack/yellowfin tuna surface fisheries.

e-VII.3. Management

Previous SCRS reports have noted that a minimum size limit for bigeye tuna would benefit (1) the bigeye stock, by increasing yield-per-recruit and (2) the yellowfin stock, by helping to eliminate under-sized yellowfin being landed and reported as bigeye tuna.

To address this issue, in 1977 the SCRS recommended a common bigeye/yellowfin size limit of 3.2 kg.

Because of practical problems that would require solving if the recommended size

limit were introduced for bigeye, the Commission asked the SCRS to study the matter further. It posed three specific questions (p. 71 of the 1977 Biennial Report).

i) The Commission's first question was "Can the fisheries now catching small bigeye successfully shift this effort to older age groups?" Preliminary analysis suggests the Gulf of Guinea baitboat fishery would have difficulty in changing the nature of its operation to avoid incidental capture of small bigeye tuna (SCRS/79/61). Whether or not Gulf of Guinea purse seine operations could be altered to avoid bigeye tuna less than 3.2 kg is unknown. To answer this question, data on bigeye fish size composition by school is needed. Though some progress on assembling these data has been made, data sufficient to answer the question are not yet available. Time and area distribution of small bigeye and yellowfin tuna is now being investigated; this could help to answer this question.

ii) The Commission's second question was "Would there be any effect on recruitment (of implementing a minimum size limit)?" Spawner-recruit analyses to address the effect on recruitment of age-1 fish have not yet been performed. The available yield-per-recruit analysis suggests that a size limit would increase biomass of fish of sizes greater than that limit, and this could provide a larger spawning potential which might result in higher abundance of juvenile recruits. However, it is difficult to predict either the effects of increased effort on larger age-classes, or subsequent recruitment. However, the Committee would like the Commission to consider this question, and clarify their intentions.

iii) The Commission's third question was "Would implementing a size limit result in substantial wastage through dumping?" Preliminary results indicate that about 83 percent in number (or about 62 percent in weight) of the Tema-based baitboat bigeye catch are under 3.2 kg. in weight. If catch is similar to 1976-78 levels in the future, then discards could be significant. Data necessary to more completely analyze the discarding problem are not yet available.

In 1977 the SCRS recommended a common bigeye/yellowfin size limit of 3.2 kg. It should be emphasized that this minimum size value is primarily based on analyses of yellowfin tuna. Analyses for bigeye tuna, while not being in the depth of those for yellowfin tuna, indicate that the application of this limit would result in an increase in yield-per-recruit for bigeye tuna although it may not be to the optimum yield-per-recruit level.

The Committee reiterated its recommendations for a minimum size limit of 3.2 kg, since this value would, if enforced effectively, facilitate the application of the yellowfin tuna regulation and increase yellowfin tuna yield-per-recruit and approach an optimum for bigeye tuna yield-per-recruit.

However, the Committee also realized the serious problems that such a regulation would raise for certain major fisheries (SCRS/79/116). Therefore, the Committee recommended that the study of the effects of applying different management methods (such as time/area regulations, closure of the fishery with restrictions or exceptions for certain gears) should be conducted immediately.

e-VIII. EVALUATION OF PROGRESS MADE ACCORDING TO THE ASSIGNMENTS MADE IN 1978

Tasks	*Status*
1. Production model update	Completed
2. Cohort analysis	Partially completed
3. Size/age composition	Partially completed
4. Yield-per-recruit analysis	Not completed
5. Analysis of impact of regulations	Partially completed
6. Study of proportion of under-sized fish	Partially completed
7. Investigation of variability in recruitment	Partially completed
8. Estimation of effective effort in multi-species fishery	Not completed

12-f. BILLFISHES

f-I. REVIEW OF CURRENT RESEARCH

Research on billfishes over the past year concentrated on some of the basic questions raised by the analyses presented at last year's meeting. The status of stocks of blue marlin and white marlin was updated (SCRS/79/79) and several documents addressed the problems associated with estimating effective effort and determining indices of abundance which account for changes in target species of the longline fleets and the incidental catch problem (SCRS/79/64, 78 and 79). Additional research on the status of stocks of sailfish and spearfish was conducted (SCRS/79/93) and the size and possible origin of sailfish from the eastern Atlantic were investigated using length frequency and oceanographic data from the eastern Atlantic and Indian Oceans (SCRS/79/96).

Several documents dealt with various aspects of research on swordfish. SCRS/79/97 summarized the biology, ecology, and population dynamics of swordfish using the FAO species synopsis format; SCRS/79/36 developed an age-length relationship for tropcial Atlantic swordfish from analysis of the Petersen curves and polymodal frequency distributions, and compared the results with previously reported age determinations; SCRS/79/87 reported findings on the distribution and abundance of swordfish larvae in the Gulf of Mexico based on ichthyoplankton surveys conducted in 1977 and 1978; and SCRS/79/43 presented results from an analysis of the gonad development of female swordfish landed by longliners off Brazil. A review of the results of Soviet research over the past twenty years on the biology and ecology of swordfish, sailfish, blue marlin and white marlin was also presented (SCRS/79/42). Size, feeding, reproduction, and migration characteristics were given and general conditions under which commercial aggregations form were outlined.

f-II. REVIEW OF FISHERIES DATA

f-II.1 & 2. Catch and effort trends

f-II.1.i. Blue marlin

Landings of blue marlin from the Atlantic Ocean in 1977 were 2,014 MT, a 48 percent increase over the previous year, but a 40 percent reduction from the previous 10-year average (Table 10). Landings were distributed among Taiwan (38 percent), Korea (25 percent), Cuba (16 percent), U.S.A. (15 percent), and Japan (7 percent). In the North Atlantic, 1,300 MT were landed, about half of the previous 10-year average (Table 11). Effective fishing intensity, estimated from Japanese indices of abundance (see section f-II-3), increased by about 50 percent in both the total Atlantic and the North Atlantic alone.

f-II.1.ii. White marlin

Landings of white marlin in 1977 from the Atlantic Ocean were 1,177 MT, a 51 percent reduction from the previous year (Table 12). This reduction in catch was about evenly distributed between the North and South Atlantic Oceans. In the North Atlantic, 598 MT of white marlin were landed in 1977, the lowest reported catch since 1961 and about one-third of the average catch over the previous ten years (Table 13). The Atlantic-wide landings were distributed among Taiwan (39 percent), Korea (26 percent), Cuba (16 percent), Japan (9 percent), and U.S.A. (9 percent) in 1977 (Table 12). Effective fishing intensity over the total Atlantic and in the North Atlantic doubled over the previous year and was at an all time high in 1977.

f-II.1.iii. Sailfish/spearfish

Landings of sailfish/spearfish in 1976 (the most recent year used in the SCRS/79/93 analysis) totalled 1,011 MT, a decline of 27 percent from the previous year and about half of the previous 10-year average. This decline continued in 1977 when 870 MT were landed (Table 14). Landings in the western Atlantic are almost always greater than on the eastern side and were about twice as large in 1976. The 1976 landings were distributed among the U.S.A. (26 percent), Taiwan (17 percent), Brazil (17 percent), Korea (16 percent), Japan (14 percent), and Cuba (10 percent). Fishing intensity in the total Atlantic in 1976 declined by about half from 1975 levels and by about 20 percent in the western Atlantic.

f-II.1.iv. Swordfish

The 1977 estimated swordfish landings from the surface fishery were revised during the past year resulting in a revised Atlantic and Mediterranean catch of 12,800 MT in

1977. Reported swordfish landings were 18,700 MT in 1978 (Table 15). This is the highest level of catch ever recorded and is about 50 percent greater than the previous ten-year average. It is also possible that landings are substantially higher than reported in Table 15 since there has been a major resurgence in the U.S. and Canadian fisheries in recent years and much of this catch probably goes unreported. No estimate of effective fishing intensity, similar to those estimated for the other billfishes, is presently available but it appears that the directed effort on swordfish in the U.S. and Canadian fisheries has increased substantially in recent years although no documentation of this increase is currently available.

f-II.3. Catch rate trends

Catch-per-unit-effort (CPUE) indices for all billfishes are computed using catch and effort statistics from the Japanese longline fishery. This is the only fishery for which complete and comprehensive historical data are available. In particular, the Japanese statistics, which are reported by month and by five degree area for all billfishes other than sailfish/spearfish which are aggregated, provide important information on the temporal and spatial changes in density and availability.

CPUE indices of abundance were computed for blue marlin and white marlin (SCRS/79/64 and 79) and for sailfish/spearfish (SCRS/79/93) using Honma's approach* for estimating effective effort from nominal catch and effort statistics. Although different standard year periods were used for averaging historical catch rates in the relative density estimation, the annual concentration coefficients (i.e. the ratio of effective effort to nominal effort) estimated in SCRS/79/64 and 79 were quite similar, especially with respect to the trend over time. Figs. 35 and 36 show the sensitivity of the annual concentration coefficient to the choice of standard year period, for blue marlin and white marlin, where the periods 1965-75 and 1964-72 were used in SCRS/79/64 and 79, respectively. These effective effort estimates were used to compute effective CPUE, and although the CPUE estimates from SCRS/79/64 and 79 varied in magnitude, the trends were nearly the same. The indices of abundance from SCRS/79/79 and 93 are shown in Figs. 37, 38 and 39 for blue marlin, white marlin, and sailfish/spearfish, respectively.

f-II.3.i. Blue marlin

The Japanese catch of blue marlin in the Atlantic Ocean in 1977 was less than half the 1976 level although nominal effort was roughly the same. However, the Japanese concentration coefficient on blue marlin also fell to approximately half the 1976 level (Fig. 35) and consequently, the catch-per-unit-of-effective-effort was nearly the same in 1977. This 1976-77 level, however, is the lowest in the history of the fishery (Fig. 37). In the North

*Honma, M. 1974. Estimation of overall fishing intensity of tuna longline fishery. Bull. 10, Far Seas Fisheries Research Lab., Shimizu 424, Japan, pp. 63-86.

Atlantic, catch, nominal effort, and concentration coefficient levels were significantly lower in 1977. Catch, however, fell off most sharply resulting in an effective CPUE which was the lowest in the history of the fishery. In the south Atlantic, catch and nominal effort increased substantially in 1977 and the concentration coefficient remained unchanged. Effective CPUE increased significantly but only to a level well below the previous ten-year average.

f-II.3.ii. White marlin

The Japanese catch of white marlin in the Atlantic Ocean in 1977 was approximately 20 percent of the 1976 catch and nominal effort was roughly the same. Although the concentration coefficient on white marlin also fell in 1977 (Fig. 36), the reduction was not nearly as great as the reduction in catch and consequently, the effective CPUE fell dramatically to an all-time low (Fig. 38). SCRS/79/79 noted that sample catch and effort statistics from Taiwan, Korea, Cuba, and the U.S. recreational fishery confirm this decline in white marlin CPUE in 1977, although the decline is not as dramatic as the decline in Japanese CPUE from 1976. In the North Atlantic, 1977 catch and nominal effort were significantly below the 1976 level but the concentration coefficient increased for the third consecutive year. The sharp decrease in catch and increase in the concentration coefficient resulted in a dramatic decline in effective CPUE in 1977 to an all-time low level. In the South Atlantic, catch and nominal effort increased substantially in 1977 and the concentration coefficient remained unchanged. Catches, however, increased more sharply than effort, resulting in a significant increase in effective CPUE.

f-II.3.iii. Sailfish/Spearfish

The Japanese catch in the Atlantic Ocean in 1976 was approximately 20 percent below the 1975 level. Nominal effort fell off about 40 percent, and the concentration coefficient on sailfish/spearfish remained roughly the same. Consequently, the effective CPUE increased significantly and continued to exhibit the fluctuating, but overall declining, trend consistent with the previous ten-year period (Fig. 39). In the eastern Atlantic, 1976 catch, nominal effort, and concentration coefficient were all significantly less than the 1975 levels. Effective CPUE decreased slightly, continuing the overall declining trend of the previous ten years, and reaching the lowest level since the late 1950's. In the western Atlantic, 1976 catch was roughly the same as the 1975 level, nominal effort increased by nearly 50 percent, but the concentration coefficient dropped significantly. Effective CPUE increased slightly, maintaining the fluctuating and slightly declining trend of the previous ten years.

f-II.3.iv. Swordfish

No CPUE indices were presented for swordfish.

f-III. STOCK STRUCTURE

Stock structure determination for billfishes has been difficult because available evidence from standard data sources such as larval distributions and tagging experiments are limited. Catch rate distributions have been useful for identifying areas of high density for most billfishes other than sailfish and spearfish where the aggregation of catches in the longline statistics makes the catch rate data difficult to interpret. Available evidence on blue marlin and white marlin shows that although separate concentrations of adults and separate spawning areas and seasons are apparent in the North and South Atlantic, there is also a strong likelihood of considerable intermixing between the two areas. Because of the stock structure uncertainty, the analyses in SCRS/79/64 and 79 were conducted under two stock structure hypotheses: (1) a single Atlantic-wide stock and (2) two stocks, one in the North Atlantic and one in the South Atlantic. Similarly, the SCRS/79/93 sailfish/spearfish assessment was done under Atlantic-wide and east/west hypotheses, based mainly on tagging data and the coastal nature of sailfish.

Data reported from this year's research which may prove helpful in future stock structure determinations are: SCRS/79/87 reported that in the Gulf of Mexico swordfish larvae were found only on the eastern side and in the straits of Florida, generally close to the surface in the upper 0.5 m layer; SCRS/79/43 reported that the principal swordfish spawning period off Brazil is during the first quarter of the year; SCRS/79/42 reported major swordfish spawning areas off the west African shelf in May and June, in the open waters of the Gulf of Guinea in January through March, and in the eastern part of the Gulf of Guinea in May, October, November and December; and SCRS/79/64 reported that length frequency data from the Japanese fishery consistently shows that the average size of blue marlin and white marlin in the South Atlantic is greater than in the North Atlantic, although the number of fish measured is small prior to 1975 (generally less than 1 percent of the catch).

f-IV. POPULATION PARAMETERS

SCRS/79/42 provided fecundity estimates for sailfish on the west African shelf and in adjacent areas. The absolute fecundity was estimated to be 1.5 - 11.5 million eggs. SCRS/79/36 developed an age-length relationship for swordfish. The mean sizes (length from posterior edge of eye to end of middle rays of caudal fin) for the first eight years of life were estimated to be 65, 90, 110, 140, 150, 170, 200 and 210 cm respectively, but no growth curve was fitted.

f-V. STATUS OF STOCKS

f-V.1. Production model analysis

Production model analysis is generally used for billfish stock assessment. The lack of basic data on age determination, growth, and mortality severely hampers the use of

other traditional population dynamics techniques to augment production model results.

The estimation of reliable indices of abundance is of utmost importance when using production model analysis. SCRS/79/64 expressed some concern regarding the reliability of CPUE indices computed from Japanese nominal statistics, especially with respect to the dramatic decline in white marlin CPUE in 1977, because the Japanese fleet has been concentrating effort temporally and spatially on bluefin and bigeye tunas in the North Atlantic and southern bluefin and bigeye tunas in the South Atlantic. Fig. 40 shows the change in nominal effort from the inception of the Japanese fishery to 1977 for the six ICCAT billfish areas shown in Fig. 41. Conversely, however, SCRS/79/78 showed that in the northern Gulf of Mexico, an area which exemplifies the concentration of Japanese effort in recent years, CPUE indices from the Japanese longline fleet were very similar to indices from the U.S. recreational fishery over the period 1971-78 for white marlin and sailfish. The analysis period covered the periods both before and after the concentration of Japanese effort occurred and the U.S. fishery was a directed billfish fishery over the entire period.

The consensus of the Committee was that although great care must be exercised in using longline statistics to index billfish abundance, it was felt the Honma's approach adequately accounts for temporal and spatial changes in fishing patterns and that the indices of abundance could be considered reliable. The Committee recognized, however, that Honma's approach would not account for changes in catchability due to differences in the manner gear is deployed or baited but these factors were thought to be secondary compared to the temporal and spatial considerations. Finally, the Committee conceded that there are a number of factors in this fishery that are not well understood and that the decline in white marlin CPUE in 1977 may have been amplified to some extent by these unaccounted factors and the unusual concentration of Japanese effort, but based on the data from other countries and the SCRS/79/78 analysis, the downward trend would appear to be valid.

f-V.1.i. Blue marlin

1) Total Atlantic stock

SCRS/79/79 estimated maximum sustainable yield (MSY) to be in the range of 3,980-5,654 MT, depending on the number of significant year-classes assumed to be in the catch and on the form of the production model fitted to the data. The level of fishing intensity needed to produce MSY (f_{opt}) is estimated to be in the range 603,000-884,000 hooks per 5^0 area, for the non-asymptotic models. The yield from the fishery has been below this MSY range since 1972 and with the exception of 1976, the fishing intensity has been above the f_{opt} range since 1969. The 1977 landings were 51 percent of the lower limit of the MSY range and 1977 fishing intensity was 47 percent greater than the upper limit of the f_{opt} range (Fig. 42).

2) North Atlantic stock

SCRS/79/79 estimated the MSY range to be 2,352-3,463 MT and the f_{opt} range to

be 672,000-852,000 hooks per 5° area. 1976 and 1977 landings were well below the MSY range but landings from the previous seven years fluctuated within this range. With the exception of 1976, the fishing intensity has been above the f_{opt} range since 1968. The 1977 landings were 55 percent of the lower limit of the MSY range and 1977 fishing intensity was 26 percent greater than the upper limit of the f_{opt} range (Fig. 42).

3) South Atlantic stock

SCRS/79/79 indicated that it may not be possible to determine the status of the South Atlantic stock using production model analysis. It appears that the entire time series cannot be represented by a single production model since the dynamics of the fishery appear to be different in the early period, 1959-68, than in the recent period, 1969-77 (Fig. 42). Additional variability may be present since 1974 because Japanese effort, which is used to index abundance, was minimal during this period.

f-V.1.ii. White marlin

1) Total Atlantic stock

SCRS/79/79 estimated the MSY range to be 2,768-4,229 MT and the f_{opt} range to be 568,000-979,000 hooks per 5° area. With the exception of 1974, landings have been below the MSY range since 1972 and fishing intensity has been above the f_{opt} range since 1970. A dramatic increase in fishing intensity and a corresponding decrease in landings occurred in 1977. 1977 landings were 43 percent of the lower limit of the MSY range and fishing intensity was 134 percent greater than the upper limit of the f_{opt} range (Fig. 43).

2) North Atlantic stock

SCRS/79/79 estimated the MSY range to be 1,796-2,708 MT and the f_{opt} range to be 1,215,000-1,468,000 hooks per 5° area. With the exception of 1976 and 1977, landings have been within or near the MSY range since 1970 but fishing intensity was above the f_{opt} range in 1974, 1975 and 1977. A dramatic increase in fishing intensity and a corresponding decrease in landings occurred in 1977. 1977 landings were only 33 percent of the lower limit of the MSY range and fishing intensity was 44 percent greater than the upper limit of the f_{opt} range (Fig. 43).

3) South Atlantic stock

SCRS/79/79 estimated the MSY range to be 1,792-2,251 MT and the f_{opt} range to be 667,000-1,284,000 hooks per 5° area. Landings have been below the MSY range since 1966 and although fishing intensity has been within the f_{opt} range in recent years, it was considerably above the f_{opt} range during 1970-73. Landings of 1977 were only 32 percent of the lower limit of the MSY range although fishing intensity was within the f_{opt} range (Fig. 43).

f-V.1.iii. Sailfish/Spearfish

SCRS/79/93 estimated the MSY range to be 1,903-2,534 MT for the Atlantic-wide stock and 779-1,098 MT for the eastern Atlantic stock. No MSY estimates were made for the western Atlantic stock because production model fits were so poor that realistic parameter estimates could not be obtained. Many of the production model assumptions appear to be especially tenuous for the sailfish/spearfish stocks. In particular, it is necessary to assume the two species have similar growth, recruitment, and mortality rates in order to treat them as a species group in the production model analysis. Little supportive evidence for this and other assumptions is available and consequently, production model analysis provides little concrete information on the status of stocks of sailfish/spearfish in the Atlantic Ocean.

f-V.2. Yield-per-recruit analysis

No yield-per-recruit studies were presented for billfishes.

f-V.3. Recruitment analysis

The only data presented which infer changes in recruitment are the length frequencies for blue marlin and white marlin presented in SCRS/79/64. These data show a general increase in average fork length for both species in both the North and South Atlantic. This is consistent with: (1) a general reduction in recruitment; (2) the progression of a large year-class (or year-classes) through the fishery; or (3) a change in availability of marlins by age due to temporal and spatial shifts in fishing effort or in the location where the samples were taken. No conclusion can be drawn at this time and the third possibility should be subject to further investigation.

f-V.4. Current appraisal

Stock assessment work on billfishes is plagued with shortcomings in the data base and with a lack of understanding of some aspects of the basic biology of the fish. It is difficult to make definitive determinations on the status of stocks using production model analysis because of the data problems, and it is not possible to corroborate any production model results with other standard techniques because of the biological problems. It is apparent, however, that production model results are more credible for some species in some areas than for others. This may be because the data are better or that the production model assumptions are less tenuous for certain species in certain areas. This is especially true of environmental factors which can be local in area and affect various species differently. It is important, therefore, to consider the credibility and usefulness of production model results for each species/area combination separately, even though the same data sources and analytical techniques are used for all combinations. Appraisals

of the status of billfish stocks follow, in order of increasing credibility of the results of the production model analysis.

Although no research was presented on the status of stocks of swordfish, the Committee noted a sharp increase in swordfish landings in 1978. It is not clear, however, to what degree this increase is a reflection of increased removals or simply a reflection of better reporting. The Committee further noted that SCRS/77/70 cautions that "previous research in the Atlantic has shown that swordfish may be unusually susceptible to heavy fishing by longline gear as evident by declining catch rates and steadily decreasing average sizes in the Canadian longline fishery in the late 1960's", but no appraisal of the status of the stocks could be made.

Current analysis of the sailfish/spearfish stocks indicates that because of data problems and/or problems with the production model assumptions, no realistic appraisal of the status of stocks can be made under either stock structure hypothesis. Similarly, but for different reasons, no current appraisal of the South Atlantic stock of blue marlin can be made. In this case it appears that the dynamics of the fishery may have changed over time and the available data are insufficient to model the most current period (Fig. 42). Indices of abundance from the Japanese fleet do, however, indicate that population size may have stabilized at a rather low level (Fig. 39). Although reasonable production model parameter estimates are available for the remaining cases, a further breakdown into two categories, based on the strength of the results, is necessary.

The first category, for which results are weaker, contains the Atlantic-wide and South Atlantic stocks of white marlin. Production model results from these two cases are somewhat similar (Fig. 43). The statistical fit of the models is reasonably good in both cases but some of the observed data points do not follow the model in the manner suggested by the underlying theory, especially during the middle and late 1960's. Despite the uncertainty due to the shortcomings of the model, it appears that the Atlantic-wide stock has been at least fully exploited during the past eight years and possibly over-exploited during 1977. The South Atlantic stock appears to have been over-exploited in the early 1970's and the population size may have been reduced, causing the dynamics to change in more recent years.

The second category, for which results are more definitive, contains the Atlantic-wide and North Atlantic stocks of blue marlin and the North Atlantic stock of white marlin. For these cases the models fit the data quite well, especially the blue marlin cases, and the observed data points behave reasonably well with respect to the equilibrium curves and the underlying theory. The results indicate that with the exception of 1976, the blue marlin stocks have been overfished since the early 1970's, stocks may be at a relatively low level, increases in fishing intensity are not likely to produce increases in yield and may, in fact, result in further decreases in yield.

The North Atlantic stock of white marlin appears to have been fished at or near the MSY level from the mid-1960's through the mid-1970's. In 1975, and particularly in 1977, the indices of abundance dropped to the lowest levels observed for this fishery. It is possible that heavy fishing pressure in recent years may have significantly reduced stock size, contributing to the dramatic drop in yield in 1977, despite a dramatic increase in estimated fishing intensity. However, an examination of the Japanese longline statistics, which were used to construct indices of abundance, revealed some major shifts in fishing strategy in

1977 which may bias the index of abundance. Although the method used to calculate fishing intensity generally accounts for temporal and spatial shifts in fishing effort, the 1977 Japanese fishery was extraordinarily unusual. In 1977 most of the Japanese catch and effort occurred in the Gulf of Mexico. Virtually all of the effort was concentrated in the northern Gulf during the first and second quarters of the year. This resulted in an extraordinary concentration of effort away from high temporal-spatial concentrations of white marlin to low concentrations for which the fishing intensity calculations may not have been fully adjusted. Therefore, the 1977 data point for North Atlantic white marlin must be viewed with some reservation at this time.

It is not clear and the available data are not adequate to determine whether the apparent over-fishing which has been observed in the Atlantic-wide and North Atlantic stocks of blue marlin and the North Atlantic stock of white marlin is growth overfishing, which is primarily an economic problem, or recruitment overfishing which may have more serious, long-term effects on the stocks.

f-VI. EFFECTS OF REGULATIONS

No regulations are in force for billfishes.

f-VII. RECOMMENDATIONS

f-VII.1. Statistics

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

i) Catch and effort statistics from all longlining countries should be reported by 5^{0} area and by month for each of the billfish species. If this proves impractical in the near future, then statistics for each species should at least be reported by ICCAT billfish area and by month.

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

iii) Attempts should be made to obtain more complete swordfish landings and effort data now that mercury bans have been relaxed, and some attempt should be made to estimate the amount of under-reporting which occurred during the period when the more restrictive bans were in effect.

iv) Length frequency data for all species should be collected on a regular basis by all longline fisheries.

f-VII.2. Research

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

i) Studies be initiated on age and growth of billfishes to provide accurate data and population parameters for yield-per-recruit studies and cohort analyses;

ii) Further work be done on both the commercial and recreational fisheries for billfishes to determine indices of abundance which account for changes in target species of the longline fleets and the incidental catch problem; and

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

f-VII.3. Management

No management measures were recommended at this time but it was recommended that the blue marlin, white marlin and swordfish fisheries be closely monitored, especially blue marlin, and that serious consideration be given to methods of reducing effort on these species as a precautionary measure in the event that further analysis continues to show over-fishing on the marlins or more definitive concern over the status of swordfish stocks.

f-VIII. EVALUATION OF PROGRESS MADE ACCORDING TO THE ASSIGNMENTS MADE IN 1978

Not all of the 1978 SCRS assignments for future research on billfishes were carried out but several additional studies were conducted and submitted to the 1979 SCRS for use in evaluating the status of stocks.

f-IX. ASSIGNMENTS OF FUTURE WORK TO THE SCIENTISTS

Task	*Country*
1. Update production model analysis for blue marlin and white marlin	U.S.A., Japan
2. Initiate or continue studies on age and growth of blue marlin, white marlin and swordfish	Japan, Canada, Spain, U.S.A.

3. Further investigation on the estimation of effective effort in longline fisheries	Japan, U.S.A.
4. Investigation into the status of stocks of swordfish	Japan, Canada, U.S.A.

12-g. SOUTHERN BLUEFIN TUNA

Southern bluefin tuna has a nearly circumpolar distribution with the primary surface fishery conducted around Australia and the longline fishery extending from 180° westerly across the southern Indian Ocean to the mid-Atlantic off South Africa.

Stock assessment analyses have been made by countries concerned (Australia and Japan) based on the detailed catch and size frequency statistics collected and on the information on biological parameters provided by extensive tagging research. The results were discussed at the Stock Assessment Workshop on Tunas and Billfishes in the Pacific and Indian Oceans (Shimizu, Japan, June 1979).

Annual catches by the Japanese longline fishery increased from about 60,000 fish in 1952 to 1,200,000 fish in 1961 and then declined to 530,000 fish in 1977. Australian annual catches increased from about 20,000 fish in 1952 to about 1,250,000 fish in 1969, declined to 650,000 fish in 1973, and then increased again to 1,400,000 fish in 1977.

Longline fishing effort was small (less than 20 million hooks) in the 1950's. In the 1960's effort increased and reached 80 million hooks for the period 1968-1969. It was nearly stabilized between 90 and 110 million hooks during 1970-1977.

Catch-per-unit-effort for longline has decreased in the 1970's to 20-25 percent of the initial fishing period.

From the current appraisal for the status of stocks, it appears that increasing effort for either or both fisheries (surface and longline) would not result in a substantial increase in catches but might result in less catches because there is some evidence for concern over recruitment of young fish.

Since 1971 the Japanese longline fishermen have voluntarily restricted a further decline in the age at first capture. Australia has taken the regulation of limited entry which became effective in 1976 for purse seiners and this measure has probably held fishing mortality down.

As southern bluefin tuna is a long-lived fish and ageing of older fish is still a problem to be solved, further research on this subject is recommended in order to get a better understanding of stock status based on sophisticated analysis.

12-h. SMALL TUNAS

h-I. REVIEW OF CURRENT RESEARCH

More research was done on small tunas in 1979 than in previous years. The biological aspects of blackfin tuna off northern Brazil were presented along with some annual catch and size frequency statistics in SCRS/79/34. The distribution of blackfin

tuna, bonito, frigate tuna and little tunny, based on stomach contents analysis of long-line-captured fish off southern Brazil, is presented in SCRS/79/56. Distribution of larvae of several tuna species from the Gulf of Mexico (SCRS/79/87) and in the eastern Atlantic off the central African coast* were determined by cruises of research vessels. Other documents presented the reproductive biology of little tunny and *Auxis* spp. (SCRS/79/37), an age and growth analysis of king mackerel (SCRS/79/91) and the physical characteristics of the *Auxis* spp. (SCRS/79/101).

It should be pointed out that previous recommendations for more statistics from various non-member countries resulted in a more accurate picture of the true catch of these small tuna species (Table 16). Continued improvements are strongly encouraged.

h-II. REVIEW OF FISHERIES DATA

Catches of small tunas and tuna-like fishes, excluding skipjack and unspecified species, for 1978 were reported to be 42,600 MT (Table 16). The revised reported catch of small tunas for 1977 was 54,400 MT (Table 16). This is slightly below the previously reported catch of 58,200 MT which was incorrectly cited as 68,000 MT in the text of the Report for the Biennial Period 1978-79 (SCRS/79/18). The change in the 1977 catch was due primarily to the revised catch of frigate tuna. Also, there was a reclassification of the landings attributed to the king and Spanish mackerels (*Scomberomorus cavalla* and *S. maculatus*) with the total *Scomberomorus* landings for 1977 remaining unchanged at 23,000 MT. The apparent decrease in total landings from 1977 to 1978 of these various species should not be considered indicative of the levels of abundance or stock sizes. Some countries have not yet reported 1978 landings. As pointed out frequently in the past, statistics for small tunas have been inaccurate and incomplete. The category of "others" has in the past included unclassified big tunas. The decrease of almost 50 percent from the 1977 to 1978 "others" category is probably due to better species identification, rather than to any decline in catch or stock size. Continued improvements in gathering and reporting statistics by member countries should lead to a further decline in the "others" category. The total reported catches of the small tuna and tuna-like species may increase or decrease depending upon these improvements and almost independent of fluctuations in abundance or stock size.

Table 16 includes the catches reported by many countries that had not appeared in the "Statistical Bulletin, Vol. 9 (2)" (SCRS/79/20).

1. Blackfin tuna (*T. atlanticus*) – Blackfin tuna has the smallest catch of all reported small tuna species, the major landings being made by Brazil and the Dominican Republic. Underestimation for this species may still be occurring.

2. Little tunny (*Euthynnus alletteratus*) – The 1978 landings represent a five-fold increase over the 1977 reported catch. This is due to the catches of Ghana and the Soviet Union, collectively representing 93 percent of the reported catch. In 1978, the landings of little tunny represented the greatest catch of any single small tuna species.

* Caverivière and Suisse de Sainte-Claire, CRO-Abidjan, document in press.

3. Bonito (*Sarda sarda*) – This reported catch is down approximately 40 percent from 1977 (Table 16). The change is due predominantly to the extremely high reported catch by the Soviet Union in 1977.

4. Frigate tuna (*Auxis* spp.) – The reported catch in 1978 decreased to a record low of 3,700 MT, approximately 25 percent of that reported in 1977, which was the highest catch ever reported for this species. This was due primarily to the significantly lower catch reported by Ghana.

5. King mackerel and Spanish mackerel (*Scomberomorus cavalla* and *S. maculatus*) – The reported combined catch of these two species has been approximately 18,000-30,000 MT (Table 16) throughout the past ten years. The decrease in the United States catch from 1977 to 1978 accounted for 70 percent of the total mackerel decrease that year.

h-III. STOCK STRUCTURE

Nothing was reported on this subject.

h-IV. POPULATION PARAMETERS

No report presented studies on this subject.

h-V. STATUS OF STOCKS

No quantitative assessments have been made as to the level of abundance or stock size of any of these species due to the lack of adequate data.

h-VI. EFFECTS OF REGULATIONS

No regulations are in force for the small tuna species.

h-VII. RECOMMENDATIONS

h-VII.1. Statistics

In general, the major problem is the inaccurate and incomplete reporting of statistics. It is therefore recommended that:

i) Attempts be made to more accurately identify each individual species.

ii) Wherever possible, catch, effort and length frequency data be collected and reported.

h-VII.2. Research

It is recommended that studies be initiated on the basic biology of each of these species.

12-i. MULTISPECIES INTERACTIONS

The problems of multispecies, multigear fisheries have been addressed by many concerned scientists over the years. In a 1973 meeting in Rome, ICNAF convened a special working group on this topic which, led by Dr. D. Garrod of the United Kingdom, produced a report in the form of a summary document. It was suggested that the SCRS members familiarize themselves with the material presented in this document, including the relevant references, so that the experiences availed by the report could be used to focus the Committee's efforts to understand the situation in the Atlantic tuna fisheries.

The SCRS discussed the multispecies fishery problems of a biological nature, and several specific areas of study were identified. It is clear that although the interaction of juvenile tunas and their vulnerability to fishing gears may be important fishery-related topics, they may not be the important biological topics. The co-occurrence of juvenile tunas may represent only an effect of their ecological similarity for a relatively short time in their individual life cycles. Some important biological questions would relate to:

i) How long does this close association lasts both prior to recruitment to the fishery and after; and where do they graduate to when they leave the multispecies surface fisheries?

ii) What are the interaction effects (e.g. density dependent parameters)?

iii) How long does each species' individuals remain in the multispecies configuration?

There are many other questions to be asked, but this short list could keep the SCRS scientists quite busy for a while.

The Report of the Joint CECAF/ICCAT Working Group on Juvenile Tropical Tunas (SCRS/79/26) (Abidjan, September 17-21, 1979) provides a review of relevant fishery and biological data availability, and data requirements, as well as a carefully considered discussion of the problems relative to an economic evaluation of the juvenile tropical tuna fishery.

It was pointed out that the small fish (juvenile) fisheries need a good analytical description from a broad perspective (e.g. including artisanal as well as larger commercial activities) before management alternatives could be considered. The Abidjan meeting report indicates that in most cases there are sufficient data to begin this description. It was emphasized that a study of set-by-set activities was required if the species interactions were to be investigated. A very detailed logbook recording system must be implemented in both purse seine and baitboat fisheries if these descriptions are to be truly representative of the species interactions. At-sea sampling of catches also appears to be an

essential requirement in this case. Research results from at-sea investigations provided by Ghana at the Abidjan meeting were uniquely informative regarding the school-by-school variation in species composition.

The available length frequency by 1^{o} square information in SCRS/79/85 provides interesting insights into possible time-area strata in which fishing effort on juvenile tropical tunas might be controlled. The Report of the Working Group on Juvenile Tropical Tunas also gives this topic thorough coverage.

As one can see by examination of section 3 of the Abidjan meeting report (SCRS/79/26), the Working Group's mandates included a consideration of the economic impact of any eventual management schemes which might be developed. However, it was pointed out in SCRS discussions that these topics could only be seriously addressed by SCRS if the ICCAT Convention were expanded to include topics other than the implied fishery science. Only then could ICCAT broaden its expertise to include economics, *per se*. Any specific recommendations regarding this subject should be given careful consideration in deliberations regarding the Commission's intent in assigning research of this nature to SCRS. Also in light of the present Convention, it might be useful to recognize the additional tasks which would be necessarily requested of the member countries if a truly meaningful economic evaluation of management measures is to be undertaken.

The Committee, therefore, recommended that the Commission give careful consideration to the implications of expanding the SCRS mandate to include economic evaluations, as well as the requirement that ICCAT would have to expand its own expertise through consultations and national inputs to any economic models which might be formulated.

Further, it supports any intention of the Commission regarding further development of the basis for decision-making, with results of formal economic analysis if appropriate, which would provide resolution of the problems inherent to the multispecies fishery for juvenile tropical tunas.

Item 13. Report of the Sub-Committee on Statistics

The Sub-Committee on Statistics met on November 10, 1979, and the Report was presented by its Convener, Mr. S. Kume (Japan). The SCRS adopted this Report (attached as Appendix 4) and endorsed all the recommendations made by the Sub-Committee.

Item 14. Report of the Working Group on Data Management

The Convener of the Working Group, Mr. R. H. Pianet (France), presented the report of his group which met during this Session. The report is attached as Appendix 5.

The Committee noted that the final decision on the choice of the data management system is pending on the projected amount of data processing requested by the Skipjack Year Program. The Convener of the Sub-Committee on Skipjack stated that the evaluation of the amount and level of data processing cannot be made until the Sub-Committee studies the development of the Program at a somewhat later time. The Committee recommended that the Sub-Committee on Skipjack finalize this evaluation at the next Sub-Committee meeting and report to the SCRS at its next session.

The Committee adopted this Working Group report and concurred with all the recommendations contained in it.

Item 15. Review of Atlantic tuna statistics and data management system

The Committee felt that most of the subjects to be discussed under this Agenda item have effectively been dealt with by the Sub-Committee on Statistics and the Working Group on Data Management. On the other hand, there were several subjects left undiscussed previously.

15.1. BIOSTATISTICAL WORK

The Committee was informed that the ICCAT Biostatistician, Dr. Max Laurent, had presented his resignation because of personal reasons.

The Committee reviewed the need for a biostatistician in the coming year and noted a list of four major tasks assigned to the Secretariat which cannot be carried out adequately without a biostatistician. Those four tasks are as follows:

i) the improvement of Mediterranean bluefin statistics;

ii) agreement on the data base for the geographical and temporal distribution of catch and effort for longline fleets;

iii) evaluation of a global sampling scheme; and

iv) updating of the bluefin data base.

The Committee studied the pros and cons of having a permanent biostatistician on the Secretariat staff vs. having experts contracted on a temporary basis for short periods. A permanent biostatistician can be continuously involved in the work while temporary experts can be chosen from among the scientists who are most familiar with the problems. Thus, there would be no time wasted in having to brief a biostatistician. Also, a few experts can be contracted simultaneously while a permanent biostatistician has to distribute his work throughout the year. There is some uncertainty concerning the difficulty in contracting experts for a short period.

The Committee fully agreed that the work load at the Secretariat warrants having a full-time biostatistician. Therefore, the Committee authorized the Secretariat to take the alternatives as mentioned above which meet the needs most economically and efficiently.

15.2. LONGLINE CATCH DISTRIBUTION

Concern was expressed about the major discrepancies that exist within the longline data base derived from various sources. These observed discrepancies in geographical and temporal distributions in catch and effort can alter the conclusions based on which the data base analyses are made. The Committee considered that this problem has been discussed throughout the SCRS sessions under the various Agenda items and should be solved as early as possible. The Committee recommended that the Secretariat make an extensive study of the problem and attain a common agreed-upon data base.

15.3. STANDARD INDICES

A proposal was made to establish standard indices for recruitment abundance, CPUE, etc. for each major tuna species. In the past, various scientists used different indices from time to time and it was very difficult for other scientists to keep continuity in their analyses from year to year. If the standard indices are carefully chosen and established everyone can monitor and update them from year to year thus maintaining continuity. Any other indices can be discussed in relation to the standard indices.

The Committee fully endorsed this proposal and asked the Chief Rapporteurs of each species section to draft a detailed definition of standard indices which should be used for that species until such time that other indices are proven to be more feasible. Such a draft should be circulated to the assistant species rapporteurs as well as to interested scientists. The final draft should be made available at the time of the 1980 SCRS Officers Meeting.

Item 16. Review of SCRS research programs and consideration of future plans

Under this item, the Committee reviewed the pending questions, including holding inter-sessional meetings in 1980.

16.1. BLUEFIN MEETING TO EVALUATE STOCK CONDITIONS

The *ad hoc* group which was set up to study this matter reported its discussions. It became clear that the present data base for bluefin is not sufficient to warrant holding another inter-sessional meeting in 1980.

On the other hand, the Committee foresaw little chance of having additional new data on bluefin tuna and its fisheries. Besides, even if we receive substantial new data it will take considerable time to make preliminary analysis. The Committee decided not to hold an inter-sessional bluefin meeting in 1980. However, the Committee recognized that in 1981 we may have to hold such an inter-sessional meeting to evaluate bluefin stock conditions. In the meantime, the Committee hoped that the new SCRS organization to be adopted for the 1980 SCRS meeting would permit the bluefin scientists to have more sufficient time for their deliberations.

16.2. THE WORKING GROUP ON JUVENILE TROPICAL TUNAS

After evaluating the need for such a meeting proposed by the Working Group at its last session in Abidjan, the Committee endorsed the recommendation of the Working Group to hold a meeting in late May, 1980. The SCRS agreed that the meeting should take place where computer facilities are readily available and where the data base for tropical tunas is also available. At this meeting, CECAF representatives should be invited to participate. The Committee expressed its appreciation to CECAF for their

cooperation in jointly holding the Abidjan meeting, particularly for assuming expenses of CECAF scientists and for providing secretarial services during the meeting. The Committee hoped that CECAF member country scientists would be able to attend the 1980 meeting.

The observer from CECAF expressed his organization's interest in this meeting and stated that the CECAF Secretariat would try to make it possible for their member country scientists to attend the meeting.

16.3. SCRS OFFICERS MEETING

The SCRS noted that inter-sessional officers meetings are extremely effective for reviewing the progress made and for considering the procedure of the coming meeting. Therefore, the Committee recommended that an Officers Meeting be held in 1980, preferably in conjunction with one of the other inter-sessional meetings.

16.4. PRODUCTION MODEL

There was a comment made that the SCRS should consider seriously in the future the nature of the production model, particularly in relation to the right-hand side of the curve. The interpretation of that part of the curve in relation to the projected future of the fisheries in terms of various biological characteristics of the fish is a rather important point to be considered. Besides, the production model in relation to various parameters (e.g. values of m) should be carefully reviewed. This proposal was fully endorsed by the Committee as one of its important future tasks.

16.5. CATCH RATES IN RELATION TO ENVIRONMENTAL VARIATIONS

It was pointed out that the catch-per-unit-of-effort tended to be interpreted as a direct index of abundance or at least to be affected by only the surface environment. However, recent studies show that in both longline fisheries and surface fisheries, CPUE is directly affected by profiles of environmental variables. Therefore, studies of the physical environment, particularly the species habitat, should be emphasized in relation to the interpretation of CPUE. The Committee noted that the International Skipjack Year Program is already considering research of this type.

16.6. SEX RATIO STUDIES RELATED TO THE SIZE OF TUNAS

In carrying out population dynamics studies, the scientists noted the need for a study of various parameters, such as natural mortality, growth and catchability, by sex. This problem should be one of the major future research tasks of the Committee.

Item 17. Assignments and responsibilities of each scientist

The Committee decided that all the assignments and responsibilities of scientists have been clearly stated under each Agenda item and that it was not necessary to make a special table at this stage.

Item 18. Cooperation with other organizations

The Assistant Executive Secretary reported on the various relationships which ICCAT has maintained in the past with FAO and its affiliated bodies (CECAF, WECAF, IOFC, IPFC, etc.), the Inter-American Tropical Tuna Commission (IATTC), the South Pacific Commission (SPC), the International Council for the Exploration of the Sea (ICES), the International Commission for Southeast Atlantic Fisheries (ICSEAF), etc. The Committee thanked FAO for the assistance given by various attendants at ICCAT meetings and expressed hope that cooperation with these international agencies will continue. In particular, the close cooperation of the Bluefin Working Group of ICES with ICCAT will secure the collection of data from countries which are members of ICES but not members of ICCAT. It was pointed out that the Inter-governmental Oceanographic Commission is now increasing its interest in biological aspects. Since this organization has a large data base, ICCAT might be able to benefit by cooperating with this Commission. Also mentioned was that the SPC has considerable experience in organizing an international skipjack program and that close cooperation and exchange of data and information with SPC are recommended.

Item 19. Report of the Working Group on Publication Policy

Dr. O. Cendrero, the Convener of the Working Group on Publication Policy, reported the study of the Group which is attached as Appendix 7. Item 20 reflects the Committee's discussion on the appended report.

Item 20. Scientific publications

Two points of the Working Group on Publication Policy Report were subject to major discussion. The suggestion made by the Working Group that enough copies of SCRS papers be provided by the authors to make a Collective Volume was considered to be impractical since this would not save much on publication costs, while it would substantially increase the authors' burden. Moreover, the format of the Collective Volume would become too varied. The proposal of ICCAT's making a formal publication of selected papers was discussed. The Committee thought it premature to publish such a series. The creation of this series would increase ICCAT's publication costs. Besides, it seems that the Collective Volume (Red Book) perfectly meets the needs of the scientists involved in tuna studies.

On the other hand, the Committee agreed that all the papers accepted by the SCRS and referred to in its Report should be included in the Collective Volume, except those already published elsewhere or those in the process of publication in the immediate future.

A proposal was made to make this Collective Volume a formal publication of ICCAT. The Committee asked the Working Group on Publication Policy to study this proposal during the inter-sessional period and report the results at the 1980 meeting.

The format in which the reports should be submitted for the Collective Volume was discussed. Some minor modifications to the format were suggested for which the Secretariat agreed to be responsible.

The Executive Secretary expressed his great concern about the ever increasing mailing costs and proposed that the Secretariat send one copy to each laboratory by air mail and the other copies by surface mail. The Committee agreed with this proposal.

Item 21. Progress made by the Secretariat regarding assignments given to it

Since all the progress made by the Secretariat has been reported and reviewed under various Agenda items, there was no more discussion on this item.

Item 22. Identification of questions asked of the SCRS, recommendations and priorities

The Committee reviewed the Proceedings of the First Special Meeting of the Commission (1978) and found that only one question was asked of the SCRS by the Commission and that was regarding juvenile tropical tunas. This question was answered in part by the Working Group on Juvenile Tropical Tunas. However, more complete advice is still to be made after the Working Group meets again in 1980. In this respect, the Committee realized that there is some ambiguity in the question asked by the Commission.

The SCRS expressed some concern about the inadequate communication between the SCRS and the Commission in the past. The SCRS asked the Commission to present its questions to the Committee in a very explicit way so that the Committee can identify the questions and answer them in the most adequate way.

Item 24. Other matters

Dr. N. Bartoo (U.S.A.), the Convener of the Working Group on SCRS Organization, a Group which was established at the beginning of the SCRS session, reported the results of the deliberations of his Group. The report is attached herewith as Appendix 6.

There was consensus in the SCRS that the advice given by the Committee to the Commission should be concise, factual, not repetitive and should include more tables and figures rather than wordy descriptions. The Committee agreed with the philosophy presented by the Working Group and recommended that at the 1980 SCRS meeting, three days (Monday, Tuesday and Wednesday) be set aside for the meeting of the rappor-

teurs' groups with open participation. The SCRS Plenary Sessions will start on Thursday. For the 1980 meeting only, on a trial basis, the summaries of the rapporteurs' reports, consisting of not more than five pages of text (double-spaced) plus tables and figures should be discussed at the Plenary SCRS Sessions and consequently presented to the Commission meeting. Again in 1980 only, one or two pages of supplemental explanatory notes can be added to the five-page summary. This new procedure will be evaluated in 1980 by the Working Group at the end of the SCRS meeting for its effectiveness. The proposal of making species synopses was accepted by the Committee. However, the Committee recognized the difficulties in carrying this out in the future since all the scientists involved will have no time to work on the synopses. The SCRS asked the Secretariat to contact FAO and ask if that organization could provide some mechanism to be used to complete the species synopses.

Item 23. Date and place of next meeting

The Committee decided that the 1980 meeting would be held at the same place starting on the Monday of the preceding week of the 1980 Commission meeting.

Item 25. Election of SCRS Chairman and nomination of Sub-Committee Conveners

The Executive Secretary asked the Committee members for nominations for the SCRS Chairman. The Messrs. Fonteneau (France), Sakagawa (U.S.A.) and Beckett (Canada) were nominated. However, Drs. Sakagawa and Beckett asked that their names be withdrawn from the nominations, since their tasks would conflict with such a difficult job. Therefore, Mr. A. Fonteneau was re-elected SCRS Chairman for the next biennial period.

Mr. Fonteneau thanked the Committee for their excellent collaboration during his first term as SCRS Chairman and he promised that in the future he would do his best at the job, particularly in answering the questions presented by the Commission.

Mr. Fonteneau then nominated Mr. S. Kume (Japan) as Convener of the Sub-Committee on Statistics, Mr. G. Sakagawa (U.S.A.) as Convener of the Sub-Committee on Skipjack and Mr. Amon Kothias (Ivory Coast) as Convener and Mr. M. Mensah (Ghana) as Vice-Convener of the Working Group on Juvenile Tropical Tunas.

Item 26. Adoption of Report

The Report was adopted.

Item 27. Adjournment

The meeting was adjourned.

Table 1. Atlantic yellowfin catch (1,000 MT)

	1966	*1967*	*1968*	*1969*	*1970*	*1971*	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*[1]
TOTAL	61.8	58.5	83.7	92.8	74.2	72.5	92.0	93.0	107.6	122.7	126.2	128.4	135.2	124.2
East Atlantic	46.9	51.8	75.3	81.2	60.3	57.5	77.7	83.5	96.3	107.8	115.0	115.6	118.3	107.3
– Surface	35.5	38.0	54.7	61.7	44.6	43.9	59.4	59.1	76.5	92.9	99.9	100.0	107.0	96.3
Baitboat	20.7	17.1	23.5	16.3	9.4	10.4	12.8	14.3	19.8	9.4	13.0	11.0	9.4	11.5
Angola	1.3	.9	1.1	.4	.3	.5	.6	.6	.8	.1	1.0	1.9	2.0	2.5
FIS	15.9	14.9	19.9	14.3	7.5	7.6	7.5	5.5	6.3	2.9	3.7	3.4	2.8	3.0
Ghana[2]	0.	0.	0.	0.	0.	0.	.0	.1	.3	.7	.8	.6	.3	.6
Japan[2]	.5	1.3	2.2	1.0	.8	2.0	3.5	6.5	7.1	1.1	4.9	2.6	1.4	1.5
Korea-Panama[2]	0.	0.	0.	0.	0.	0.	.4	.8	2.8	3.5	2.0	2.1	1.7	2.8
Spain[3]	3.1	0.	.4	.6	.7	.4	.7	.8	2.0	1.0	.2	.3	.2	.2
Others	0.	0.	0.	0.	0.	0.	0.	0.	.5	.1	.3	.1	.9	.9
Purse seine	13.9	17.9	29.2	43.8	33.0	32.1	46.6	43.6	53.3	81.7	86.8	88.7	96.4	87.3
FISMP[4]	7.5	8.9	12.6	15.2	17.2	19.2	24.6	26.7	32.9	45.1	50.5	47.9	51.4	42.0
Japan[2]	4.8	5.2	7.5	4.7	1.1	2.0	2.5	1.2	.8	.1	0.	0.	0.	0.
Spain[3]	1.0	2.0	2.6	4.2	5.5	6.7	7.4	11.8	13.7	22.1	33.7	34.2	36.3	34.0
U.S.A.	0.	1.1	5.9	18.8	9.0	3.8	12.0	3.0	5.6	14.0	1.7	6.4	8.1	4.3
Others	.6	.7	.7	.9	.2	.4	.2	.8	.4	.4	.8	.2	.6	4.5
Other gears	.8	3.0	1.9	1.6	2.1	1.4	.0	1.2	3.3	1.9	.0	.4	1.2	.0
– Longline	11.4	13.8	20.6	19.5	15.7	13.6	18.3	24.4	19.8	14.9	15.1	15.5	11.3	11.0
China (Taiwan)	.8	1.9	6.6	7.0	3.9	3.4	3.5	1.5	1.0	1.3	.6	.2	.2	0.1
Cuba	0.	0.	0.	0.	0.	1.7	3.6	4.5	3.4	1.7	1.8	2.9	1.9	
Japan	10.6	10.1	9.8	6.4	2.5	1.6	2.3	1.3	.7	1.7	.3	.1	.3	0.7
Korea-Panama	0.	0.	1.6	4.2	9.3	6.9	7.8	17.1	14.7	10.2	10.9	10.6	8.4	5.8
Others	0.	1.7	2.7	1.9	0.	0.	1.1	.0	0.	0.	1.6	1.8	.5	4.4

West Atlantic	15.0	6.7	8.4	11.6	14.0	15.0	14.2	9.4	11.3	14.9	11.2	12.8	16.9	16.9
– Surface.	0.	0.	0.	0.	0.	0.	2.9	2.3	1.6	2.0	.6	.8	1.9	2.9
– Longline.	12.1	3.5	6.2	9.3	11.5	13.5	11.2	7.2	9.7	12.8	10.1	11.6	14.2	14.0
China (Taiwan). .	.3	.8	1.3	3.8	3.2	1.0	1.2	1.2	1.3	1.1	1.1	.1	.2	
Cuba	0.	0.	0.	0.	0.	0.	0.	0.	0.	.6	1.2	.9	.7	
Japan	11.8	2.7	4.2	3.6	4.3	9.1	4.2	2.5	2.8	2.4	3.1	1.4	1.7	
Korea-Panama . .	0.	0.	.7	1.8	4.0	3.0	3.3	1.3	4.0	7.6	3.5	7.2	5.0	
Others	0.	0.	.1	.1	0.	.4	2.6	2.2	1.5	1.1	1.3	1.9	6.8	
– Uncl. gears	2.9	3.2	2.2	2.3	2.4	1.5	0.	0.	0.	.1	.5	.4	.7	
Uncl. regions	0.	0.	0.	0.	0.	0.	.1	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.	.1	0.	0.	0.	0.	0.	0.	
– Uncl. gears	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	

1. Catch for 1979 is provisional.
2. Adjusted by the percent of bigeye in the yellowfin and bigeye catch from the Tema-based fleet sampled in Puerto Rico; 1969-1974- 21 °/ o BE; 1975 - 11 °/o BE; 1976 - 15 °/o BE; 1977-78 - 28 °/o BE (SCRS/79/26).
3. Spanish eastern tropical fleet catch adjusted by the percentage of bigeye in the yellowfin and bigeye catch of the FIS purse seine and baitboat fleets, 1969-78 (SCRS/79/26).
4. France-Ivory Coast-Senegal-Morocco-Portugal.

Table 2. Estimated carrying capacity (thousands of metric tons) and fishing effort for yellowfin tuna of the eastern Atlantic Ocean

	1968[1]	*1969*[2]	*1970*[2]	*1971*[2]	*1972*[2]	*1973*[2]	*1974*[2]	*1975*[2]	*1976*	*1977*	*1978*	*1979*[6]
Carrying capacity												
BB – Ivory Coast-Senegal	3.9	3.6	3.4	2.8	2.7	2.1	2.0	1.8	1.3	1.2	1.3	1.3
BB – Tema-based[4]	1.2	0.9	0.9	1.2	2.6	4.0	5.4	3.6	5.4	5.4	5.4	3.6
Total BB	5.1	4.5	4.3	4.0	5.3	6.1	7.4	5.4	6.7	6.6	6.7	4.9
Others[5]											1.9	1.9
PS – FIS	1.6	4.8	5.8	7.2	9.2	12.4	14.5	17.2	17.5	17.0	18.9	19.5
PS – Spain	1.1	1.2	2.7	3.6	5.6	7.5	9.1	14.0	17.2	20.4	24.3	25.2
PS – U.S.A.[3]	0.6	4.4	5.4	3.8	7.9	2.9	5.5	10.4	1.7	4.2	10.5	3.2
Total PS	3.3	10.4	13.9	14.6	22.7	22.8	29.1	41.6	36.4	41.6	55.6	49.8
Total BB – PS	8.4	14.9	18.2	18.6	28.0	28.9	36.5	47.0	43.1	48.2	62.3	54.7

1. Estimates from ICCAT Biennial Report, 1974-75, Part II (1975).
2. Estimates for 1969-1975 from Peter Miyake (SCRS/77/13) (except FIS).
3. U.S.A. estimate weighted by the number of months on the spot.
4. Includes Japan, Korea, Panama and Ghana.
5. Portugal-Congo.
6. Provisional estimates.

Table 3. Atlantic skipjack catch (1,000 MT)

	1966	*1967*	*1968*	*1969*	*1970*	*1971*	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*[1]
TOTAL	36.4	22.4	48.4	28.5	51.9	80.2	79.3	86.7	115.9	60.2	77.5	118.9	106.0	86.9
– Surface – East Atlantic	34.6	19.7	45.9	26.7	49.3	77.5	77.9	83.5	111.9	56.1	73.8	115.7	101.9	83.4
Purse seine	5.3	7.1	22.7	14.7	33.5	55.1	57.5	62.0	76.0	36.4	36.4	66.0	61.5	43.2
FISM[2]	1.9	1.6	5.1	2.8	8.8	14.2	14.8	8.4	24.0	11.5	16.3	30.9	24.1	20.0
Japan	1.4	2.2	6.3	.7	3.5	6.2	3.4	1.5	.9	.1	0.	0.	0.	0.
Spain	1.9	2.3	7.1	6.2	8.9	17.3	27.1	29.4	31.1	16.9	17.8	29.1	28.4	17.1
USA	.0	.5	3.3	4.8	11.8	16.2	12.2	21.2	20.0	7.4	1.8	5.9	6.8	2.7
Others	0.	.6	.9	.1	.6	1.2	.1	1.3	.1	.5	.5	.2	2.2	3.4
Baitboat	29.3	12.6	23.2	12.0	15.8	22.3	20.2	21.5	35.8	15.2	27.5	40.3	38.5	38.1
Angola	2.8	2.0	4.2	1.8	.9	1.9	1.5	1.3	3.4	.6	1.5	3.8	3.2	0.
FIS	4.5	3.9	7.9	3.7	4.4	5.8	3.8	3.3	4.5	1.8	2.2	2.7	3.3	0.
Ghana	0.	0.	0.	0.	0.	0.	0.	.1	.7	1.3	2.1	3.5	2.6	0.
Japan	4.4	3.7	7.3	4.9	7.5	11.7	10.1	13.0	18.7	3.7	15.0	16.8	14.6	0.
Korea-Panama	0.	0.	0.	0.	0.	0.	.7	1.1	3.1	6.3	4.4	7.6	11.1	0.
Spain	16.2	2.0	3.0	1.4	1.8	2.7	4.1	2.6	5.4	.8	.6	.7	.6	1.5
Others	1.5	.9	.8	.1	1.1	.1	.0	.1	.1	.7	1.6	5.2	3.1	2.5
Other gears	0.	0.	.0	.1	0.	.1	.1	.0	.1	4.5	9.9	9.5	1.9	1.6
– Surface – West Atlantic	0.	0.	0.	0.	0.	1.6	1.1	2.5	3.1	3.2	3.5	2.7	3.5	3.5
– Surface – Uncl. Region	0.	0.	0.	0.	0.	.2	0.	0.	0.	0.	0.	0.	0.	0.
– Uncl. gears	1.8	2.7	2.5	1.7	2.6	.8	.3	.7	.9	.8	.2	.4	.6	.5

1. Figures for 1979 are provisional.
2. 1969-73 catches raised by coverage in SCRS/74/46 and SCRS/79/66.

Table 4. Bluefin tuna catches (MT) by country, gear, and area, 1971-1979.

Fishery		*1971*	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*[4]
WESTERN ATLANTIC										
Subtotal		6058	2726	3595	3686	5100	6019	6687	5797	4780
Canada	Large	206	228	367	664	350	514	674	429	240
	Small (PS)	935	260	635	103	291	332	298	241	0
USA	Large	518	516	199	731	715	833	842	795	946
	Small (PS)	2651	1622	970	804	1986	1069	1058	989	1021
	Sport (small)			88	322	122	29	56	68	73
Grenada	Uncl	100	100	100	51	56	--	71	77	
Mexico	Uncl	--	--	--	--	24	37	14	28	
Dom. Rep.	Uncl	--	--	100	106	43	30	16	26	
Argentina	LL	--	--	2	--	--	--	--	--	
Brazil	LL	116	--	--	--	--	--	--	--	
Japan	LL[2]	1532	--	1097	905	1513	2902	3658	3144	2500
ATLANTIC-WIDE										
Subtotal		119	114	243	192	53	66	167	79	26
Taiwan	LL	119	84	172	136	32	56	3	30	26
Korea	LL	3039[1]	30	66	56	23	10	3		
Panama	LL	--	--	5	--	--	--	161	49	

EAST ATLANTIC										
Subtotal		4442	5806	4657	5831	9974	5558	6984	8363	3520
France	Surf	680	740	551	522	692	267	592	723	250
Morocco	PS	30	531	512	590	2624	331	662	36	
	Trap	63	122	1	7	0	0	222	0	
Norway	PS	568	430	420	864	988	529	764	233	
	LL	85								
Portugal	BB	--	--	21	1	318	218	151	438	
	Hand	1	--	--	--	3	410	82	2775	
Denmark	Uncl	1	--	2	1	--	3	1	3	
Sweden	Uncl	3	--	--	--	2	8	2	2	
Cuba	LL	--	--	--	--	--	--	--	--	
Ger.F.R.	Uncl	--	--	--	--	--	84	--	1	
Poland	Uncl	100	100	--	3	--	3	--	--	
Spain	BB - Can.	800	930	906	546	978	832	1250	1548	1000
	BB - NE	1511	2141	1696	1089	1018	680	1025	1577	970
	Trap	600	250	504	13	448	490	339	450	700
	Mixed	--	--	--	--	3	3	300	--	
Japan	LL[2]	--	562	44	2195	2900	1973	1594	577	600
MEDITERRANEAN										
Subtotal		4940	5428	5614	12690	11135	16032	11841	7737[3]	6060
France	PS	2200	1100	1400	1800	1600	3800	3182	1566	700
	Uncl								31	
Italy	Trap	746	667	317	1000	713	650	698	210	200
	PS	--	2300	2200	6000	6270	9010	5384	4538	4900
	Hand	500	500	500	500	500	512	534	110	100

Table 4 - continued

Fishery		*1971*	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*[4]
Japan	LL	--	112	246	2195	1260	968	520	61	150
Libya	Uncl	600	300	400	500	290	290	286	--	
Malta	Uncl	--	--	--	21	37	25	47	26	
Morocco	Trap	37	36	1	7	--	--	--	--	
	PS	42	1	--	2	40	1	7	--	
Spain	Uncl	129	124	274	192	103	100	--	--	
	LL	--	--	--	--	--	--	68	85	10
Tunisia	Trap	238	64	52	123	101	65	120	--	
Yugoslavia	PS	326	200	224	317	155	562	932	1043	
Algeria	Uncl	100	1	--	33	66	49	40	20	
Turkey		22	23	--	--	--	--	23	47	
TOTAL OF ABOVE		15559	14074	23609	22399	26262	27675	25679	21976	14386

1. Includes all big tunas, therefore not included in totals.
2. Catches split by Z. Suzuki 1972-77.
3. Estimated catches of Tunisia and Libya bring total to 8174 MT.
4. Provisional.

Table 5. Estimated numbers and percent of under-sized fish (<6.4 kg.) caught in various fisheries

	West Atlantic[1]		*Bay of Biscay*[2]		*Morocco PS*[3]		*French PS Med.*[4]		*East Atlantic*[1]	
Year	*Total no. caught*	*o/o < 6.4 kg.*	*Total no. caught*	*o/o < 6.4 kg.*	*Total no. caught*	*o/o < 6.4 kg.*	*Total no. caught*	*o/o < 6.4 kg.*	*Total*	*o/o age <6.4 kg.*
73	168130	4.8	89827	2.2	120000	100	43960	0.0	843860	59.6
74	66810	21.9	92107	1.7	137000	100	99741	0.0	833865	51.6
75	242050	20.9	160878	9.5	222000	100	116752	≤ 11.6	1579920	67.3
76	111110	2.9	67845	1.2	74000	100	182948	0.2	729400	35.3
77	87340	1.3	112561	7.1	132000	100	159932	3.0	1013170	48.2
78	67530	6.6	216009	55.6	6600	100	94529	0.0	698490	36.6
Weighted means										
73-75		12.4		5.5		100		5.2		61.3
76-78		3.3		32.5		100		1.2		41.0

1. SCRS/79/98 (Estimates input to cohort analysis; data are best available, but recognized to be incomplete).
2. SCRS/79/60.
3. SCRS/79/59.
4. SCRS/77/69, SCRS/76/84 by H. Farrugio.

South Atlantic	26.7	19.8	27.8	34.6	29.8	31.5	41.6	22.2	19.6	21.2	20.0	23.3	22.7	
– Surface	0.	0.	0.	0.	0.	0.	.1	.1	.1	.2	.0	.1	.1	0.
– Longline	26.7	19.8	27.8	34.6	29.8	31.5	41.5	22.1	19.5	21.1	20.0	23.2	22.6	
China (Taiwan). . .	.1	1.7	7.6	13.4	14.7	17.7	25.3	21.7	18.0	16.1	15.4	18.1[2]	20.5[2]	21.6[2]
Japan	21.0	7.7	11.9	6.3	5.9	3.2	2.1	.3	.1	.3	.1	.2	.1	0.
Korea-Panama . . .	4.7	9.7	7.2	14.4	8.7	10.0	13.9	.0	1.2	4.5	4.2	4.7	1.7	0.
Others	.8	.7	1.2	.4	.5	.5	.2	.1	.2	.2	.3	.2	.2	0.
Mediterranean.	.5	.5	.5	.7	.6	.5	.7	.5	.5	.5	.6	.6	.6	0.
Uncl. Region	0.	0.	.0	0.	0.	0.	.9	.0	0.	.1	.2	.6	.9	0.
– Surface	0.	0.	.0	0.	0.	0.	0.	.0	0.	.0	0.	.1	.1	0.
– Longline	0.	0.	0.	0.	0.	0.	.9	0.	0.	.1	.2	.5	.8	0.
Uncl. gears	.1	.1	.7	.9	.6	.9	.1	.1	.1	.1	.1	0.	.1	0.

1. Preliminary estimates (R.T. Yang).
2. Estimates from various sources are as follows:

Taiwan North-South breakdown (in 1000 MT)

	1978		1977	
	North	South	North	South
Taiwan (official)	5.0	24.8	4.9	24.9
ICCAT	12.2	17.6	14.0	15.8
SCRS estimate	9.3	20.5	11.7	18.1

Table 6. Atlantic albacore catch (1,000 MT)

	1966	*1967*	*1968*	*1969*	*1970*	*1971*	*1972*	*1973*	*1974*	*1975*[1]	*1976*	*1977*	*1978*	*1979*
TOTAL	75.0	74.9	72.1	76.2	70.7	83.5	83.7	73.7	72.1	61.8	77.0	74.6	72.0	
North Atlantic	47.8	54.5	43.0	40.0	39.7	50.6	40.4	50.8	51.9	39.9	56.1	50.2	47.7	
– Surface	39.8	49.0	38.5	32.2	30.3	40.0	34.9	26.7	37.2	31.0	34.0	32.1	34.0	0.
Baitboat	16.4	17.6	13.7	13.8	14.5	15.5	8.4	8.7	15.6	21.1	20.3	15.6	11.7	0.
France	3.7	4.2	2.4	1.8	2.0	1.6	1.1	1.0	.5	.7	1.1	.6	.4	0.
Spain	12.7	13.4	11.3	12.0	12.5	13.9	7.3	7.7	13.8	19.4	18.8	14.9	11.3	0.
Others	0.	0.	0.	0.	0.	0.	0.	0.	1.2	1.0	.4	.1	.1	0.
Trolling	23.4	31.4	24.9	18.4	15.9	24.5	26.5	18.0	21.6	9.9	13.7	16.5	22.1	0.
France	10.6	12.4	11.9	8.2	4.6	8.2	8.7	5.1	8.5	5.4	5.6	6.2	8.0	0.
Spain	12.8	19.0	13.0	10.2	11.3	16.3	17.8	12.9	13.1	4.5	8.1	10.3	14.1	0.
Others	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Other gears	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	.1	.0	.1	0.
– Longline	8.0	5.5	4.5	7.8	9.4	10.6	5.5	24.1	14.7	8.9	22.0	18.1	13.7	0.
China (Taiwan)	.1	.1	1.1	1.5	2.2	2.7	4.1	10.0	8.2	5.4	14.0	11.7[2]	9.3[2]	6.2[1]
Japan	5.9	4.8	3.3	4.7	5.9	6.5	1.3	1.5	2.1	1.3	1.3	.8	.5	0.
Korea-Panama	2.0	.6	.1	1.6	1.3	1.5	.1	12.7	4.4	2.0	6.6	5.6	3.8	0.
Others	0.	0.	0.	0.	0.	0.	0.	0.	0.	.1	.1	0.	.1	0.

Table 7. Atlantic bigeye catch (1000 MT)

	1966	*1967*	*1968*	*1969*	*1970*	*1971*	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*
Total	19.0	14.4	19.8	26.7	30.7	49.2	38.9	48.7	58.0	55.2	38.4	46.9	45.7
North Atlantic	9.2	4.3	6.5	8.4	16.1	26.1	18.1	24.5	38.4	37.1	21.5	27.9	25.2
– Surface	0.	0.	0.	1.6	1.0	7.5	3.3	5.4	12.9	12.5	7.9	12.1	11.7
Baitboat	0.	0.	0.	1.4	.7	7.3	3.2	4.9	12.0	11.6	7.0	8.6	10.3
FIS	0.	0.	0.	1.4	.7	.3	.1	.5	.5	1.2	1.2	2.5	3.6
Portugal	0.	0.	0.	0.	0.	0.	0.	0.	8.4	4.7	1.6	2.6	2.9
Spain	0.	0.	0.	0.	0.	7.0	3.1	4.4	3.2	5.7	4.2	3.6	3.9
Others	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	0.	0.	0.
Purse seine	0.	0.	0.	.2	.3	.2	.1	.5	.1	.7	.4	2.1	1.3
FISMP	0.	0.	0.	.0	.2	.1	.1	.1	.1	.3	.1	.9	.4
Spain[1]	0.	0.	0.	.1	.1	.1	.0	.4	.0	.3	.2	1.2	.9
Others	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	0.	0.
Other gears	0.	0.	0.	0.	0.	0.	0.	0.	.7	.2	.5	1.4	0.
– Longline[2]	8.9	4.0	5.6	5.8	11.0	18.6	14.8	19.1	25.6	23.1	12.1	15.8	13.6
China (Taiwan)	.1	.3	1.5	3.0	5.1	2.4	.8	1.3	1.1	1.5	.4	.3	.6
Cuba	0.	0.	0.	0.	0.	1.2	.8	1.0	.9	.7	.8	1.4	.5
Japan	8.8	3.4	4.0	2.4	4.7	13.1	11.8	11.1	17.6	12.4	5.9	5.3	5.8
Korea-Panama	.1	.2	.1	.5	1.2	1.8	1.4	5.7	5.9	8.5	5.0	6.6	6.3
U.S.S.R.	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	2.2	.5
– Uncl. gears	.3	.3	.9	1.0	4.1	0.	0.	0.	0.	1.5	1.5	0.	0.
South Atlantic	9.7	10.1	13.3	18.3	14.6	23.0	20.8	24.1	19.6	18.1	17.0	19.0	20.5

– Surface	.0	.5	1.1	2.2	1.7	2.6	3.1	5.3	6.1	1.9	3.1	5.5	5.3
Baitboat	.0	.4	.6	.5	.5	.8	1.5	2.4	2.8	.7	1.4	2.1	1.4
FIS	0.	0.	0.	.3	.2	.3	.4	.4	.1	0.	0.	0.	0.
Ghana	0.	0.	0.	0.	0.	0.	0.	.0	.1	.1	.1	.2	.1
Japan	.0	.4	.6	.3	.2	.5	.9	1.7	1.9	.1	.9	1.0	.6
Korea-Panama	0.	0.	0.	0.	0.	0.	.1	.2	.7	.4	.4	.8	.7
Others	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Purse seine	0.	.1	.4	1.6	1.2	1.8	1.6	2.9	3.2	1.3	1.7	3.4	3.9
FISMP	0.	0.	0.	.1	.5	.5	.5	1.8	1.5	.6	.6	1.3	1.1
Japan	0.	.1	.4	1.3	.3	.5	.7	.3	.2	.0	0.	0.	0.
Spain[1]	0.	0.	0.	.1	.2	.2	.2	.6	.7	.6	1.0	1.8	2.5
U.S.A.	0.	0.	.0	.1	.2	.5	.2	.1	.9	.1	.0	.3	.2
Others	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	0.	.1
Other gears	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.1
– Longline[2]	9.7	9.6	12.2	16.2	13.0	20.4	17.7	18.8	13.5	16.2	13.8	13.5	14.5
China (Taiwan)	.5	1.9	3.8	4.5	2.4	3.1	4.2	2.5	2.0	2.5	2.9	2.7	2.0
Cuba	0.	0.	0.	0.	0.	2.0	1.2	1.6	1.5	1.2	.5	.5	1.8
Japan	8.8	5.2	6.2	7.9	4.3	7.1	6.3	8.8	3.2	5.0	1.4	3.9	3.6
Korea-Panama	.2	.1	.2	1.4	3.5	5.5	4.3	2.8	3.3	3.6	3.7	2.2	4.9
Others	.2	2.5	2.0	2.4	2.7	2.7	1.6	3.1	3.6	3.9	5.2	4.3	2.2
– Uncl. gears	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.1	0.	.7
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.

1. North-South breakdown of Spanish tropical catch is based on North-South breakdown of FIS purse seine catches.
2. North-South breakdown of longline was made using Table 1 of SCRS/79/62.

Table 8. CPUE of bigeye tuna based on nominal fishing effort for the Canarian baitboat fishery during the peak fishing season (March-May), 1975-78.

Year	*Catch (MT)*	*Days at sea*	*CPUE (MT/day)*
1975	4,452	10,605	0.42
1976	2,898	7,619	0.38
1977	2,430	10,032	0.24
1978	3,220	10,779	0.30

Table 9. Equilibrium Y/R resulting from increasing age-at-first-capture to optimum levels for various levels of fishing mortality in the Atlantic bigeye tuna fishery (see Fig. 33).

	Optimum		*Equilibrium*	*% change in Y/R (relative to Y/R at t_c = 1*
F	t_c	W_c	*Y/R*	
	Yrs.	Kgs.	Kgs.	
.2	2.4	11.5	6.0	+ 9
.4	2.6	13.5	7.6	27
.6	3.0	18.2	8.3	38
.8	3.2	20.9	8.6	56
1.0	3.3	22.4	8.7	74
1.2	3.4	23.9	9.0	80
1.4	3.5	25.4	9.2	84

F = instantaneous fishing mortality rate.
t_c = age-at-first-capture.
W_c = weight at optimum t_c.
Y/R = yield-per-recruit.

Weight at optimum t_c calculated from length-age relation (SCRS/79/77) and weight-length relation (ICCAT Statistical Series-3.

Table 10. Landings (MT), fishing intensity (thousands of hooks per 5° area), and index of abundance (U_f) for blue marlin in the Atlantic Ocean, 1956-77.

Year	*Brazil*	*Taiwan*	*Cuba*	*Japan*	*Korea*	*USA*	*USSR*	*Venezuela*	*Panama*	*Argentina*	*Total*	f^a	f^b	U_f
1956				6							6	2	2	3.00
1957				92							92	42	42	2.19
1958				722							722	81	81	8.91
1959				847							847	171	171	4.95
1960				1517		109					1626	225	141	6.74
1961			236	3768		123					4127	232	254	16.24
1962			314	7100		122					7536	652	692	10.89
1963		69	365	8600		136					9170	843	899	10.20
1964			247	7600		171					8018	1216	1283	6.25
1965			268	5751		173					6192	932	1003	6.17
1966		112	205	3370	26	158					3871	548	629	6.15
1967		381	754	1073	108	209					2525	261	614	4.11
1968	38	690	1100	946	685	178		113			3750	207	821	4.57
1969	51	1434	500	960	569	220		213			3947	280	1151	3.43
1970	52	1402	262	1005	2008	216		210			5155	261	1339	3.85
1971		1336	246	1393	1050	189		286			4500	525	1696	2.65
1972	31	1036	126	420	1138	202	38	254			3245	210	1623	2.00
1973	8	760	416	346	1034	221	42		272	25	3124	139	1255	2.49
1974	13	394	802	284	1168	247	42	32			2982	111	1166	2.56
1975	12	357	723	608	1223	255	13	31			3222	290	1537	2.10
1976		335	195	264	280	281				2	1357	166	853	1.59
1977		765	316	135	503	295					2014	87	1298	1.55

f^a = effective fishing intensity for the Japanese fleet.
f^b = effective fishing intensity for the entire fishery.

Table 11. Landings (MT), fishing intensity (thousands of hooks per 5^{o} area), and index of abundance (U_f) for blue marlin in the North Atlantic Ocean, 1956-77.

Year	*Taiwan*	*Cuba*	*Japan*	*Korea*	*USA*	*USSR*	*Venezuela*	*Panama*	*Total*	f^a	f^b	U_f
1956			5						5	2	2	2.50
1957			90						90	51	51	1.76
1958			270						270	98	98	2.76
1959			500						500	158	158	3.16
1960			460		109				569	157	194	2.93
1961		236	330		123				689	123	257	2.68
1962		314	4060		122				4496	367	406	11.06
1963		365	4050		136				4551	579	651	6.99
1964		247	3930		171				4348	961	1063	4.09
1965		268	2100		173				2541	778	941	2.70
1966		205	890	26	158				1279	355	510	2.51
1967	70	577	390	108	209				1354	209	726	1.87
1968	430	847	370	685	178		113		2623	156	1106	2.37
1969	280	500	770	569	220		213		2552	271	898	2.84
1970	300	262	700	2008	216		210		3696	249	1315	2.81
1971	230	246	1270	1050	189		286		3271	589	1517	2.16
1972	110	126	340	1138	202	38	254		2208	213	1383	1.60
1973	160	416	260	1034	221	42		272	2405	128	1184	2.03
1974	230	802	270	1168	247	42	32		2791	125	1292	2.16
1975	90	723	605	1150	255	13	31		2867	308	1460	1.96
1976	93	160	261	213	281				1008	186	718	1.40
1977	280	248	119	358	295				1300	98	1071	1.21

f^a = effective fishing intensity for the Japanese fleet.
f^b = effective fishing intensity for the entire fishery.

Table 12. Landings (MT), fishing intensity (thousands of hooks per 5° area), and index of abundance (U_f) for white marlin in the Atlantic Ocean, 1957-77.

Year	*Brazil*	*Taiwan*	*Cuba*	*Japan*	*Korea*	*USA*	*USSR*	*Venez.*	*Panama*	*Argen.*	*Total*	f^a	f^b	U_f
1957				15							15	19	19	.79
1958				25							25	61	61	.41
1959				123							123	160	160	.77
1960				206		65					271	184	242	1.12
1961			42	671		64					777	165	191	4.07
1962			84	1900		79					2063	546	593	3.48
1963		24	102	2400		68					2594	635	686	3.78
1964		20	114	3500		75					3709	1403	1487	2.49
1965			216	4631		81					4928	949	1010	4.88
1966		100	183	3002	11	81					3377	622	700	4.83
1967		237	469	668	47	87					1508	287	648	2.33
1968	44	794	106	1088	295	93		131			2551	379	889	2.87
1969	45	1260	65	843	245	81		80			2619	223	693	3.78
1970	37	981	183	703	866	111		146			3027	374	1610	1.88
1971	18	1102	176	979	482	101		222			3080	431	1356	2.27
1972	99	974	120	439	522	106	42	239			2541	240	1389	1.83
1973	11	768	503	355	475	111	42		271	25	2561	168	1212	2.11
1974	36	550	1290	390	536	116	59	46			3023	174	1349	2.24
1975	31	338	506	418	632	114	9	22			2070	293	1451	1.43
1976	51	689	403	543	576	116					2378	266	1165	2.04
1977	10	459	189	106	302	109				2	1177	206	2287	.51

f^a = effective fishing intensity for the Japanese fleet.
f^b = effective fishing intensity for the entire fishery.

Table 13. Landings (MT), fishing intensity (thousands of hooks per 5^{o} area), and index of abundance (U_f) for white marlin in the North Atlantic Ocean, 1957-77.

Year	*Taiwan*	*Cuba*	*Japan*	*Korea*	*USA*	*USSR*	*Venez.*	*Panama*	*Total*	f^a	f^b	U_f
1957			5						5	31	31	.16
1958			15						15	94	94	.16
1959			30						30	171	171	.18
1960			40		65				105	108	284	.37
1961		42	60		64				166	53	147	1.13
1962		84	580		79				743	276	354	2.10
1963		102	930		68				1100	561	664	1.66
1964		114	2160		75				2349	1018	1107	2.12
1965		216	1630		81				1927	769	909	2.12
1966		183	1430	11	81				1705	494	589	2.89
1967	5	359	370	47	87				868	213	500	1.74
1968	100	82	360	295	93		131		1061	177	522	2.03
1969	170	65	470	245	81		80		1111	189	447	2.49
1970	120	183	560	866	111		146		1986	317	1124	1.77
1971	240	176	930	482	101		222		2151	605	1399	1.54
1972	130	120	356	522	106	42	239		1515	280	1192	1.27
1973	220	503	337	475	111	42		271	1959	227	1320	1.48
1974	390	1290	386	536	116	59	46		2823	265	1938	1.46
1975	200	506	405	550	114	9	22		1806	408	1819	.99
1976	92	331	541	196	116				1276	396	934	1.37
1977	39	147	88	215	109				598	312	2120	.28

f^a = effective fishing intensity for the Japanese fleet.
f^b = effective fishing intensity for the entire fishery.

Table 14. Landings (MT), fishing intensity (thousands of hooks per 5° area), and index of abundance (U_f) for sailfish and spearfish in the Atlantic Ocean, 1956-77.

Year	*Argen.*	*Brazil*	*Cuba*	*Ghana*	*Japan*	*Korea*	*Panama*	*Taiwan*	*USA*	*USSR*	*Venez.*	*Total*	f^a	f^b	U_f
1956					1							1	2	2	.50
1957					39							39	49	49	.80
1958					50							50	131	131	.38
1959					72							72	253	253	.28
1960					160				111			271	360	610	.44
1961			22		361				126			509	411	579	.88
1962			2		600				142			744	863	1070	.70
1963			34		800			7	157			998	696	868	1.15
1964			40		1200				173			1413	1242	1462	.97
1965			116		2471				188			2775	1041	1169	2.37
1966			112		1845	13		62	194			2226	602	726	3.06
1967			447		678	55		241	201			1622	327	782	2.07
1968		38	100		970	350		707	207		116	2488	318	816	3.05
1969		24	50		458	290		685	214		79	1800	222	872	2.06
1970		31	155		594	1025		829	220		124	2978	244	1223	2.43
1971		77	78		446	502		499	227		108	1937	258	1121	1.73
1972		92	60		222	545		492	233	20	120	1784	176	1414	1.26
1973	10	37	193	2	144	495	107	294	240	16		1538	83	886	1.73
1974		82	366	8	138	559		241	248	19		1661	77	927	1.79
1975		88	171	22	152	592		87	254	3	7	1376	168	1521	.90
1976		167	102	11	137	159		174	261			1011	99	731	1.38
1977		80	95		47	151		230	267			870			

f^a = effective fishing intensity for the Japanese fleet.
f^b = effective fishing intensity for the entire fishery.

Table 15. Atlantic swordfish catch (1,000 MT)

	1966	*1967*	*1968*	*1969*	*1970*	*1971*	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*
TOTAL	12.8	13.0	13.1	15.3	15.7	10.2	12.2	11.6	10.8	11.4	11.8	12.8	18.9
Algeria	0.	0.	0.	0.	0.	0.	.0	.1	.2	.5	.4	.4	.3
Argentina	.2	.1	.3	.5	.4	.1	.1	.0	.0	.0	.1	.1	.0
Brazil	.2	.1	.1	.2	.1	0.	.1	.1	.3	.3	.3	.3	.4
Bulgaria	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	0.
Canada	4.4	4.8	4.4	4.3	4.8	0.	0.	0.	0.	.0	.0	.1	2.3
China (Taiwan)	0.	0.	0.	0.	0.	0.	.8	1.1	.8	.9	.9	.9	0.
Cuba	.1	.2	0.	0.	0.	0.	0.	0.	0.	0.	.6	.7	.6
Cyprus	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	.1	.1	.1
Ghana	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.8	1.9
Italy	0.	1.9	1.4	2.0	1.8	2.9	3.7	2.7	1.5	1.5	2.1	1.9	3.0
Japan	2.0	.8	1.1	2.3	3.2	1.6	1.8	1.0	1.4	1.5	.8	.8	.9
Korea	0.	0.	0.	0.	0.	0.	0.	0.	0.	.5	1.1	1.2	1.3
Libya	.2	.3	.5	0.	0.	.1	0.	0.	0.	0.	0.	0.	0.
Malta	0.	0.	0.	0.	.1	.2	.2	.2	.2	.2	.2	.2	.1
Mexico	0.	0.	0.	0.	0.	0.	.0	.0	.0	0.	0.	0.	.0
Morocco	.3	.2	.2	.3	.2	.4	.3	.2	.2	.1	.2	.2	.2
Norway	.3	.3	.2	.6	.4	.2	0.	0.	0.	0.	0.	0.	0.
Panama	0.	0.	0.	0.	0.	0.	.2	.4	0.	0.	.0	.1	.2
Poland	0.	0.	0.	0.	0.	0.	0.	.1	0.	0.	0.	0.	.0
Rumania	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0
Spain	4.0	3.4	4.6	4.6	4.1	4.5	4.5	4.9	3.6	3.8	2.9	4.0	4.3
Tunisia	0.	0.	0.	0.	0.	0.	0.	0.	.0	0.	0.	0.	0.
Turkey	.3	.1	0.	.1	.1	.1	.1	0.	.0	0.	0.	0.	0.
USA	.6	.5	.3	.2	.3	.0	.2	.4	1.1	1.7	1.4	.9	3.0
USSR	0.	0.	0.	.1	.2	.2	.2	.2	1.4	.3	.6	.1	.2
Venezuela	.2	.4	0.	.1	0.	0.	0.	0.	0.	.1	.0	.0	.1
Gear													
Longline	9.9	10.5	11.0	13.2	13.7	8.2	9.9	9.3	6.9	8.6	8.4	8.9	11.2
Surface uncl.	2.9	2.4	2.1	2.1	2.0	2.0	2.3	2.3	3.8	2.8	3.4	3.9	7.5

Table 16. Atlantic small tuna catch (1,000 MT)

	1966	*1967*	*1968*	*1969*	*1970*	*1971*	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*
Blackfin tuna *(T. atlanticus)*	.1	.1	.2	.2	.2	.2	.4	.5	.3	.3	.2	.4	.1
Atlantic little tuna *(E. alletteratus)*	8.1	8.9	8.1	9.0	13.6	10.9	8.0	7.4	7.3	1.2	1.3	2.7	13.6
Atlantic bonito *(S. sarda)*	29.2	49.1	31.8	61.5	28.6	21.5	16.3	12.4	17.7	13.0	9.5	11.4	6.6
Frigate tuna *(A. thazard)*	7.2	9.3	9.5	11.0	12.6	10.9	13.5	9.7	11.9	9.1	6.4	16.4	3.7
King mackerel *(S. cavalla)*	11.4	12.4	12.4	12.4	11.9	11.9	13.0	16.5	16.8	7.7	7.9	7.8	5.8
Spotted spanish mackerel *(S. maculatus)*	7.0	6.4	7.9	9.0	10.7	6.0	11.3	14.0	6.6	15.0	14.8	15.7	12.8
Others	21.1	24.2	16.4	22.6	24.0	19.7	25.5	19.2	11.2	12.2	10.1	20.6	14.9
Total	84.0	110.4	86.4	125.6	101.6	81.0	88.0	79.7	71.8	58.5	50.2	74.8	57.3

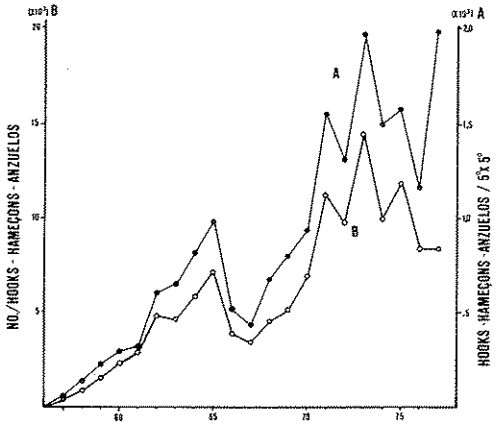


Fig. 1. Annual fluctuation of (A) effort intensity (hooks per 5° square, SCRS/79/54) and (B) total longline effort (hooks, SCRS/79/109-a) in the ICCAT longline yellowfin areas.

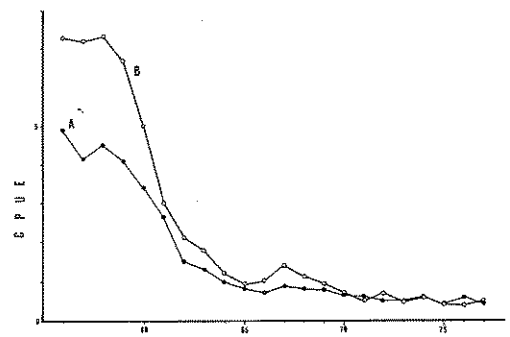


Fig. 2. Catch-per-effort (no. of fish/100 hooks) for the longline fishery in the Atlantic Ocean, 1956-1977 - A = SCRS/79/54; B = SCRS/79/109.

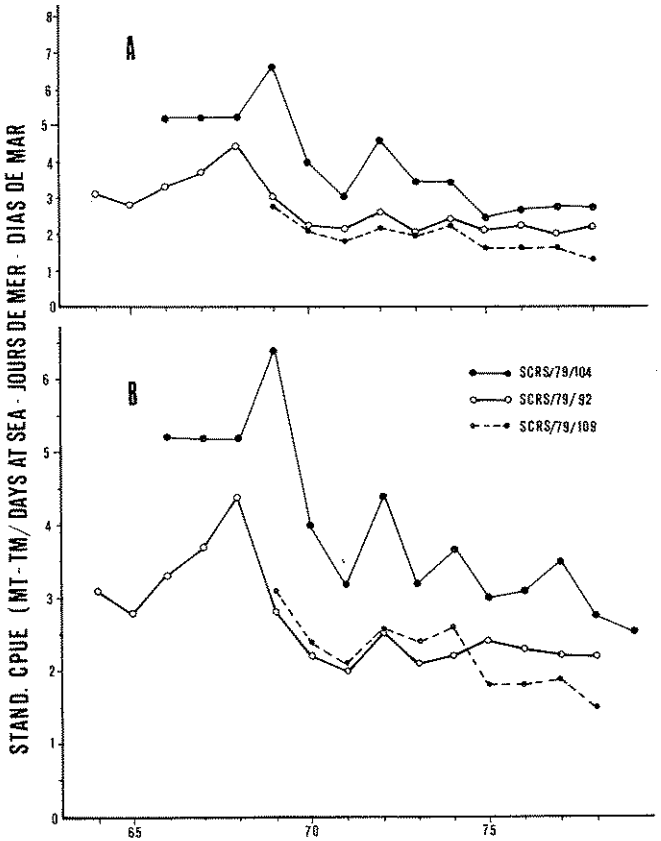


Fig. 3. Standardized yellowfin tuna CPUE (MT/days at sea) estimates for the traditional area (A) and total area (B) of the eastern Atlantic surface fishery from three sources.

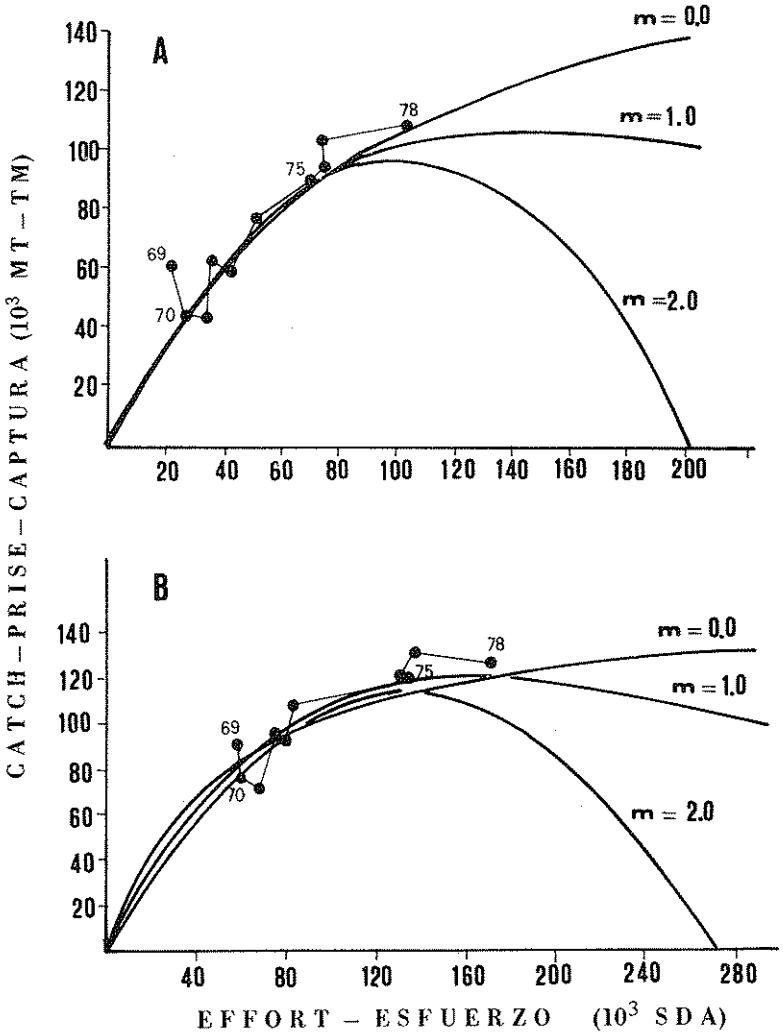


Fig. 4. Yellowfin tuna yield curves relating average sustainable catch to estimated effective fishing effort and assuming a single Atlantic-wide stock - A = SCRS/79/92; B = SCRS/79/109.

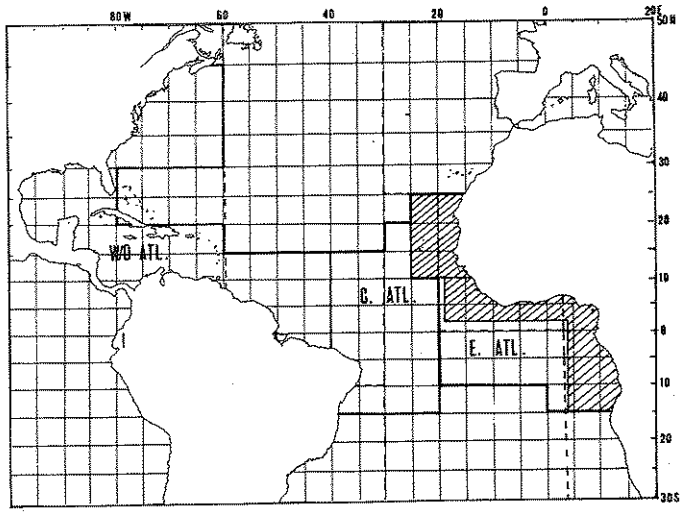


Fig. 5. Yellowfin tuna fishing areas (used in SCRS/79/109) and traditional areas (shaded) for yellowfin fishing in the eastern tropical Atlantic. ICCAT areas are shown by broken lines.

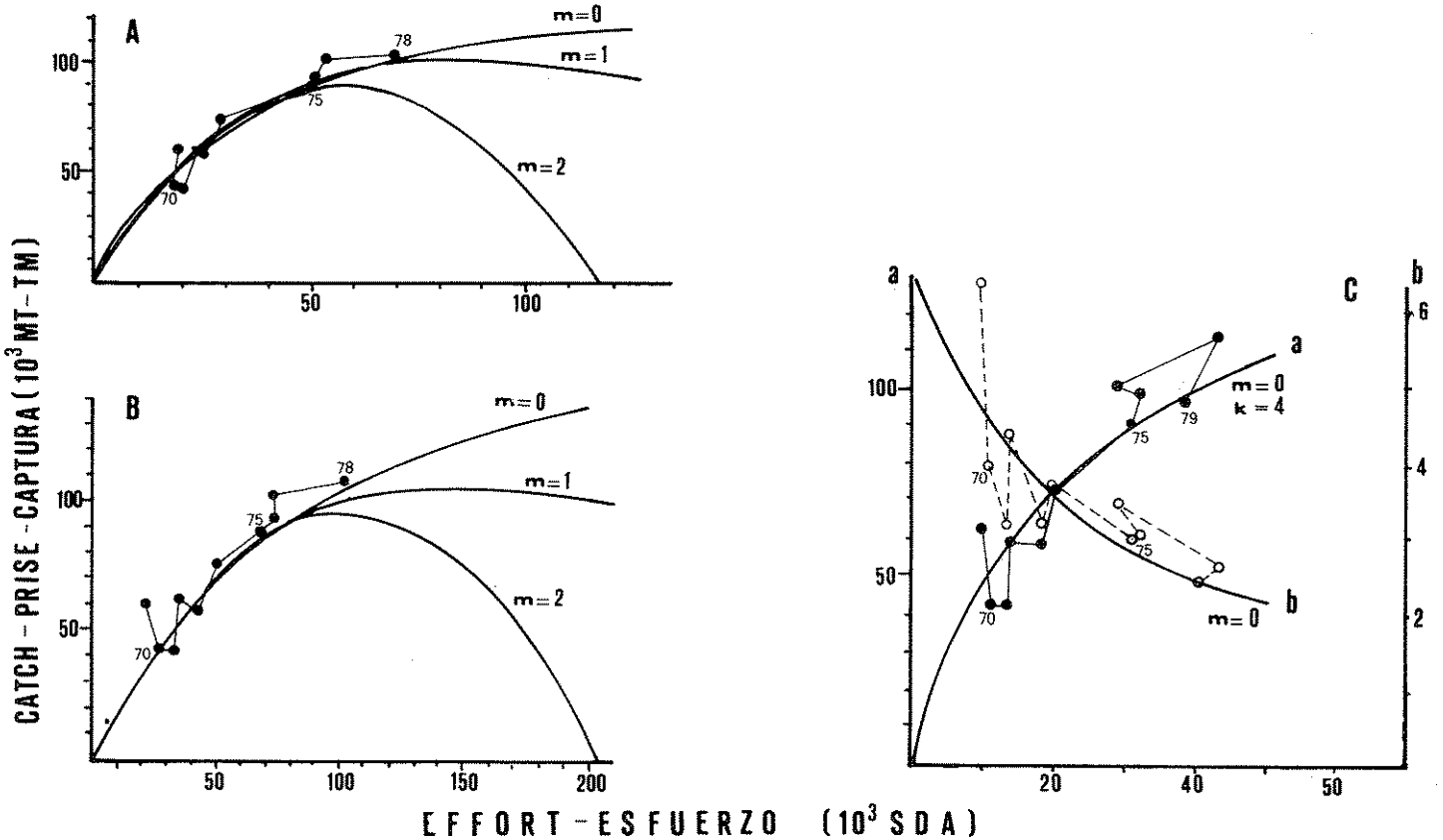


Fig. 6. Yellowfin tuna yield curves relating average sustained catch to estimated effective fishing effort and assuming an eastern Atlantic stock. Based on A = SCRS/79/109-a, B = SCRS/79/92 and C = SCRS/79/104.

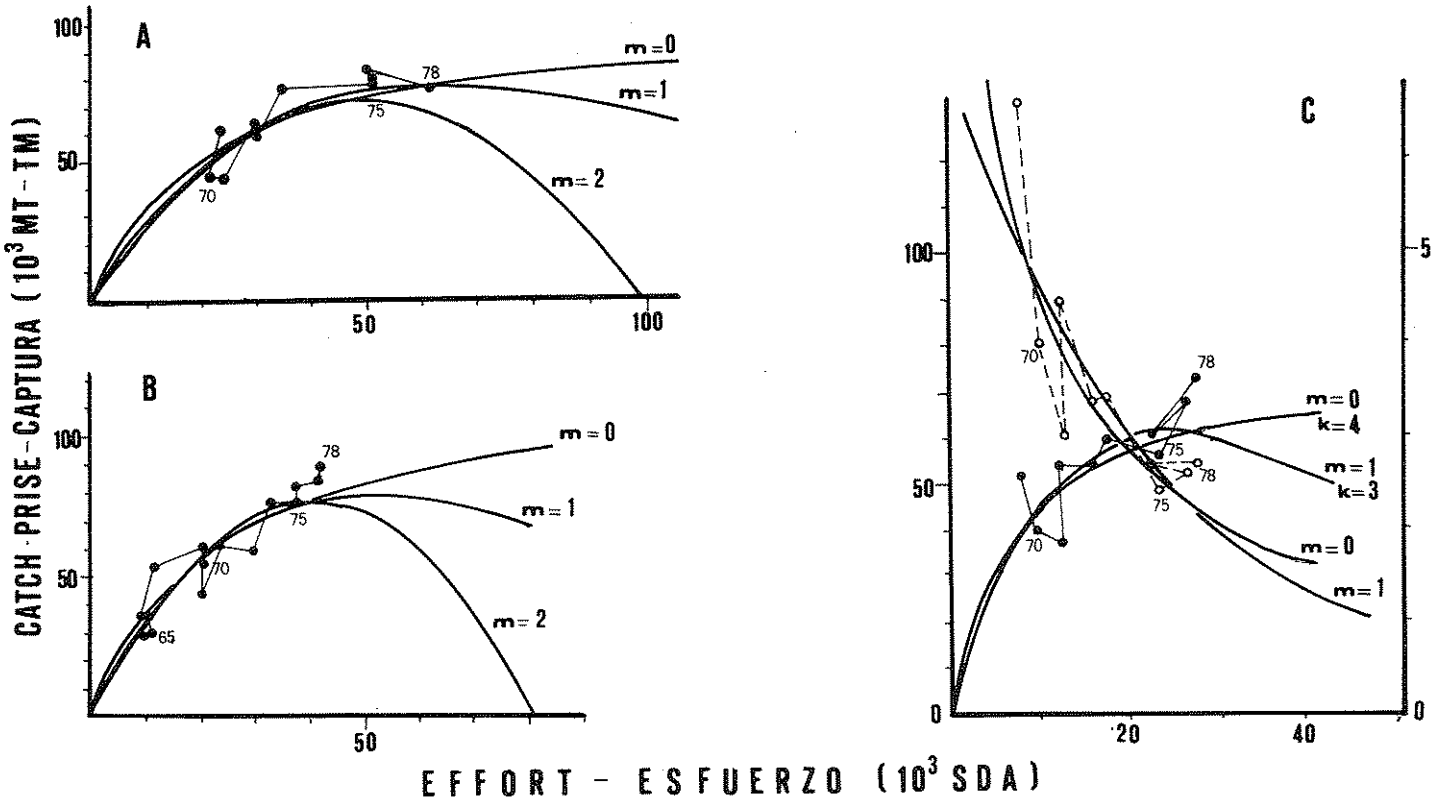


Fig. 7. Yellowfin tuna yield curves relating average sustained catch to estimated effective fishing effort and assuming an inshore stock in the eastern Atlantic. Sources: A = SCRS/79/109-a, B = SCRS/79/92 and C = SCRS/79/104.

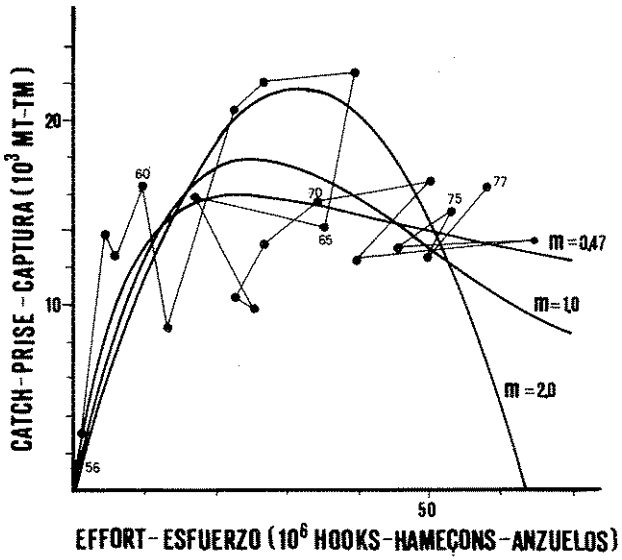


Fig. 8. Yellowfin tuna yield curves relating average sustained catch to estimated effective fishing effort and assuming a western Atlantic stock.

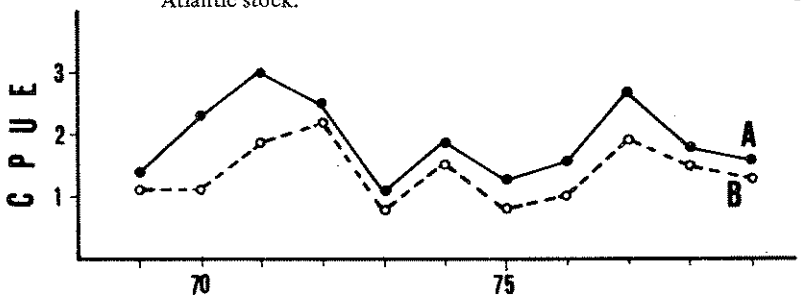


Fig. 9. Development from 1969 to 1973 of standard CPUE (MT/standard days fishing) in the eastern Atlantic, according to SCRS/79/118 (A) and SCRS/79/104 (B).

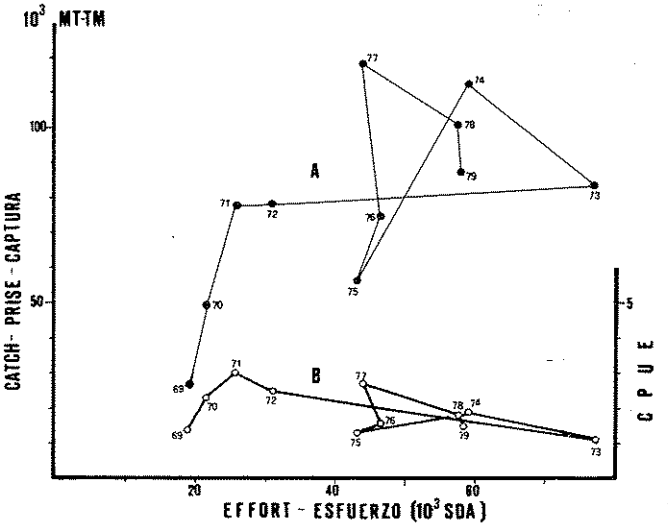


Fig. 10. Relation between catch (MT) vs. effort (standard days fishing) - (A) and CPUE (MT/SDF) vs. effort - (B) for 1969-79. Source: SCRS/79/118. 1979 data are preliminary.

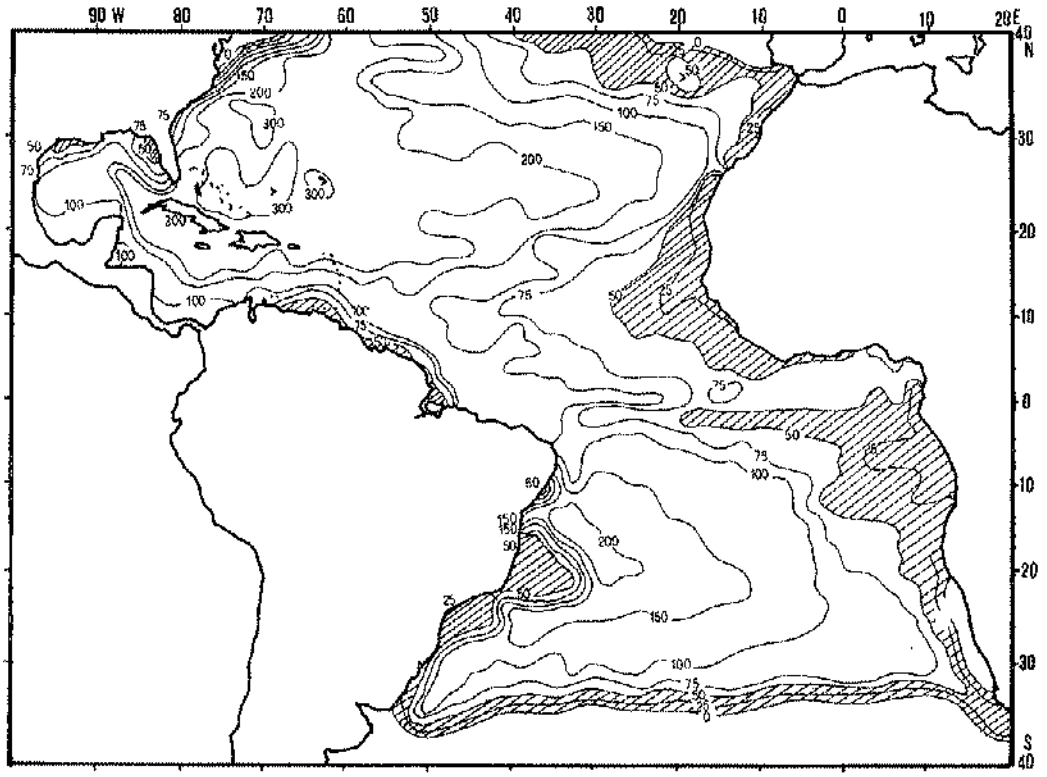
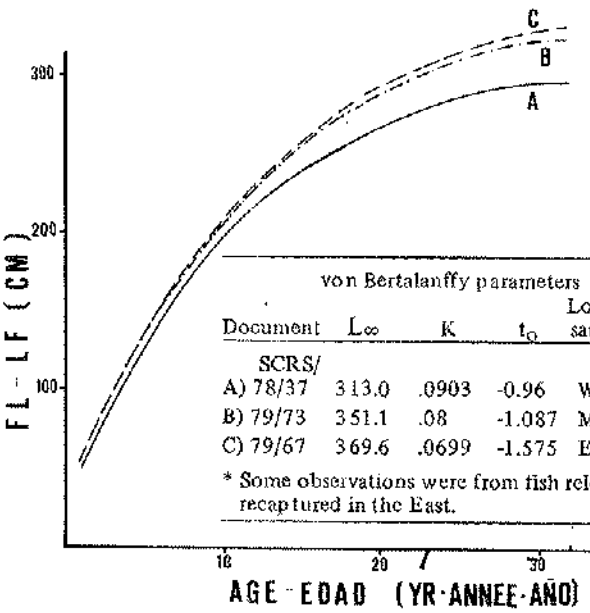


Fig. 11. Annual mean contours of maximum depth of skipjack tuna habitat, derived from graphical integration of Figs. 6 and 7 of SCRS/79/80. Hatch areas indicate habitat depths of less than 50 meters (from SCRS/79/80, Fig. 8).



	von Bertalanffy parameters				
Document	L_∞	K	t_o	Location sampled	Data used
SCRS/					
A) 78/37	313.0	.0903	-0.96	W. Atl.*	Mark-recapture studies
B) 79/73	351.1	.08	-1.087	Med.	Vertebral rings
C) 79/67	369.6	.0699	-1.575	E. Atl.	Dorsal fin ray rings

* Some observations were from fish released in the West Atlantic and recaptured in the East.

Fig. 12. Recently derived growth curves of bluefin tuna.

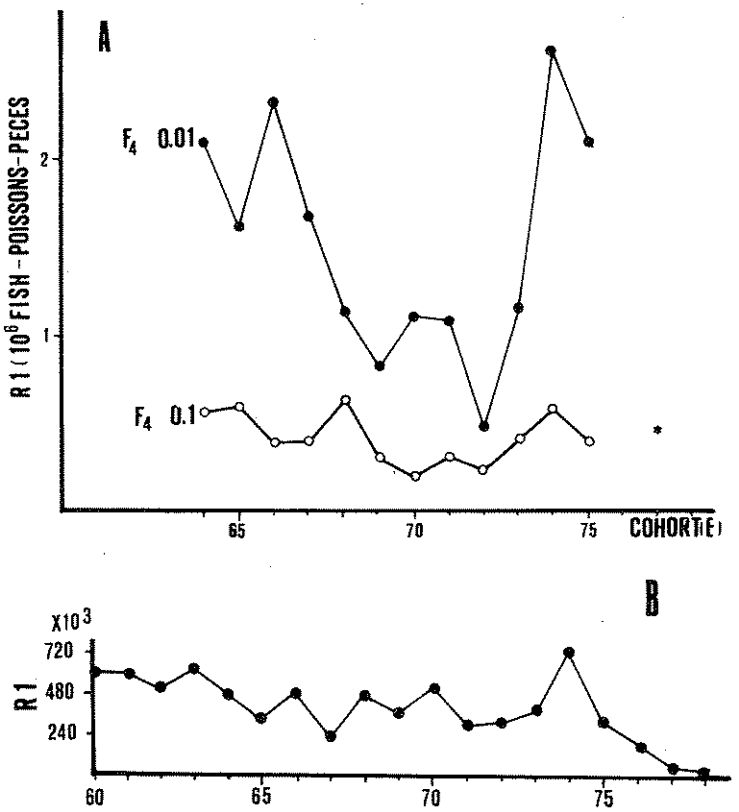


Fig. 13 - a) Age 1 recruitment abundance index (10^6 fish) for the eastern Atlantic (SCRS/79/59); * = direct evaluation.

- b) Estimated age 1 stock size (no. of fish) for the western Atlantic (SCRS/79/98; 1977 and 1978 values are provisional.

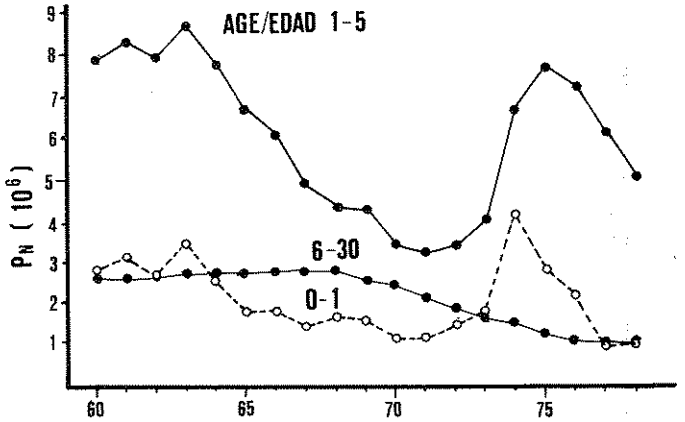


Fig. 14. Estimated stock sizes (no. of fish of bluefin tuna for the total Atlantic (SCRS/79/98).

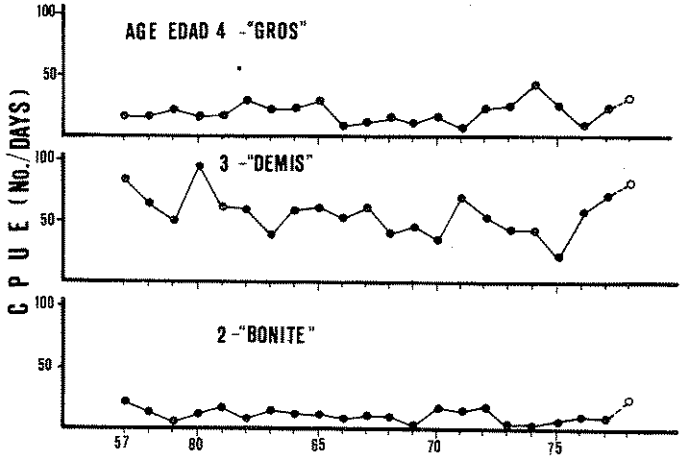


Fig. 15. Catch-per-effort (no. of fish per day) by size classes vs. year of capture, for French-Spanish troll-caught North Atlantic albacore (SCRS/79/86).

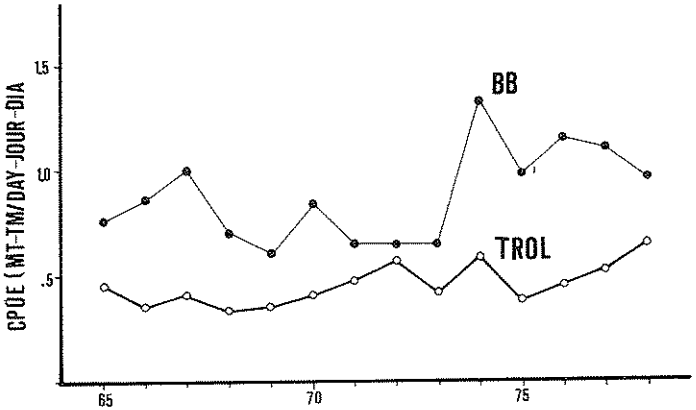


Fig. 16. Catch-per-effort (CPUE = MT/days fishing) vs. time for both the combined French-Spanish troll and baitboat fleets.

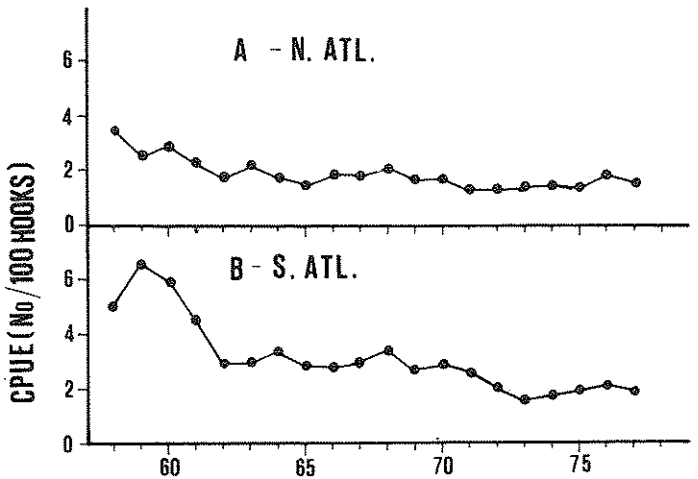


Fig. 17. Annual CPUE (no. of fish/100 hooks) for North and South Atlantic albacore caught by the longline fishery, 1958-77.

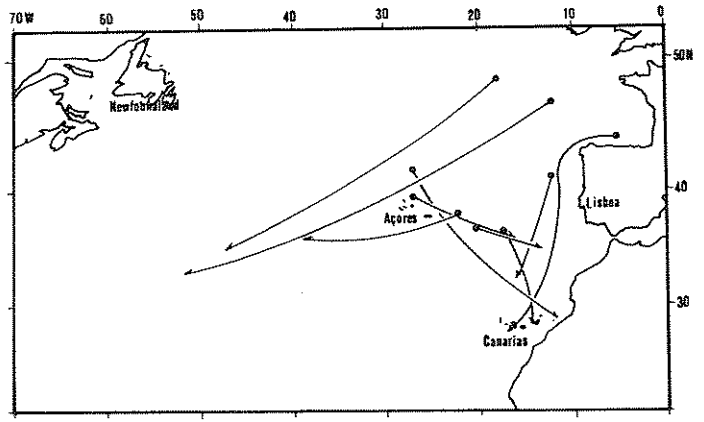


Fig. 18. Long time migrations of albacore in the North Atlantic.

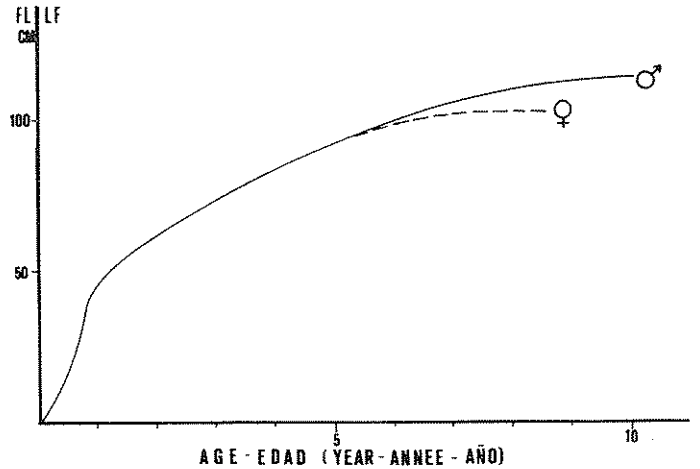


Fig. 19. Composite growth curve for North Atlantic albacore (Source: SCRS/79/69). Note: Growth rate from 0 to 1 year is less sure than the posterior year estimate.

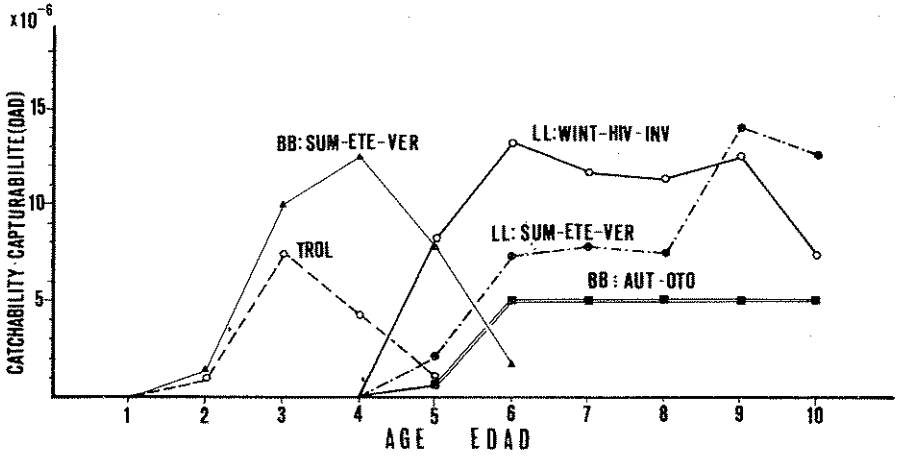


Fig. 20. Catchability pattern by fishing gear exploiting North Atlantic albacore (Source: Table 10, SCRS/79/68).

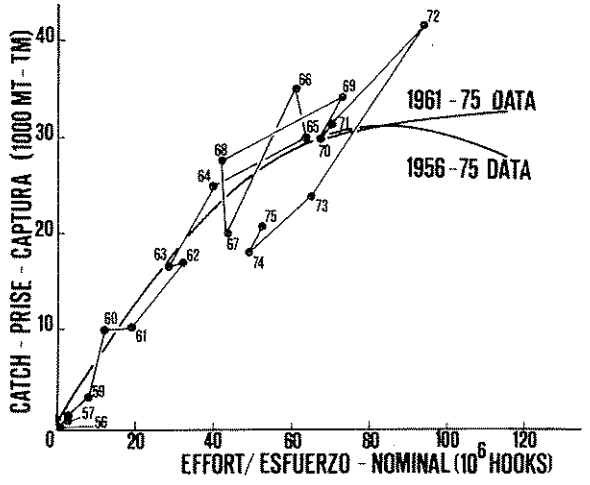


Fig. 21. Production model fitted to South Atlantic albacore catch and effort data for two time series (SCRS/78/77).

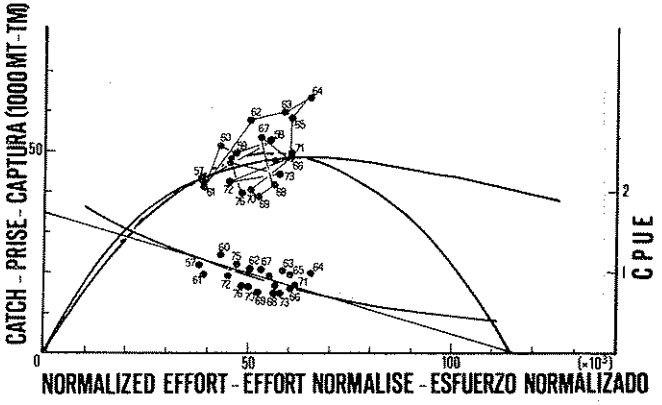


Fig. 22. Production models fitted to North Atlantic albacore catch and effort data (Committee analysis) 1978 SCRS Report.

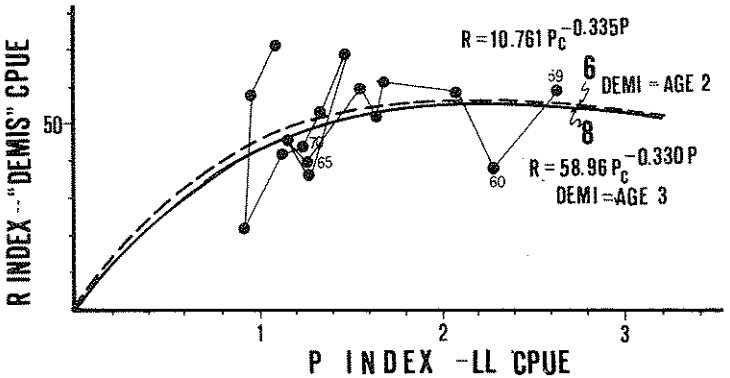


Fig. 23. North Atlantic albacore spawner (P-index in longline CPUE) recruit (R-index CPUE of demis) relationships showing the effort of shifting absolute age (SCRS/79/86).

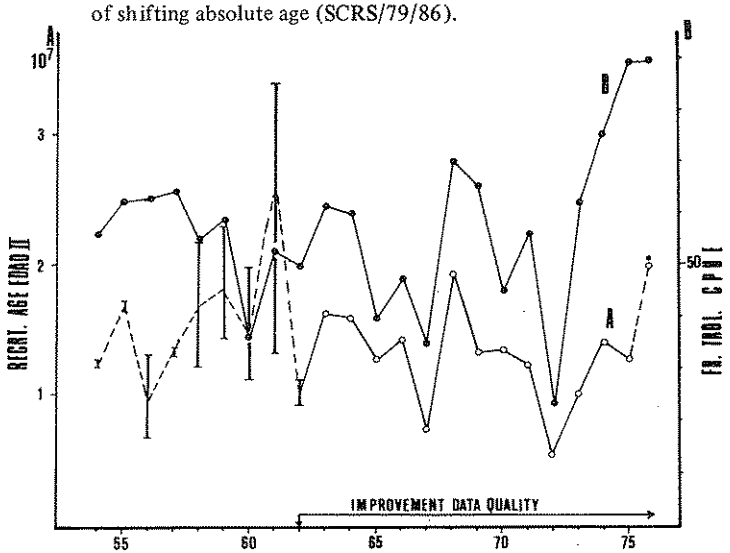


Fig. 25. History of Atlantic albacore cohort recruitment (A) (absolute number of age 2 fish) 1954-75 (SCRS/79/68) and (B) French troll fisheries catch-per-unit-effort (half days). * = Preliminary estimate of the 1976 cohort.

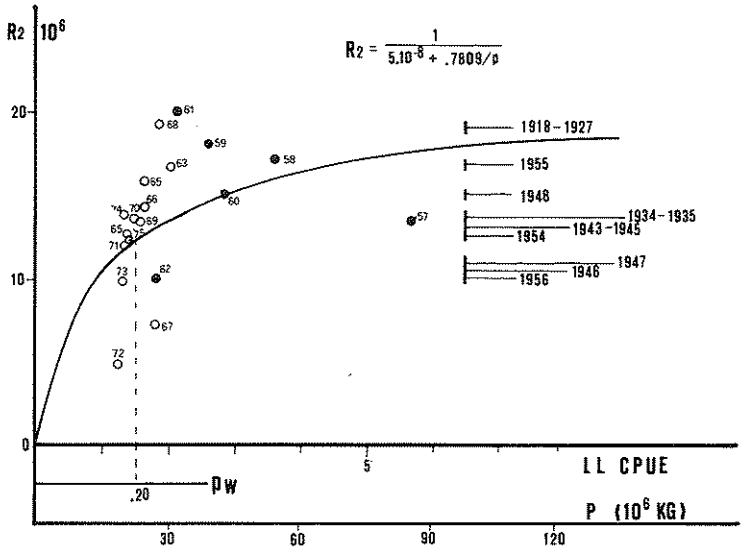


Fig. 24. North Atlantic albacore stock-recruitment relationship, 1954-1975 (SCRS/79/68). P_W = relative fecundity per recruit; P = spawning biomass, R_2 = calculated Age 2 recruitment. Bars on the right side signify historic recruitment levels by multi-cohort analysis; closed circles are the 1957-62 recruitment by cohort analyses and open circles are the recent recruitment by multi-cohort analysis.

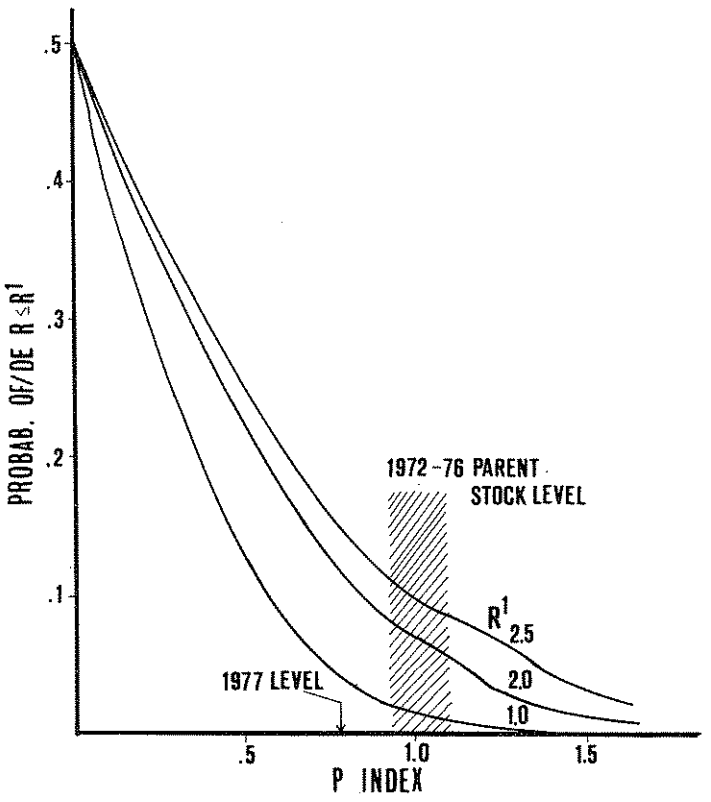


Fig. 26. Probability that the observed recruitment index value (R) will be smaller or equal to some recruitment index value R^1 at any given parent stock index level (P) derived from a simulation analysis on the N. Atlantic spawner-recruit relationship (SCRS/79/86). The lowest R index value observed was 2.5 in 1974.

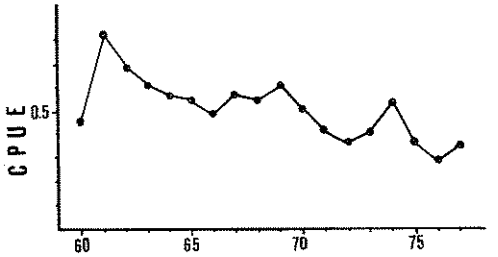


Fig. 27. Annual change in CPUE (hook rate) of Bigeye tuna in the whole Atlantic, based on data of Japanese and Taiwanese longline fisheries combined, 1960-77.

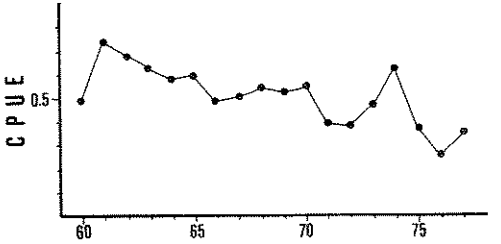


Fig. 28. Annual change in CPUE (hook rate) of Bigeye in the N. Atlantic, based on data of Japanese and Taiwanese longline fisheries combined, 1960-77.

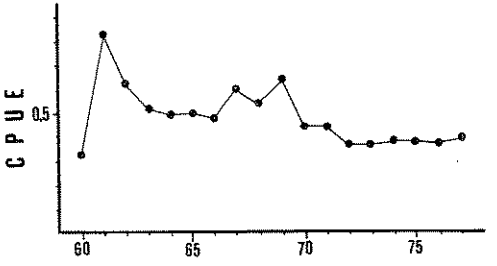


Fig. 29. Annual change in CPUE (hook rate) of Bigeye tuna in the S. Atlantic, based on data of Japanese and Taiwanese longline fisheries combined, 1960-77.

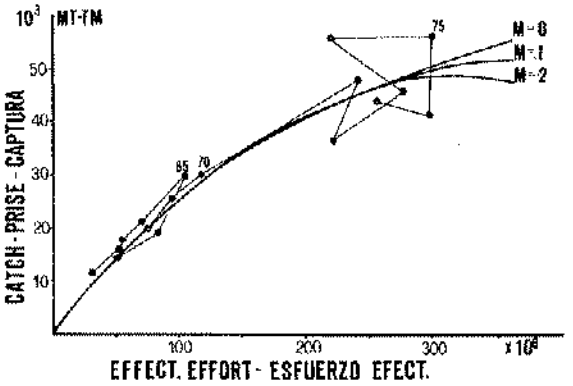


Fig. 30. Yield curve obtained from the production model analysis & observed catch (MT) & effort (effective hooks) for bigeye in the whole Atlantic, 1961-77, (k = 4).

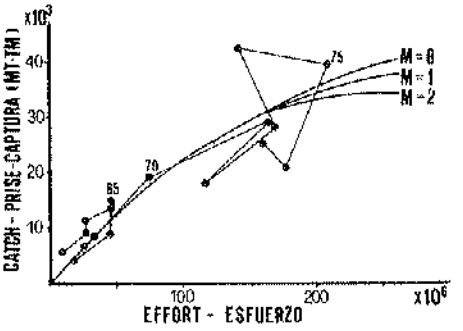


Fig. 31. Yield curves obtained from the production model analysis & observed catch (MT) & effort (effective hooks) for bigeye in the N. Atlantic, 1961-77, (k = 4).

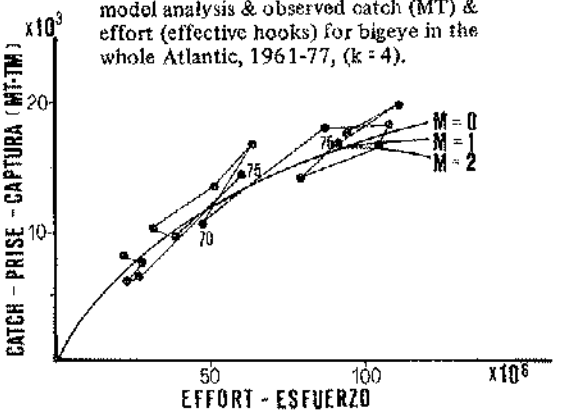


Fig. 32. Yield curves obtained from the production model analysis & observed catch (MT) & effort (effective hooks) for bigeye in the S. Atlantic, 1961-77, (k = 4).

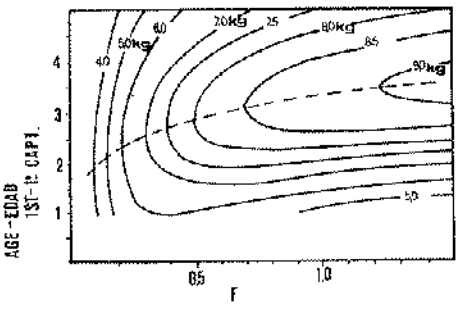


Fig. 33. Isopleths of Y/R of bigeye tuna vs. fishing mortality (F) (SCRS/77/81).

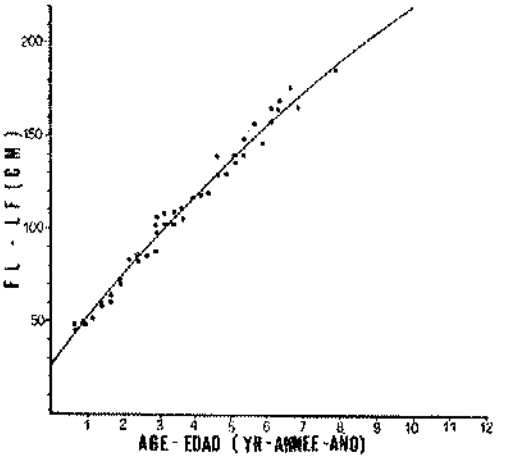
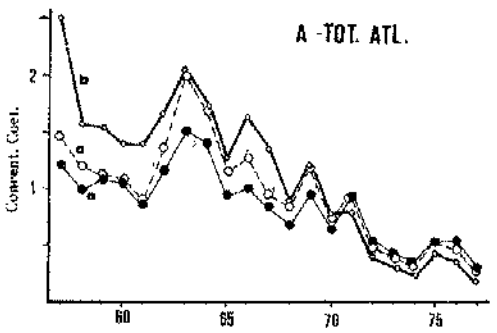
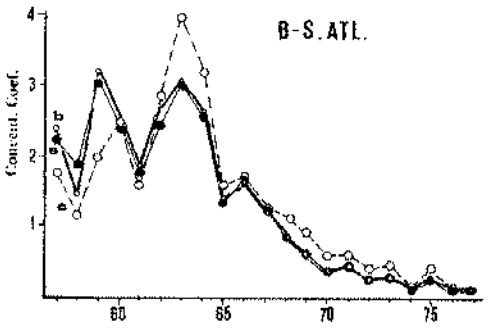


Fig. 34. Length-at-age data from length frequency modal progression analysis and the resulting least-squares von Bertalanffy growth curve (from SCRS/79/77).





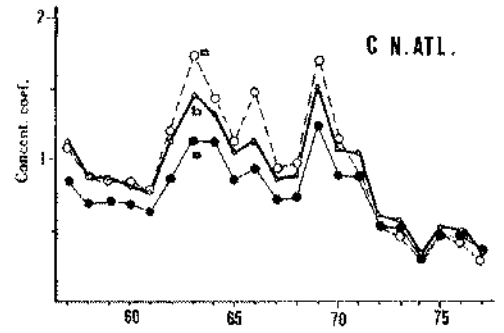
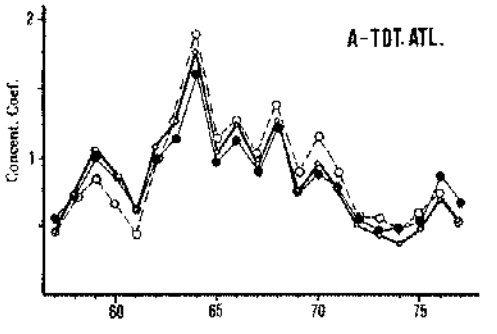
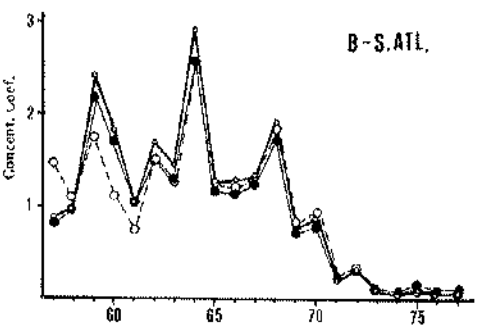


Fig. 35. Concentration coefficients of the Japanese fleet on blue marlin in the Atlantic Ocean, 1957-77, using 3 different standard year periods (a = 1964-72; b = 1965-75; c = 1969-77). The concentration coefficient is the ratio of effective effort to nominal effort & serves as a measure of the effectiveness of a unit of nominal effort over time (SCRS/79/79).





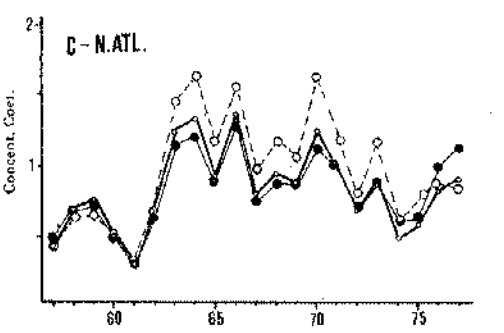


Fig. 36. Concentration coefficients of the Japanese fleet on white marlin in the Atlantic Ocean, 1957-77, using 3 different standard year periods (a = 1964-72; b = 1965-75; c = 1969-77). The concentration coefficient is the ratio of effective effort to nominal effort and serves as a measure of the effectiveness of a unit of nominal effort over time (SCRS/79/79).

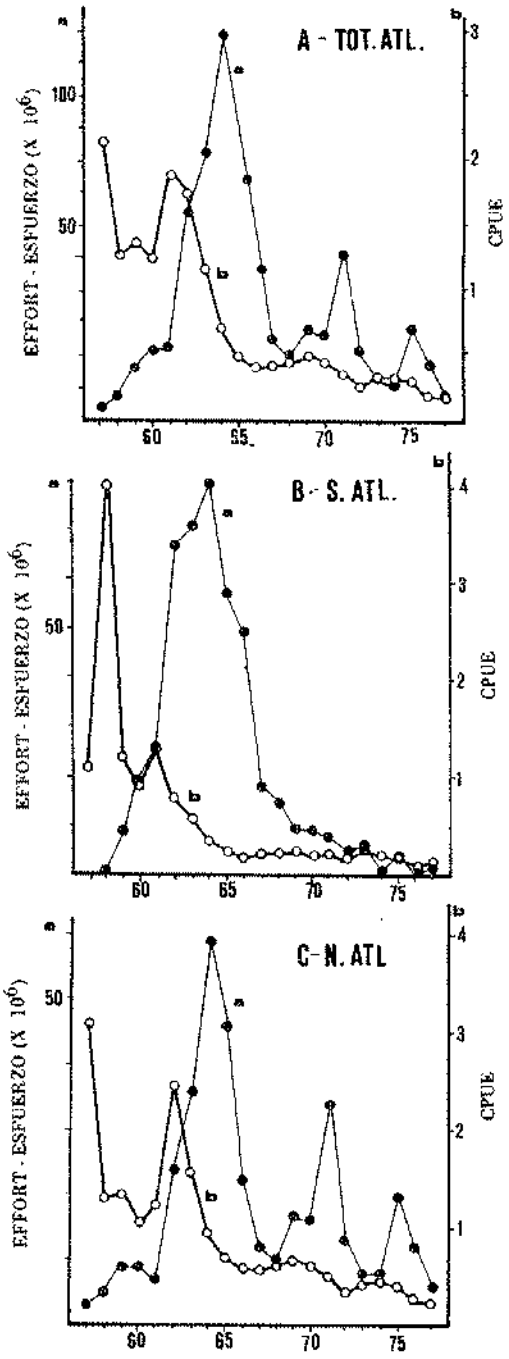


Fig. 37. Effective effort (no. hooks) and catch-per-unit-effort (fish per 1000 hooks) for blue marlin in the Atlantic Ocean, 1957-77. All data are from the Japanese longline fishery (SCRS/79/79).

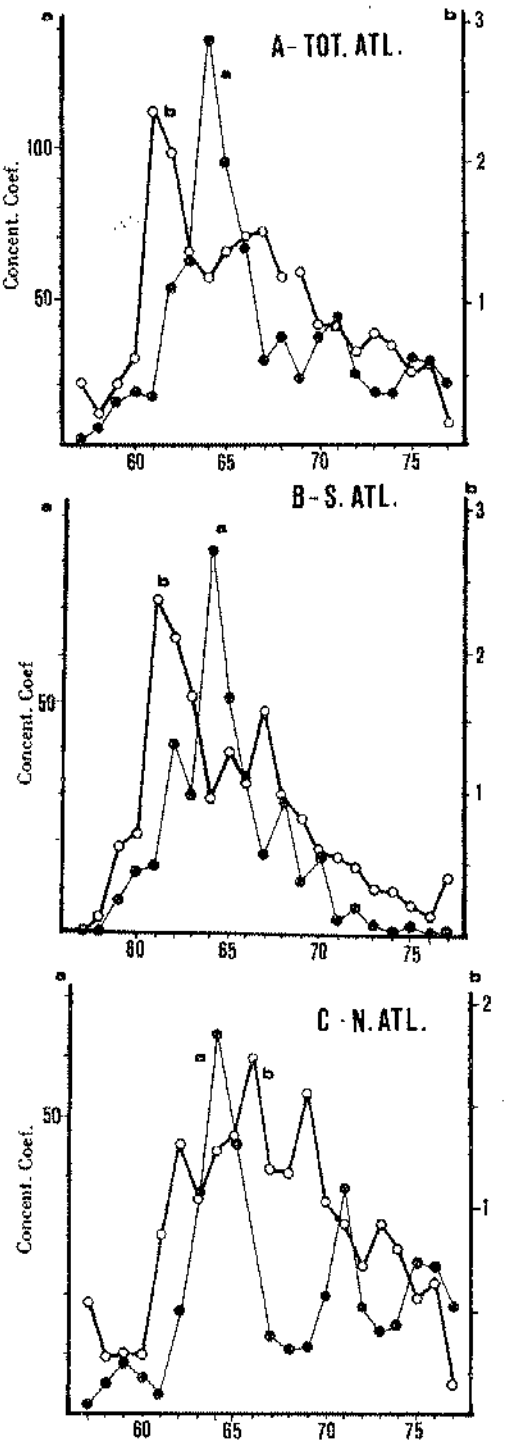


Fig. 38. Effective effort (no. hooks) and catch-per-unit-effort (fish per 1000 hooks) for white marlin in the Atlantic Ocean, 1957-77. All data are from the Japanese longline fishery (SCRS/79/79).

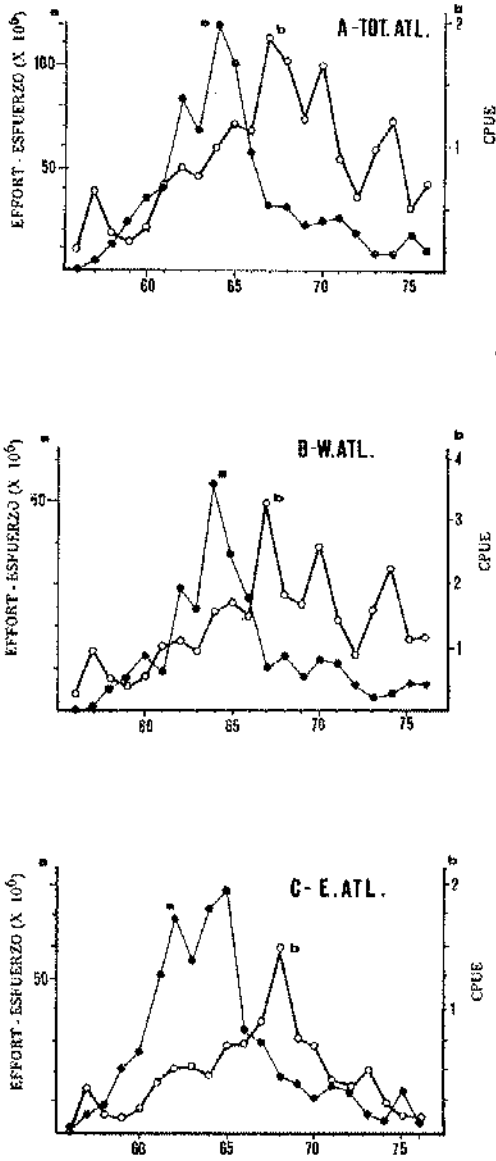


Fig. 39. Effective effort (no. of hooks) and catch-per-unit-effort (fish per 1000 hooks) for sailfish/spearfish in the Atlantic Ocean, 1956-76. All data are from the Japanese longline fishery (SCRS/79/93).

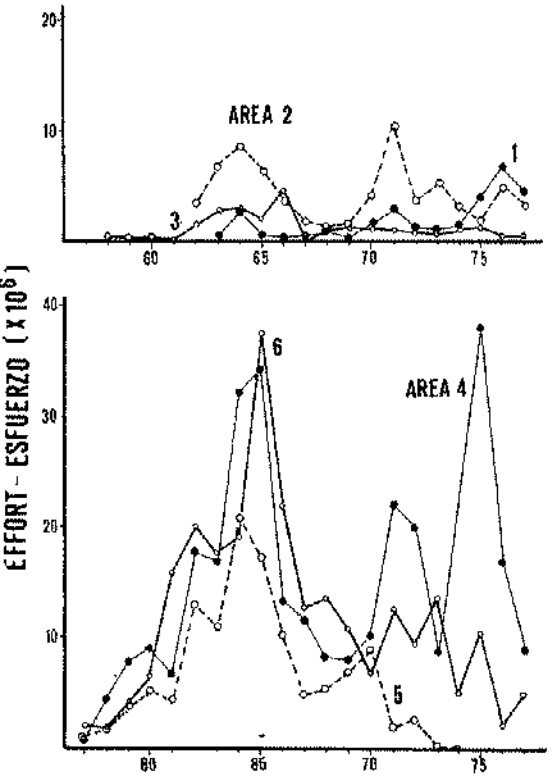


Fig. 40. Change in Japanese nominal effort (no. of hooks) for ICCAT billfish areas from 1956 to 1977 (SCRS/79/64).

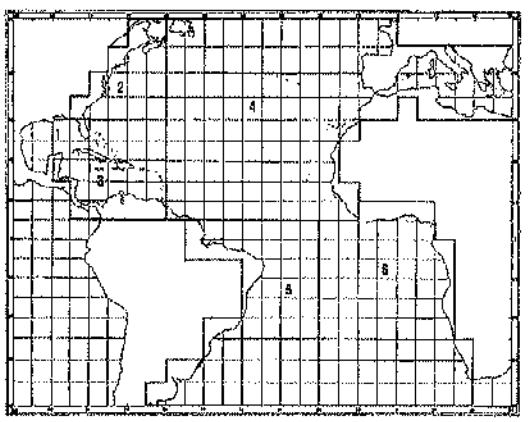
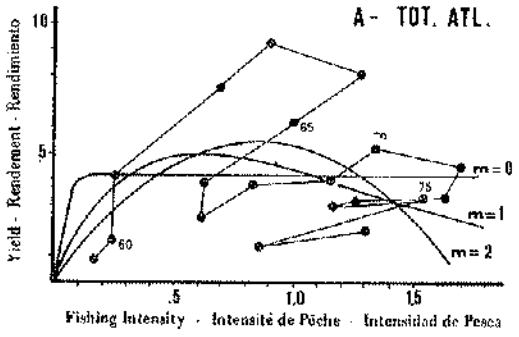
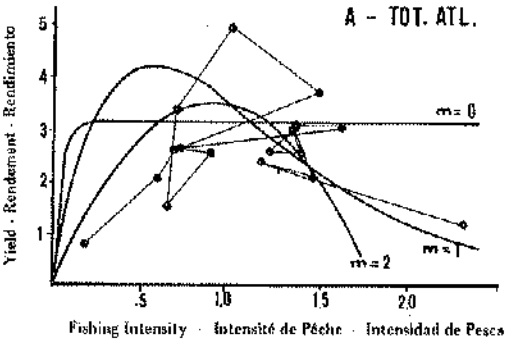
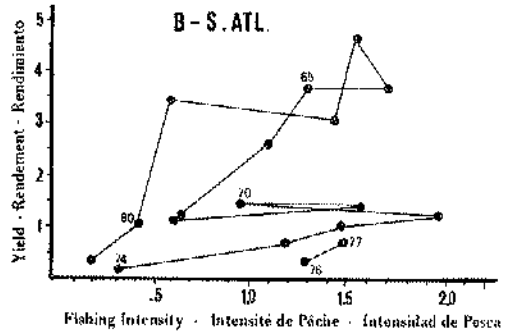
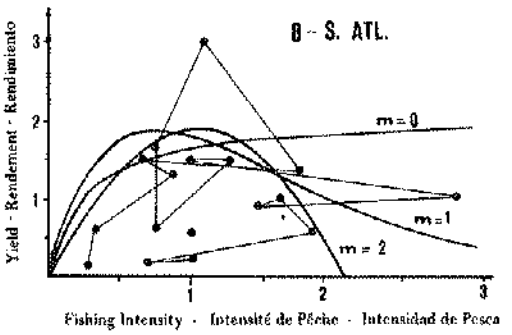


Fig. 41. ICCAT billfish areas (SCRS/79/64).









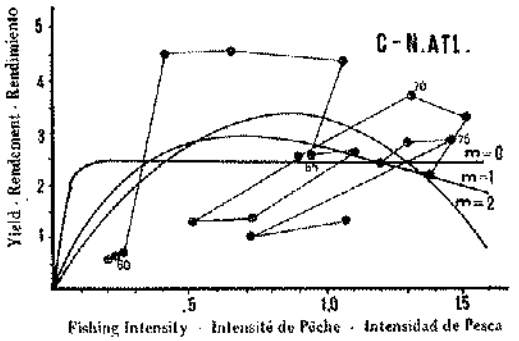


Fig. 42. Equilibrium yield curves and observed data of yield (MT) and fishing intensity (10^6 hooks per 5 x 5 area) for blue marlin in the Atlantic Ocean under two stock structure hypotheses and assuming five significant year-classes in the catch (SCRS/79/79).

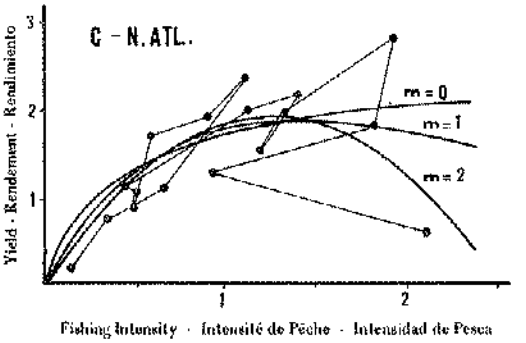


Fig. 43. Equilibrium yield curves and observed data of yield (MT) and fishing intensity (10^6 hooks per 5 x 5 area) for white marlin in the Atlantic Ocean under two stock structure hypotheses and assuming four significant year-classes in the catch.

Appendix 1 to Annex 7

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. Report of the SCRS Officers Meeting
6. Report of the Working Group on Juvenile Tropical Tunas
7. Report of the Bluefin Workshop
8. Review of progress made on assignments for juvenile tropical tuna studies
9. Report of the Sub-Committee on Skipjack
10. Review of the Skipjack Year Program
11. Review of national fisheries and research programs
12. Review of conditions of stocks, with brief presentation of major papers on this subject:
    a) Yellowfin
    b) Skipjack
    c) Bluefin
    d) Albacore
    e) Bigeye
    f) Billfishes
    g) Southern bluefin
    h) Small tunas
    i) Multispecies interactions
13. Report of the Sub-Committee on Statistics
14. Report of the Working Group on Data Management
15. Review of Atlantic tuna statistics and data management system
16. Review of SCRS research programs and consideration of future plans
17. Assignments and responsibilities of each scientist
18. Cooperation with other organizations
19. Report of the Working Group on Publication Policy
20. Scientific publications
21. Progress made by the Secretariat regarding assignments given to it
22. Identification of questions asked of the SCRS, recommendations and priorities
23. Date and place of next meeting
24. Other matters
25. Election of Chairman and nomination of Sub-Committee Conveners
26. Adoption of Report
27. Adjournment

Appendix 2 to Annex 7

LIST OF DOCUMENTS

SCRS/79/1	Tentative Agenda of the SCRS.
2	Annotated Tentative Agenda of the SCRS.
3	Tentative Time Schedule of the SCRS.
4	Tentative Agenda of the Sub-Committee on Statistics.
5	Ad hoc Inter-Agency Consultation on Atlantic Fishery Statistics. (Warsaw, September 29-29, 1979).
6	Collective Volume of Scientific Papers, Vol. VIII (1).
7	Collective Volume of Scientific Papers, Vol. VIII (2).
8	Data Record, Vol. 12.
9	Data Record, Vol. 13.
10	Data Record, Vol. 14.
11	Statistical Series-7.
12	Statistical Series-8.
13	Progress Report on the ICCAT Data Bases.
14	Estimation de la répartition entre l'est et l'ouest de l'Atlantique des captures d'albacore (yellowfin), par l'ensemble des flottilles palangrières.
15	Estimation de la répartition entre le nord et le sud de l'Atlantique des captures de germon de l'ensemble des flottilles palangrières.
16	Secretariat Report Concerning the Working Group on Data Management.
17	International 3-letter Species Identifiers.
18	Report of the 1978 SCRS Meeting.
19	1979 SCRS Report.
20	Statistical Bulletin, Vol. 9.
21	Field Manual for Statistics and Sampling Atlantic Tunas and Tuna-Like Fishes (2nd edition) – French and Spanish versions. (The English version was distributed in 1978 as document COM-SCRS/78/13.).
22	Secretariat Report on Statistics and Coordination of Research.
23	Report of the 1979 SCRS Officers Meeting (Las Palmas, July 26-28, 1979).
24	Report of the Sub-Committee on Skipjack (Las Palmas, July 23-27, 1979).

25 Report of the Bluefin Workshop (Santander, September 3-8, 1979).

26 Report of the Joint CECAF/ICCAT Working Group on Juvenile Tropical Tunas (Abidjan, September 17-21, 1979).

27 National Report of China (Taiwan), 1978 – R. T. Yang.

28 Distribution of fishing effort and catch of albacore by Taiwan's tuna longline fleet in the North and South Atlantic Ocean, 1972-78 – R. T. Yang.

29* Composición por largo y proporción entre los sexos del atún aleta amarilla (*Thunnus albacares*) en el Atlántico centro-oriental – A. Rodríguez, S. Valle, R. Valdés.

30* Intensidad total de pesca de la pesquería con palangre de Cuba para el atún aleta amarilla (*Thunnus albacares*) en el océano Atlántico, 1973-77 – S. Valle, A.Rodríguez.

31* Contenido estomacal del atún de aleta amarilla (*Thunnus albacares*) en el Atlántico centro-oriental – S. Valle, N. Mezentseva, A. Rodríguez.

32* Nota sobre el contenido estomacal del atún ojo grande (*Thunnus obesus*) en el Atlántico centro-oriental – S. Valle, N. Mezentseva, A. Rodríguez.

33* Análisis de cohortes de la pesquería del atún ojo grande (*Thunnus obesus*) en el océano Atlántico – S. Valle, A. Rodríguez.

34* A study of some biological aspects of the fishing of blackfin tuna (*Thunnus atlanticus*, Lesson) in the State of Rio Grande de Norte Brasil – J. Vasconcelos, P. Conolly.

35* Remarques sur la croissance du germon – S. B. Hue.

36* Length-age composition of the tropical Atlantic swordfishes, (*Xiphias gladius* L.) – V. V. Ovchinnikov, M. E. Grudtsev, S. V. Kholodkova.

37* Some problems of reproductive biology of oceanic and neritic tunas of the tropical Atlantic – F. E. Alekseev, E. I. Alekseeva.

38* Data on length-age composition and gonad maturity stages of skipjack (*Katsuwonus pelamis*) of the eastern tropical Atlantic – V. N. Chur, V. B. Grudinin, V. L. Zharov.

39* Dependence of the mass of bigeye tuna (*Thunnus obesus*) of the tropical part of the Atlantic Ocean on the length – V. N. Chur, N. V. Krasovskaya.

40* On age and growth of the Atlantic bigeye tuna – V. V. Gaikov, V. N. Chur, V. L. Zharov, Yu. P. Fedoseev.

41* Relationship between feeding intensity of bigeye tuna (*Thunnus obesus*) of the Gulf of Guinea and their catches in the day time – Yu. P. Fedoseev, V. N. Chur.

42* Main results of the tuna, swordfish and sailfish studies in the Atlantic Research Institute for the Fisheries and Oceanography (Atlantniro) for the 20 year period (1957-77) – Yu. A. Vjalov, V.V. Ovchinnikov.

43 Reproducción del pez espada (*Xiphias gladius*) (1758) en el Sudeste y Sur del Brasil – A. Ferreira de Amorim, C. A. Arfelli.

44 South African National Report – C. S. de V. Nepgen.

45 (Rev.) Comparison between the estimated reproductive stocks of bluefin tuna (*T. thynnus*) of the Gulf of Mexico and western Mediterranean – A. Dicenta, C. Piccinetti, et al.

46 Rapport de recherches 1978 pour la France. – H. Aloncle.

47 Campagne de prospection du germon de surface dans le Nord Ouest Atlantique (Atlanthon 79 - 11 juillet - 11 août) – H. Aloncle.

48 Reprise des thonidés marqués par l'ISTPM en Atlantique Nord (*T. alalunga, T. obesus, T. thynnus*) – H. Aloncle, F. Delaporte.

49 Distribution of larvae of the yellowfin tuna and skipjack in the Atlantic Ocean (Preliminary) – S. Kikawa, Y. Nishikawa.

50 Document withdrawn.

51 Croissance de l'albacore (*Thunnus albacares*) de l'Atlantique est – A. Fonteneau.

52 Evolution numérique et pondérale des calées de la flottille de senneurs FISM ayant debarqué à Abidjan de Janvier 1976 à Juillet 1979 – J. J. Levenez, A. Fonteneau, R. Regalado.

53 Estimation of overall fishing intensity of Atlantic longline albacore, 1956-77 – T. Shiohama.

54 Overall fishing intensity, catch, catch by size and spawning indices of yellowfin tuna in the Atlantic tuna longline fishery, 1956-77 – M. Honma.

55 Extracción de otolitos en *Katsuwonus pelamis* (Linnaeus) – C. A. Arfelli, A. Ferreira de Amorim.

56 Identificación y distribución de escombridos (*Sardini* y *Thunnini*) colectados en contenido estomacal de atunes y afines capturados en el Sudeste y Sur del Brasil (Informe Preliminar) – L. A. Zavala Camin, R. W. von Seckendorff.

57 Ocurrencia de jovenes de caballa (*Scomber japonicus*) Houttuyn 1780 en el Sudeste del Brasil (20°S-27°S), obtenida por medio de colectas de contenido estomacal de atunes y afines (Informe Preliminar) – L. A. Zavala Camin, R. W. von Seckendorff.

* Document presented too late to be accepted at the 1978 SCRS Meeting.

58 Analysis on the Atlantic bluefin tuna stock – C. Shingu, K. Hisada.

59 Evaluation du recrutement apparent de thon rouge (*Thunnus thynnus*) en Atlantique est à l'ouest de Gibraltar – F. X. Bard, J. L. Cort

60 La pesquería vasca de atún rojo (*Thunnus thynnus*) del Golfo de Vizcaya, 1966-79 – J. L. Cort, F. X. Bard.

61 An aspect on catch of three major species, skipjack, yellowfin and bigeye tunas, taken by the Japanese baitboat fleet based in Tema, 1969-78 – Z. Suzuki.

62 Overall fishing intensity of the Atlantic longline fishery for bigeye tuna, 1956-77 – S. Kume.

63 A production model approach to evaluate recent bigeye stock conditions in the Atlantic – S. Kume.

64 Recent trends in catch, effort and size for white and blue marlins based on data from the Japanese Atlantic fishery – S. Kikawa, M. Honma.

65 Experiencias de marcado de atún rojo (*Thunnus thynnus*) en el Golfo de Vizcaya por el procedimiento del cebo vivo – J. L. Cort, E. de Cárdenas, J. C. Rey.

66 Pesquería española de cerco de túnidos tropicales. Comentarios sobre su evolución en el periodo 1967-79 – A. M. Fernández, J. M. García Mamolar.

67 Age and growth of East Atlantic bluefin tuna as determined by reading of fin rays cross section – G. Compean Jimenez, F. X. Bard.

68 Etat du stock de germon (*Thunnus alalunga*) Nord Atlantique en 1979 – F. X. Bard, A. Gónzalez-Garcés.

69 Conséquences pour l'évaluation du taux d'exploitation du germon (*Thunnus alalunga*) Nord Atlantique d'une courbe de croissance déduite de la lecture des sections de rayons épineux – F. X. Bard, G. Compean Jimenez.

70 Summary of the study on the heterogeneity of the stock of albacore (*T. alalunga*) in the northeast Atlantic – S. B. Hue.

71 New knowledge on the migration of albacore (*T. alalunga*) in the northeast Atlantic – S. B. Hue.

72 Résultats de la campagne de pêche au thon rouge en Méditerranée française en 1978 – H. Farrugio.

73 Age et croissance du thon rouge (*Thunnus thynnus*) dans la pêcherie française de surface en Méditerranée – H. Farrugio.

74 Validité des captures de thon rouge à la senne tournante en Méditerranée, considérées comme index d'abondance – C. Piccinetti, H. Farrugio.

75 Note on relationship between recently acquired mark recapture data and existing age estimates for Atlantic bluefin tuna – F. J.Mather.

76 A preliminary note on migratory tendencies and distributional patterns of Atlantic bluefin tuna based on recently acquired and cumulative tagging results – F. J. Mather.

77 An analysis of Atlantic bigeye tuna (*Thunnus obesus*) growth – E. Weber.

78 An analysis of billfish catch and effort data from the recreational and longline fisheries in the northern Gulf of Mexico – R. J. Conser, G. L. Beardsley.

79 An assessment of the status of stocks of blue marlin and white marlin in the Atlantic Ocean – R. J. Conser.

80 Atlantic skipjack tuna: influences of the environment on their vulnerability to surface gear – R. H. Evans, D. R. McLain, R. A. Bauer.

81 Distribution and abundance of bluefin tuna larvae in the Gulf of Mexico in 1977 and 1978 – W. J. Richards, T. Potthoff.

82 Ectoparasites of eastern and western Atlantic bluefin tunas – V. Walters.

83 The effects of unevenly distributed catches on virtual population analysis – S. E. Sims, M. L. Parrack.

84 Estimates of shedding rates of two types of dart tags from northwestern Atlantic bluefin tuna (*Thunnus thynnus*) – R. E. Baglin, M. I. Farber, W. H. Lenarz, J. M. Mason.

85 An evaluation of the adequacy of available length-frequency and catch-effort data for determining the effectiveness of alternate management actions designed to raise the yield-per-recruit of yellowfin tuna in the eastern tropical Atlantic – A. L. Coan, N. W. Bartoo, S. M. Moore.

86 Further analysis on spawner/recruit relationships for the North Atlantic albacore – N. W. Bartoo.

87 Larval distributions of scombrids (other than bluefin tuna) and swordfish in the Gulf of Mexico in the spring of 1977 and 1978 – W. J. Richards, T. Potthoff.

88 Length and weight parameters of western Atlantic bluefin tuna (*Thunnus thynnus*) – R. E. Baglin, M. I. Farber.

89 Potential yields of bluefin tuna under independent management of the east and west Atlantic fisheries – S. Nichols.

90 A preliminary analysis of mortality of bluefin tuna (*Thunnus thynnus*) tagged in the northwestern Atlantic Ocean – M. I. Farber.

91 Preliminary report on the age and growth of king mackerel, (*Scomberomorus cavalla*) from the United States – A. G. Johnson, W. A. Fable, L. E. Barger, M. L. Williams.

92 Production model analyses from Atlantic yellowfin tuna (*Thunnus albacares*) 1964 to 1978: How are the conclusions affected by current CPUE estimates? – A. L. Coan.

93 Production model analysis of the sailfish and spearfish stocks in the Atlantic Ocean – R. J. Conser.

94 Size and possible origin of sailfish (*Istiophorus platypterus*) from the eastern Atlantic Ocean – G. L. Beardsley.

95 A summary and discussion of technical information pertaining to the geographical discreteness of Atlantic bluefin tuna resources – S. Brunenmeister.

96 Electrophoretic study of Atlantic bluefin tuna (*Thunnus thynnus*) from the eastern and western North Atlantic Ocean – H. C. Thompson, R. F. Contin.

97 A synopsis of the biology of the broadbill swordfish (*Xiphias gladius*) (Linnaeus, 1758) – B. J. Palko, G. L. Beardsley, W. J. Richards.

98 Trends on the abundance and age structure of Atlantic bluefin tuna – M. L. Parrack.

99 An update of U. S. bluefin tuna tagging – M. I. Farber, T. W. Chewning.

100 Document withdrawn.

101 Ontogenia de la columna vertebral del *Auxis thazard* (Lacépède, 1802) y revisión de las características de las especies consideradas en el genero *Auxis* – L. A. Zavala Camin.

102 Japanese tuna fishery and research in the Atlantic, 1978-79 – S. Kume.

103 Prises de la flottille thonière franco-ivoiro-sénégalaise et température de surface en 1977 – M. Bages, A. Fonteneau.

104 Analyse de l'etat des stocks d'albacore (*Thunnus albacares*) et de listao (*Katsuwonus pelamis*) de l'Atlantique est au 30 septembre 1979 – A. Fonteneau et P. Cayré.

105 Résultats d'une enquête sur l'importance des dauphins dans la pêcherie thonière FISM – J. Levenez, A. Fonteneau, R. Regalado.

106 Document withdrawn.

107 Analyse multicohorte sur deux classes d'age – A. Laurec, F. X. Bard.

108 Document withdrawn.

109 a) Analyse de la prise, de l'effort et de la prise par unité d'effort "annuelle" de la pêche palangrière (1956 à 1977) et de surface (1969 à 1978) du yellowfin (*Thunnus albacares*) de l'Atlantique – E. Yanez.

109 b) Analyse de la prise par unité d'effort "saisonnière" et de l'évolution de l'indice gonado-somatique de la pêche palangrière (1956 à 1977) et de surface (1969 à 1978) du yellowfin (*Thunnus albacares*) de l'Atlantique – E. Yanez, M. A. Barbieri B.

110 Document received too late to be accepted at 1979 SCRS.

111 Canadian national Report – T. D. Iles, P. Hurley, C. Burnett.

112 Report of the Canadian research program on large pelagic fishes – P. Hurley, T. D. Iles.

113 Preliminary analysis of catch and effort data for the Canadian bluefin tuna rod and reel fishery – P. Hurley, G. Black, C. Burnett, T. D. Iles.

114 Informe nacional de España – A. González-Garcés.

115 Analisis preliminar de la pesca palangrera en el Golfo de Mexico: Japon de 1963 a 1976 – G. Compean Jiménez, E. Yanez.

116 Currently logged catch and CPUE of Japanese baitboat fishery based at Tema, up to August 1979 – S. Kume.

117 Review of United States fisheries and research activities on tunas and tuna-like fishes of the Atlantic Ocean for 1978-79 – SWFC-SEFC.

118 La pêcherie de listaos (*Katsuwonus pelamis*) dans l'Atlantique tropical est-état des stocks au 31 décembre 1978 – R. Pianet.

119 Korean research and fishing activities for tuna and tuna-like fishes in the Atlantic Ocean in 1978.

120 Informe nacional de las pesquerías cubanas de túnidos en el Atlántico durante el año 1979 – B. García Moreno.

Appendix 3 to Annex 7

REPORT OF THE SUB-COMMITTEE ON SKIPJACK

The Sub-Committee on Skipjack met on November 10, at the Hotel Castellana, Madrid, under the convenership of Dr. G. T. Sakagawa (U.S.A.). Dr. P. E. K. Symons (Secretariat) was appointed Rapporteur.

The Convener reviewed the reasons for the formation of the Sub-Committee, and the objectives of the Skipjack Year Program. He noted the accomplishments since adoption of the plans and budget at the SCRS meeting in 1978, reminding the Sub-Committee that the plans and budget for each forthcoming year of the Program must be similarly reviewed and adopted at the November meeting preceding the commencement of each year. Accomplishments in 1979 included the formation of nine "Activity Teams" charged with formulating the plans for the nine program activities, the recruitment of Dr. Symons to the Secretariat staff as Coordinator of the Program, and the convening of a meeting of the Sub-Committee in Las Palmas, Canary Islands, in July at which planning of activities was completed.

The Convener briefly reviewed the contents of COM-SCRS/79/24, the Report of the Sub-Committee meeting in Las Palmas. After incorporating editorial and other minor corrections to be received by the Coordinatior by December 1, 1979, this document will become the Skipjack Year Program's basic plan.

It contains the revised Skipjack Budget and detailed plans for all Program activities. The Convener noted that contributions of materials and personnel from countries participating in the Program were still inadequate for certain aspects of Tagging (sonic tagging), Biochemical Stock Identification, and Exploratory Fishing Activities.

The Sub-Committee was informed that because of depletion of the Secretariat's working capital funds and because of the delay in receiving country contributions to the Skipjack Budget the Secretariat might be unable to order or purchase items needed for the Program until March, 1980. Because some of these items (tags, reward posters) are needed in early 1980, this delay could mar the success of some activities.

Since the task of drawing up Activity Plans has been completed, the Convener dissolved the activity teams responsible for this work, thanking the team members for their efforts and ideas. He reappointed team leaders who will continue to be needed to instigate and coordinate Program activities through the coming years of the Program. The team leaders, and the activity team for which each is responsible, are listed in Addendum 1.

Dr. R. Kearney, South Pacific Commission (SPC), reviewed the skipjack research program that he is directing for the SPC. He noted that the SPC has so far tagged more than 80,000 skipjack tuna from a chartered baitboat and mentioned an interest in co-operating with the ICCAT Skipjack Year Program.

The Sub-Committee noted that inter-sessional meetings would benefit the planning and conduct of the Program, particularly if these could be held in the spring. A meeting was, therefore, suggested for the spring of 1980, 1981 and 1982. A final meeting for presentation of the Program is being planned for 1983.

Addendum 1 to Appendix 3 to Annex 7

Activity	*Team Leader**
1. Tagging	F. X. Bard
2. Improved Fishery Statistics	S. Kume
3. Fishery Oceanography	J. Merle
4. Maturity-Facundity	P. Cayré
5. Biochemical Stock Identification	G. Sharp
6. Ageing	L. Antoine
7. Predator Stomach Analysis	to be appointed
8. Larval Survey	Y. Matsuura
9. Exploratory Fishing	to be appointed

* As of November, 1979.

Appendix 4 to Annex 7

REPORT OF THE SUB-COMMITTEE ON STATISTICS

1. Opening of the meeting

The meeting was opened on November 10, 1979, by the Convener, Mr. S. Kume (Japan). He considered that the progress made in collecting and completing the statistics for Atlantic tunas has been considerable though there are still some difficult problems which must be solved.

2. Adoption of Agenda and arrangements for the meeting

The Agenda (Addendum 1) was adopted without change and Dr. P. M. Miyake (Secretariat) was appointed rapporteur.

3. Examination of progress made by national offices (Tables 1, 2, 3 and 4)

Each country's progress in reporting statistics through 1978 and 1979 was reviewed by the Committee. The Secretariat Report on Statistics and Coordination of Research (COM-SCRS/79/22) was also reviewed in respect to the progress made. Tables 1 through 4 were studied and updated. Those updated tables are attached to this report.

There are some new developments which need special attention and these are as follows:

FISM – All the logbook information was recompiled for years 1969-1978. In past statistics, the bigeye catches were included in the yellowfin catches, and these are now separated as far as they are recorded separately in the logbooks. Besides, past Task I data for FISM were by year of landing while new data were compiled by year of catch. Consequently, Task I nominal catches and Task II catch and effort statistics have both been corrected.

GHANA – Besides the biological port sampling of tropical species landed in Tema, Ghanaian scientists participated in several cruises carried out by various baitboats based in Tema in 1978 and 1979. The catch data were collected on a school basis and many field observations were made. Reporting of discards is obligational for all baitboats and extracts of discard information were made available.

SPAIN – All 1978 tropical tuna data (logbook summary and biological data) were processed by computer by the I.E.O. and presented to the Secretariat in early October. The programs used by the CRO for FISM data were adopted for the processing of these Spanish data.

U.S.S.R. – All the size frequency data collected from U.S.S.R. fleets in the past were made available in September. These data cover 1965 through 1978.

4. Examination of the problems of the quality of statistics and promptness of reporting

4.1. NATIONAL PROBLEMS

and

4.2. ORGANIZATIONAL PROBLEMS

These two Agenda items were discussed together. Attention of the Sub-Committee was drawn to Table 5 of the Secretariat Report on Statistics and Coordinaion of Research (SCRS/79/22) which shows the evaluation of the completeness of tasks by the national offices and Table 2 of the Bluefin Workshop Report (SCRS/79/25).

Since the Bluefin Workshop was held specifically to review the data base for bluefin tuna and comprehensive studies were made on the adequacy and/or shortcomings of bluefin statistics, the Sub-Committee did not look further into the problem, but concurred with the recommendations made by the Workshop concerning the improvement of statistics. The Sub-Committee considered that the most urgent task among all the recommendations made by the Workshop is the necessity of accurate bluefin catch figures by the Italian purse seine fisheries duly broken down by large-sized fish and small-sized fish in the Tyrrhenian and Adriatic Seas of longline catch information from countries other than Japan.

It was also recognized that major improvements were made on Mediterranean bluefin catch statistics, but that more efforts are still needed to upgrade these statistics.

For the other species, particularly for the tropical species, the Sub-Committee expressed its concern over the delay in reporting experienced this year by the FISM and Spanish fleets. Since the catches of these two fleets comprise a major part of the catches of the tropical species, the scientists involved cannot make any meaningful analyses until a later date. On the other almd, the Sub-Committee recognized that the delay was due to very specific circumstances this year, since a completely new procedure was adopted for FISM statistics in 1979 and involved recompilation of all logbook information for all past years. Also the ADP system was adopted by the I.E.O. for the first time for Task II information of the Spanish tropical fleet. Therefore, the Sub-Committee hoped that in the future, the deadline for submitting statistics will be strictly observed by all scientists.

The Sub-Committee commended those scientists who were responsible for improvements this year. The Sub-Committee noted that occasionally some essential data contained in scientific reports presented to the SCRS are not entered in the data base. The Assistant Executive Secretary explained that even though the staff scans all the papers in an attempt to pick up the new data, sometimes some data are missed. The Committee recommended that national offices resubmit those data in the agreed ICCAT format even if they have appeared in a paper.

4.3. Specific problems which have not been resolved for several years

a) Spanish tropical tuna fleet statistics (particularly Task II catch and effort data)

In the past, low and biased coverage logbook data for the Spanish tropical fleet has been one of the major problems (6 percent, 5 percent, 14 percent, 14 percent for yellowfin for 1974, 1975, 1976 and 1977, respectively; 2 percent, 4 percent, 32 percent and 30 percent for skipjack for the same years). In 1978, there was a 22 percent coverage rate for yellowfin and a 36 percent coverage rate for skipjack. Since the catches of the Spanish fleet represent a very significant portion of the total catches of these two species, it is strongly recommended that the coverage rate of logbook information be increased.

b) Discrepancies in the data bases of various laboratories

The Sub-Committee noted that the Secretariat made some studies on the East-West separation of yellowfin catches and the North-South separation of albacore catches (SCRS/79/14 and 15). Unfortunately, considerable discrepancies still exist in the North-South estimates of albacore catches for the Taiwanese longline fleets. The discrepancies are between data obtained from the ICCAT port sampling and those from Taiwan University's logbook summary. The Sub-Committee recommended that the ICCAT port sampling system be modified to cover those ports at which tuna landings by longliners have increased recently (e.g. ports in Uruguay and Venezuela). Such a modification would also result in a much higher over-all coverage rate of logbook information.

On the other hand, the Sub-Committee noted that the major discrepancies which had existed in the bluefin Task I catch data were mostly resolved while those in the Task II catch and effort and biological data bases are being resolved at the present time.

c) Problem of species misidentification

Species misidentification and misreporting of catches by species were two of the major items discussed at the Working Group on Juvenile Tropical Tunas (COM-SCRS/79/26). The Sub-Committee recognized that some new estimates of species composition of catches by tropical surface fleets were made by the Working Group. In this respect, the field observations and sampling carried out by Ghanaian scientists provided very valuable information for use in making better estimates of the bigeye-yellowfin composition of catches. The Sub-Committee agreed with the recommendation made by the Working Group that this type of survey be continued and expanded to other fleets. The recommendation that bigeye-yellowfin composition be estimated for the Spanish seiners for past years was also stressed by the Sub-Committee.

Little improvement was observed in reporting billfish catches by species. The Sub-Committee recommended that the catches of sailfish and shortbill spearfish be reported separately for all longline fleets and that the Cuban longline billfish catch be reported by species.

d) Discard statistics

For the first time, discards of under-sized yellowfin caught by Tema-based fleets were estimated by the Working Group (COM-SCRS/79/26). The discards recorded from logbooks provided by the Japanese and Ghanaian scientists were very valuable contributions. The Sub-Committee recognized that a considerable amount of small-sized fish had been removed from the stock but were not recorded as catches (or as landings). Since this is an important component to be taken into account for any population analysis, the study of estimation of discards should be continued and expanded for Korean and Panamanian baitboat vessels.

e) Monitoring of development of tuna fisheries off the African coast

The Sub-Committee recognized that the Secretariat was not able to monitor those fisheries with the present staff and work load. However, it is recommended that the Secretariat continue trying to monitor these fisheries in conjunction with other duties, such as the Skipjack Year Program, Port Sampling Program, etc. At the same time, the cooperation of national scientists is expected in getting information from the new area.

f) Improvements in statistics from the artisan fisheries

This is still a major problem, although some improvements were observed for the Mediterranean artisan fishery statistics and Ghanaian statstics.

g) Various recommendations which appear in the SCRS species section (see Item 12)

The Sub-Committee reviewed various recommendations made by the SCRS in its species section (Item 12) and pointed out two particularly important recommendations here. Those are (1) to improve the coverage rate of catch and effort statistics for Korean baitboats; and (2) to adopt "days fishing" as the effort unit for Japanese baitboat data, rather than "days with catches" as is presently used.

5. Common data base examined by Bluefin & Juvenile Tropical Tunas Working Groups

A Bluefin Workshop and a meeting of the Working Group on Juvenile Tropical Tunas were held during 1979 in order to review the basic data base with respect to eliminating all discrepancies among the data sources. The Sub-Committee reviewed these results (COM-SCRS/79/25 and 26) and found that many of the pending problems were solved or at least serious consideration is being given to them. (See Sections 3 and 4.3 of this report for details.)

6. Examination of progress made by the Secretariat

6.1. DATA BANK

a) Objectives

The Assistant Executive Secretary presented a report detailing the Secretariat's achievements in this respect (SCRS/79/16).

The Convener of the Working Group on Data Management (R. H. Pianet) presented the results of the Group's discussion (Appendix 6 to SCRS Report). He identified the needs which the national scientists will require of the Secretariat regarding data bases. He noted that the "Data Record", with slight modifications, would meet most of the needs expressed by the scientists. Mr. Pianet's group noted that the data bases are being used satisfactorily in data preparation for working groups, etc. The Convener then referred to the criteria for doing data processing at the Commission's expense. Finally, he believed that the cost-effective studies carried out by the Secretariat in 1978 (SCRS/78/17) are still valid and that if the current level of work is to be carried out, the present system would be satisfactory. However, depending on the reply from the Skipjack Year Program concerning their needs for computer processing to be done by the Secretariat, some other type of data management system might be needed.

The Sub-Committee concurred with all these recommendations made by the Working Group.

b) Updating of the data bases

The Assistant Executive Secretary presented the report on the work done by the Secretariat using the ICCAT data management system and data bases (COM-SCRS/79/22, SCRS/79/13). The Sub-Committee noted that updating of the data bases and files is now complete up to the present, except for the tagging file and bluefin Task II catch and effort and biological files. The Sub-Committee congratulated the Secretariat for a job well done.

The Sub-Committee recognized that the updating of the ICCAT data bases could be achieved much more economically and with a minimum of delay if the data are presented on magnetic tape with the following specifications: 800 bpi (if not possible, 1600 bpi), ASCII (preferable) or EBCDIC files, in characters, unlabeled. The Sub-Committee recommended that whenever possible the data (especially if they are bulky) be sent to the ICCAT on magnetic tape with such specifications.

On the other hand, the Sub-Committee also noted that the Secretariat can enter rather quickly the data which are manually prepared if presented on ICCAT forms.

c) Review of reporting

The Assistant Executive Secretary explained the reporting made by the Secretariat using the ICCAT common data base (COM-SCRS/79/22 and SCRS/79/13). The amount of work done was very impressive.

Three categories of reporting were recognized:

i) Routine compilation of national statistics

ii) Routine compilation of Secretariat statistics

iii) Special compilation of data using ICCAT data bases

As categories i) and ii) are closely related to Agenda Items 6.2 and 6.3, it was decided to discuss them under those items.

Category iii)-type work, on the other hand, was executed for the first time in 1979. It includes some of the studies the Secretariat made by itself concerning area division of yellowfin and albacore catches, all the data compilation prepared for the Working Group on Juvenile Tropical Tunas, and data prepared for the Bluefin Workshop. The Sub-Committee expressed its satisfaction that the data bases had proven useful and expected that future use of the bases would increase.

d) Review of data exchange

The Assistant Executive Secretary pointed out that the Secretariat is now providing catalogues of all the data in the ICCAT common data bases and files. These are found in the Data Record. New data entered since the last catalogue was issued were marked with an asterisk. The Sub-Committee noted that such a catalogue would assist scientists in exchanging data directly and through the Secretariat. It was recommended that this procedure be continued in the future.

On the other hand, the Assistant Executive Secretary pointed out that some delay in the exchange of data has been experienced, since all the data received by the Secretariat have to be first entered into the ICCAT data base before making them available to other scientists. This problem is a very common one throughout the world whenever an automated data processing system is adopted.

In order to overcome this difficulty, it was recommended that the national scientists make tape or hard copies available to the pertinent scientists of other national offices at the same time as they present the data to the Secretariat. This has already been practiced in part by FISM, Japanese and U.S. scientists.

6.2. COMPILATION AND PUBLICATION OF THE DATA PROVIDED BY THE NATIONAL OFFICES

The Assistant Executive Secretary reported that three volumes of the Data Record were issued in 1979. They contain all Task II catch and effort and biological data presented by the national scientists. These volumes (12, 13 and 14) were prepared in the new format adopted at the 1978 SCRS Meeting.

The Sub-Committee reviewed those volumes and found that the presentation is satisfactory, now that all the data are in the same comparative format of computer print-out. Table 2, which summarizes the catch and effort data in the same time-area strata as the size frequency data are compiled, is very handy to use. The Sub-Committee commended the work done by the Secretariat and recommended that the same format be used in future Data Record series.

The Sub-Committee also reviewed the Statistical Bulletin which summarizes all the Task I data. It was pointed out that up to now the Statistical Bulletin has served as a good data basis for scientific analysis. However, in the last two years, it has proved inadequate to meet the analytical demands of some species. In other words, the scientists had to revise the figures to make more scientifically accurate estimates. The situation was corrected for bluefin statistics, since the data base agreed upon by the Bluefin Workshop is now used for the Statistical Bulletin. In the past, the policy used for editing the Statistical Bulletin was to compile the best scientific estimates, and the Committee recommended that the Secretariat update the Task I data base following this guideline.

A proposal was made to issue a special volume of the Statistical Bulletin covering decades prior to the period appearing in the present issues of the Bulletin (i.e. 1960-1970, etc.). The Secretariat explained that this type of work was already done for the Bluefin Workshop and could easily be done for all the species, with a relatively low processing cost. The printing and mailing of such a volume would be more of a problem. The Sub-Committee, nevertheless, felt that such a volume would ve bery useful and recommended that the Secretariat prepare the issue. In case there are insufficient funds available for printing, probably the first edition of the regular Statistical Bulletin could be prepared in a less formal format.

6.3. COLLECTION AND PUBLICATION OF THE DATA PROVIDED BY THE SECRETARIAT

The port sampling program was reviewed and it was noted that this project is still providing a lot of valuable information. At the same time as the program gives direct information from the fleets sampled, it also gives the Secretariat an opportunity to monitor the total Atlantic fisheries development. There have been many improvements on Taiwanese and Korean statistics. However, there are still some discrepancies between logbook summaries by Taiwan University and ICCAT port sampling program concerning temporal and geographical distribution of catch and effort. It was also noted that the expense of maintaining such a system is rapidly increasing. However, the Sub-Committee considered that the program has been and still is providing very valuable catch and effort data and biological data on these fisheries and that eliminating the program would hamper the SCRS's studies to a great extent. The Sub-Committee recommended that the program be continued with some modifications (see 4.3.b) and that the SCRS request sufficient funds for it.

The Assistant Executive Secretary commented that the publication of these port sampling results has been delayed more as the longline trips have been getting longer each year. However, the data preparation and compilation were done very rapidly this year. The Ghanaian scientists again provided new data from their field sampling and the Secretariat compiled them in the Statistical Series. The Sub-Committee considered these data very valuable, particularly in light of the juvenile tropical tuna problem, and efforts by Ghanaian scientists and the Secretariat were much appreciated.

This year, catch and effort data by 1^{o} x 1^{o} and by month were extracted by the Secretariat for all the Tema-based fleets using Ghanaian biological sampling sheets. It was found that this type of information was very valuable as Task II catch and effort

data were not available for a major part of this fleet and the Sub-Committee recommended that this work be extended to previous years and continued in the future.

The data that the Secretariat specially compiled for the use of the working groups, etc., were not published. The Sub-Committee recommended that these data be made available only by request of members of the working groups and that publication and general distribution were unnecessary.

6.4. BIOSTATISTICIAN'S WORK

In 1979 the biostatistician participated in the following statistical work (COM-SCRS/79/22):

i) Improvement of bluefin statistics

ii) Preparation of compendium of bluefin fishery descriptions

iii) Estimation of E-W, N-S catches of yellowfin and albacore, respectively (SCRS/79/15, 16)

iv) Preparation of creating tagging files

The Sub-Committee found many improvements in the bluefin statistics and recommended that this work be continued.

6.5. OTHER MATTERS

The Assistant Executive Secretary introduced SCRS/79/5 and 17, which proposed the adoption of three-letter species identifiers. Since those identifiers have already been used in several international agencies' publications, including the FAO Statistical Bulletin, and since they are adjusted as close as possible to the ICCAT present system, the Sub-Committee recommended that these identifiers as proposed be adopted for ICCAT statistical publications (Addendum 2). The change should be made gradually so that the ICCAT statistical work would not be delayed by such a change.

7. Problems of quick compilation and dissemination of statistics

Table 4 summarizes the reporting of quick estimates of 1979 catches as of November. The estimates were only for the first six months. In 1978, the Sub-Committee recommended that each country send the catch estimates of the first six months and nine months of the year and projected estimates of annual catches for each fishery made by the national offices based on data of the former period. The process of making such projections should also be documented. The Sub-Committee noted that this recommendation has not been realized and the Sub-Committee reconfirmed the need for fulfilling this recommendation.

8. Future plans to improve the statistics and recommendations to the SCRS

There were many recommendations made by the Sub-Committee under each Agenda item and they are equally important. However, the major recommendations involve the national offices and the Secretariat and are repeated below:

a) Italian bluefin catch should be separated by fisheries and longline catch other than Japanese in the Mediterranean should be reported. (4.1)

b) More effort should be given to improvements of Mediterranean bluefin statistics. (4.1)

c) The deadline for reporting statistics should be strictly observed. (4.1)

d) Data coverage for Spanish tropical fleets and Korean baitboat fleets should be increased to eliminate biased sampling. Also Japanese baitboat statistics should be reported in better effort units. (4.3.a, 4.3.g)

e) All new data or corrections of data reported in SCRS scientific papers should also be reported on standard ICCAT statistical forms. (4.1. and 4.2)

f) Shortbill spearfish and sailfish catches should be reported separately for longline fleet and Cuban longline billfish catch should be separated by species.

g) The ICCAT port sampling should be continued, but the scheme should be adjusted to eliminate undersampling in the southern hemisphere while Taiwanese logbook coverage can be improved in the northern hemisphere. (4.3.b)

h) Field sampling for yellowfin-bigeye composition should be reinforced for all tropical surface fleets. (4.3.c)

i) Collection of discard statistics for yellowfin is encouraged. (4.3.d)

j) New development of tuna fisheries should be monitored. (4.3.e)

k) Unless the Skipjack Year Program requires a large amount of processing, the present data management system should be maintained. (6.1.a)

l) Presentation of data from national offices to the Secretariat on ICCAT-specific magnetic tapes is encouraged. (6.1.b)

m) A copy of data should be sent to pertinent scientists from the national offices when submitting data to the ICCAT. (6.1.d)

n) Issuing data catalogues in the Data Record should be continued. (6.1.d)

o) New format adopted for Data Record should be continued. (6.2)

p) The "Statistical Bulletin" should be updated with the most recent estimated catches of species agreed upon by scientists. (6.2)

q) A special issue of the "Statistical Bulletin" covering historical data should be issued after data has been checked carefully and confirmed by national scientists. (6.2)

r) Catch and effort extracts from Ghanian biological sampling sheets should be made for previous and future years. (6.3)

s) The three-letter species identifiers should be adopted. (6.5)

t) Quick estimates should include projected annual catch estimates made by the national offices. (7)

u) Secretariat should prepare, next year, Tables 2 and 3 of this report by fisheries rather than by countries and add a column to Table 2 showing data coverage.

9. Other matters

The Sub-Committee noted that ICCAT will be jointly hosting the next CWP session scheduled on July 22-29, 1980, in Madrid (SCRS/79/5) with ICSEAF. The Sub-Committee recommended that the Assistant Executive Secretary and, if feasible, a Spanish scientist attend the session on behalf of ICCAT.

10. Adoption of Report

The draft report was reviewed and adopted.

11. Adjournment

The meeting was adjourned.

Table 1. Progress made during 1979 in the collection of Task I data for 1978 (as of November, 1979)

Country	*Receipt of data*	*Catch*	*Landings*	*Effort*	*By Gear*	*By Species*	*Preliminary*	*Final*	*Remarks*
Angola	V-25 (VII-7)	x		x	x	x		x	
Argentina									
Benin									
Brazil	III-20 (III-28)	x		x	x	x	x		
Canada	III-2 (III-8)	x		x	x	x		x	
China (Taiwan)	IV-2 (III-14)		x		x	x	x		
	X-17		x	x	x	x		x	
Cuba	IV-30 (VI-8)	x		x	x	x		x	
France	III-12	x		x	x	x		x	Bluefin - Mediterranean only.
	III-12 (V-29)		x	x	x	x		x	Tropical fisheries only.
FISM	VIII-28		x		x	x		x	Includes Ivory Coast, Senegal, Morocco.
Gabon									
Ghana	VI-1 (VI-1)	x		x	x	x	x		
Greece	II-28	x					x		
Italy	V-16 (V-8)	x			x	x		x	
Ivory Coast									Included with France and Senegal.
Japan	VII-20 (III-2)	x		x	x	x		x	BB final; LL preliminary.
Korea	XI (IV-21)		x	x	x	x		x	
Libya									
Mexico									
Morocco									
Norway									
Portugal	X	x			x	x		x	
Senegal									Included with France and Ivory Coast.
South Africa	III-16 (V-3)	x		x	x	x		x	
Spain	VI-4	x		x	x	x		x	Canary Islands only.
	X	x		x	x	x		x	
Turkey									
U.S.A.	III-9 (III-9)	x	x	x	x	x	x		
	VII (VII)	x	x	x	x	x		x	
U.S.S.R.	VII-14	x	x	x	x	x		x	

NOTE: Date in parenthesis indicates when data were received in 1978.

Table 2. Progress made in the collection of Task II catch and effort data during 1979 (as of November, 1979)

Country	*Date received*	*Species*	*Gear*	*Area*	*Time*	*Effort*	*Weight*	*No. fish*	*Years*	*Remarks*
Angola	VIII-30	All	BB	5° x 5°	month	x	x		1978	Final.
Benin										
Brazil										
Canada	III-2 (III-8)	BF	PS, Sport	1° x 1°	month	x	x		1978	
	V-9 (III-8)	All	Trap	1° x 1°	month	x	x		1978	
China (Taiwan)*	X	All	LL	5° x 5°	month	x	x	x	1978	
Cuba	IV-30 (VI-8)	All	LL	5° x 5°	month	x		x	1978	
France	III-12	BF	PS, Uncl.	General	month	x	x		1978	Mediterranean.
	VIII-16 (VII-17)	Alb	Troll	1° x 1°	month	x		x	1978	
Gabon										
Ghana	VI-1 (VI-1)	All	BB	1° x 1°	month	x	x		1978	
FIS										
Japan	VII-20	All	BB	1° x 1°	month	x	x		1978	
	IX-11	All	LL	5° x 5°	quarter	x		x	1978	Preliminary.
Korea*	VIII-27 (VIII-23)	All	LL, BB	5° x 5°	month & summarized	x	x		1978	Final.
Morocco	V-14 (IV-17)	Various	Surf	1° x 1°	month		x		1978	
Portugal	X	All	Surf			x	x		1978	
South Africa	III-16 (V-3)	Various	SP, PS	1° x 1°	month	x	x		1978	
Spain	X	YF, SJ,	All	1° x 1°	month	x	x		1978	
U.S.A.	III-9 (VII-4)	Major	PS	1° x 1°	month	x	x		1978	Preliminary.
	VII-14	"	"	1° x 1° (5° x 5°)	month		x		1978	Final.
U.S.S.R.	VIII-9 (IX-14)	All	All	FAO areas	month	x	x		1978	
Venezuela										

NOTE: Date in parentheses indicates when data were received in 1978.

*1978 data from the Secretariat Port Sampling Program are also available in Statistical Series-7.

Table 3. Progress made in the collection of biological data during 1979 (as of November, 1979)

Country	*Date received*	*Species*	*Gear*	*Area*	*Time*	*Year*	*Remarks*
Angola	VIII-30	All	BB	ICCAT	month	1978	
Benin							
Brazil							
Canada	II-15 (IV)	YF,SJ,BF	PS	Specific	month	1978	
China (Taiwan)		YF,BE,Alb	LL	ICCAT	quarter	1978	ICCAT Port Sampling Program.
Cuba	IV-30	SJ	Various	ICCAT	quarter	1978	
France	III-12	BF	PS	General	month	1978	Mediterranean.
FIS							
Gabon							
Ghana	VI-1	YF,SJ,BE	BB	1° x 1°	month	1978	Compiled by ICCAT Sec. Stat. Series-8.
Japan	VII-20	All	LL	10° x 20°	month, qtr.	1977-78	
			BB	5° x 5° or 5° x 10°		1977-78	
Korea	VIII-27 (VI-26)	All	LL,BB	ICCAT	quarter	1978	
		YF,BE,Alb	LL	ICCAT	quarter	1978	ICCAT Port Sampling Program
Morocco							
Portugal							
South Africa	III-16 (V-3)	YF, SJ	PS	1° x 1°	month	1978	
Spain	X	All	PS	5° x 10°	month	1978	
U.S.A.	III-9 (III-2)	Major	PS	ICCAT	month	1978	Preliminary.
	III-9 (VII-4)	All	PS,BB,LL	Regions	quarter	1978	Preliminary.
	III-9 (III-30)	BF	Various	No area	various	1978	Preliminary.
	VII-13	All	Various	ICCAT	quarter	1978	Final.
U.S.S.R.	VIII-9	BE,YF	LL	ICCAT	quarter	65-78	
Venezuela							

NOTE: Date in parentheses indicates when data were received in 1978.

Table 4. Progress made in the collection of data for the first 6 months of 1979 (as of November, 1979)

	Total Catch (Task I)	*Catch & Effort (Task II)*	*Biological Data (Task II)*
Angola	BB		
Benin			
Brazil		Foreign-based LL	
Canada		----------Reported nil catch----------	
China (Taiwan)	LL		
Cuba	All		
France (temp.)	PS (Med.), Trol, BB		
FISM*	All		
Gabon			
Ghana			
Japan	BB,LL		
Korea-Panama	LL**		
Morocco			
Portugal			
South Africa	BB, PS, Sport, LL		
Spain	BB (Canary Islands)		
U.S.A.	Hand, PS, Sport		
U.S.S.R.			

*FISM - Tropical fleet of France, Ivory Coast, Senegal and Morocco.
**ICCAT Port Sampling Program and also Government statistics.

Addendum 1 to Appendix 4 to Annex 7

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
   - 4.1. National problems
   - 4.2. Organizational problems
   - 4.3. Specific problems which have not been resolved for several years
5. Common data base examined by the Bluefin and Juvenile Tropical Tuna Working Groups
6. Examination of progress made by the Secretariat
   - 6.1. Data Bank
     - a) Objectives (review of the report of the Working Group on Data Management)
     - b) Updating of data base
     - c) Review of reporting
     - d) Review of data exchange
   - 6.2. Compilation and publication of the data provided by the national offices
   - 6.3. Collection and publication of the data provided by the Secretariat
   - 6.4. Biostatistician's work
   - 6.5. Other matters
7. Problems of quick compilation and dissemination of statistics
8. Future plans to improve the statistics and recommendations to the SCRS
9. Other matters
10. Adoption of Report
11. Adjournment

Scientific name	*English*	*Français*	*Español*	*Code Alphanum.*	*Num.*	*Proposed intnl. 3-letter identifiers*
Thunnus thynnus t.	Bluefin tuna	Thon rouge	Atún	BF	1	BFT
Thunnus maccoyii	Southern bluefin tuna	Thon rouge du sud	Atún del sur	SBF	2	SBF
Thunnus albacares	Yellowfin tuna	Albacore	Rabil	YF	3	YFT
Thunnus alalunga	Albacore	Germon	Atún blanco	ALB	4	ALB
Thunnus obesus	Bigeye tuna	Thon obèse	Patudo	BE	5	BET
Thunnus atlanticus	Blackfin tuna	Thon à nageoires noires	Atún aleta negra	BLF	6	BLF
Euthynnus alletteratus	Atlantic little tuna	Thonine	Bacoreta	LT	7	LTA
Katsuwonus pelamis	Skipjack	Listao	Listado	SJ	8	SKJ
Sarda sarda	Atlantic bonito	Bonite à dos rayé	Bonito	BON	9	BON
Auxis thazard	Frigate tuna	Auxide	Melva	FRT	10	FRI
Orcynopsis unicolor	Plain bonito	Palomette	Tasarte	PBON	11	BOP
Acanthocybium solandri	Wahoo	Thazard bâtard	Peto	WAH	12	WAH
Scomberomorus maculatus	Spotted Spanish mackerel	Maquereau espagnol	Carita	SPM	13	SSM
Scomberomorus cavalla	King mackerel	Thazard	Carita	KM	14	KGM
Istiophorus albicans	Atlantic sailfish	Voilier	Pez vela	SAIL	15	SAI
Makaira indica	Black marlin	Makaire noir	Aguja negra	BLM	16	BLM
Makaira nigericans	Atlantic blue marlin	Makaire bleu	Aguja azul	BM	17	BUM
Tetrapturus albidus	Atlantic white marlin	Makaire blanc	Aguja blanca	WM	18	WHM
Xiphias gladius	Broadbill swordfish	Espadon	Pez espada	SF	19	SWO
——	Others + mixed spec. + unknown	Autres + espèces mélangées + inconnues	Otros + mezcla especies + desconocidos	OTH	21	OTH
Tetrapturus pfluegeri + *T. bolone*	Spearfish	——	——	SPF	20	SPF
——	Young tunas			YOUN	23	YOU
——	Billfishes	Xiphiidés	Marlines	BILL	24	BIL
——	Small tunas unclassified			SMAT	25	SMT
——	Big tunas unclassified			BIGT	22	BGT
Scomberomorus spp.	Scomberomorus unclassified			SCOM	26	KGX
Allothunnus fallai	Slender tuna			SLT	27	SLT

Appendix 5 to Annex 7

REPORT OF THE WORKING GROUP ON DATA MANAGEMENT

The Working Group on Data Management met at the Hotel Castellana, Madrid, on November 9, 1979. The following attended the meeting: R. H. Pianet (France, Convener), A. Fonteneau (France), J. M. García Mamolar (Spain), T. D. Iles (Canada), R. J. Conser, A. L. Coan (USA), S. Kume (Japan), R. A. Skillman (U.N. South China Sea Program), V. Nordström, P. M. Miyake (Secretariat). P. M. Miyake was asked to serve as rapporteur.

Mr. Pianet reviewed the progress made by the Working Group during 1979. He defined the terms of reference as follows:

1) To determine the expected input and its volume as well as the amount of processing needed by the scientists;

2) To identify the amount of output and the level of processing expected by the Skipjack Year Program of the Secretariat;

3) To evaluate systems which best satisfy that outlined in (1) and (2) above in the most economical and efficient way.

The Group reviewed SCRS/79/16 prepared by the Secretariat on this subject. The summary of the results of the survey made by the Secretariat in early 1979 (concerning (1) above) was studied carefully. It was recognized that requests for data processing made by various countries could be categorized into the following two types:

a) Member countries which have well-developed computer facilities available. Those countries generally request that a minimum level of data compilation be done by the Secretariat and that the output be provided on magnetic tape. Thus, the centralized ICCAT data base serves mainly as a data exchange medium.

b) Member countries which do not yet have a computer system or those countries for which tuna fisheries are small. They usually request the Secretariat to compile data at a high level of processing and want the output available in publication form or in hard copies.

The Group decided to review the Commission's "Data Record" publication in which Task II catch and effort data and biological data are presently disseminated. The Group recognized that the new format adopted by the Secretariat for the Data Record series in 1979 was quite satisfactory. In reviewing the details, the following suggestions were made:

1) Table 1 - Detailed catch and effort data - The coverage rate of the original data and, in cases where the data are extrapolated, the coverage rate of extrapolated data to the total fishery should be added to the table. The coverage rate can be for the entire fleet or each time-area stratum.

2) Table 2 - Summary catch and effort data - No change.

3) Table 3 - Size frequencies table - Mean weight should be added to the frequencies, decimals in the computed frequencies should be rounded to the nearest whole number and the number of records should not appear in the column of the number of samples.

4) Catalogues - A column designating revised data should be added.

With the introduction of these minimum changes, the Group felt that these tables in the Data Record would meet the needs of those countries described in paragraph b and yet would prove to be useful for those countries described in paragraph a. Therefore, the Group recommended that the newly formatted Data Record be continued as the medium to disseminate the newly received data on a routine basis.

The Group then considered the data processing which may be required of the Secretariat by the various Working Groups, etc., from time to time. This processing would most likely be the following:

1) Compilation of catch and effort data by sampling areas of different species (e.g. yellowfin data by skipjack areas or longline data by surface areas, etc.).

2) The combining of data by year, species, etc., for given areas.

3) Compilation of size frequencies by any areas (assuming that countries provide the data on a $1^{o} \times 1^{o}$ area basis).

The Group realized that such special work has already been very successfully executed by the Secretariat for the Juvenile Tropical Tuna Working Group. This work was done within the limits of the budget.

The Group then studied the criteria applied regarding payment for the processing work. The present policy is as follows:

1) Routine processing should be done at the Commission's expense.

2) Task II catch and effort and biological data should be copied on magnetic tape and provided to the countries who so request them, and these costs should also be incurred by the Commission.

3) Any extra processing work (not included in categories 1 and 2 above) should be charged to the users, unless the request for such processing comes from Working Groups or other groups authorized by the SCRS.

The Group recognized that some countries which do not have computer facilities may request processing work to be done by the Secretariat. These requests can be divided into two classes:

1) Processing of raw data up to Task II catch and effort and biological data standards.

2) Analytical processing.

The Group recommended that Type 1 processing be done by the Secretariat, at the Commission's expense. The decision regarding payment for analytical processing can be made as each situation is presented, since such requests are very rare. If such requests increase in the future, definite criteria should be established for charging for such processing.

The Group recommended that the Secretariat install the minimum required basic programs for population analyses with the system, in case a Working Group wants to make on-the-spot analyses. In this respect, the U.S. scientists reported that the present INFONET system is very efficient in data management but less efficient in analytical processing.

The Group noted that the comparative studies carried out by the Secretariat in 1978 (SCRS/78/17) are still valid, although the absolute prices have been increased by 15 to 20 percent in all the systems compared. Therefore, it seems that if the Skipjack Year Program does not require a substantial amount of processing, the processing work required of the Secretariat will remain at the present level for the next few years. Costs may be expected to increase moderately due to inflation. The present INFONET system will be able to handle the work very well.

On the other hand, if a substantial amount of processing will be required, particularly if new types of data files and scientific analyses are involved, the present system may become uneconomic. Therefore, in the latter case, economic studies should be carried out to select the best system to handle the increase in the amount of work to be done by the Secretariat.

Therefore, the Working Group requested that the Sub-Committee on Skipjack provide estimates of the volume of data processing as well as the type(s) of processing required of the Secretariat so that the Commission can act on necessities of the data processing system.

Appendix 6 to Annex 7

REPORT OF THE WORKING GROUP ON SCRS ORGANIZATION

The Working Group on SCRS Organization met at the Hotel Castellana, Madrid, on November 8, 10 and 11, 1979. The following members were nominated to serve on the Working Group: N. Bartoo (U.S., Convener), G. Sharp (FAO), R. Letaconnoux (France), J. S. Beckett (Canada), and P. M. Miyake (Secretariat). In addition, the Group was joined by several different members at one or more of its meetings.

The Working Group met specifically to explore the possibility of modifying the organizational procedure used by the SCRS in producing and reporting scientific advice to the Commission. The procedures and formats used by other Commissions for providing scientific advice were discussed.

A key concern indentified by the Group was that the SCRS Report had grown in size and complexity. This requires more time to review and adopt the final report which has had the effect of limiting discussions on the scientific issues raised in the working papers. The Group noted that the use of special working groups, such as the recent Santander Bluefin Workshop, effectively helps answer serious questions without burdening the SCRS meeting.

The use of *ad hoc* inter-sessional meetings of working groups on special, non-routine problems was endorsed by the Group. The expansion of inter-sessional meetings on a regular basis to cover items such as stock assessments is to be discouraged as it is quite difficult to get high levels of participation by all countries due to travel costs, etc.

The Group felt that some changes in SCRS organization were needed to provide additional time to review the scientific content of submitted working papers. The Group had differing opinions and no consensus was reached on what was the best way to accomplish this goal.

However, the Group drafted several changes which could produce positive results

and could be added to or modified in the future. The Group recommended:

1) That the rapporteurs' groups should function as species working groups and all interested scientists be encouraged to attend and discuss the papers. Because the chief rapporteur will be expected to lead the discussion of the working papers, it is imperative that papers be received on time, preferably by Sunday afternoon.

2) That the first day (i.e. Wednesday) of the SCRS meeting be added to the rapporteurs' species group meetings and that the reports be polished beyond the current rough draft stage.

3) That each species report be shortened to about a maximum of five pages of text (double spaced) plus figures and tables.

4) That only sections on status of stocks, current appraisal, management recommendations and referenced tables and figures be sumbitted to the Commission for its meeting, and for inclusion in the Biennial Report.

5) That the rapporteurs be given specific instructions to aid in preparing the report, such as:

a) Including but not rewriting sections which have not changed from the previous year,

b) Not elaborating on techniques, procedure, data, etc., unless it is specifically needed to evaluate the condition of the stock.

6) That the complete rapporteurs' report parts covered in (4) plus portions not submitted to the Commission, such as reports of Sub-Committees and Working Groups, current research, catch trends, etc., be included in the Collective Volume series, and not the Biennial Report.

7) That FAO-type species synopses be prepared inter-sessionally (once) for each species in the Atlantic. The documents should be distributed in looseleaf form so that updated pages might be substituted when such updating is indicated.

8) That the Working Group re-convene next year to assess the effectiveness of the changes and made further recommendations.

Appendix 7 to Annex 7

REPORT OF THE WORKING GROUP ON PUBLICATION POLICY

The Working Group on Publication Policy presented a report to the plenary session of the Standing Committee on Research and Statistics (SCRS) in 1978. The report summarized the Working Group's criteria on the possibility of improving the quality and presentation of the Collective Volume of Scientific Papers (red book). The report was not approved by the Committee.

The Working Group continued its work through correspondence. In this way and by taking into account suggestions by some national correspondents and delegates attending the 1978 meeting, the Group concluded that the "red book" series should be

maintained since it serves as a useful and rapid means by which the scientific information presented at ICCAT meetings is made readily available to interested scientists. On the other hand, the presentation of the series should be improved in order that usage of the book can be facilitated. Besides, it was pointed out that any improvements made should not increase the cost of the publication. This can be accomplished by standardizing all the original papers which are to be published. Also, the authors who wish to have their papers included in the series should be requested to send a sufficient number of copies to the Secretariat to eliminate the Secretariat's having to reproduce them. In this way, the expenses of the publication would be limited to binding, paging, and preparation of the indices.

No scientific paper presented to the SCRS should be excluded from the Collective Volume, unless so requested by the author or because the paper does not meet editorial standards. However, the national reports are not to be included in the series, since they are included in the Biennial Report.

Since the Collective Volume is an informal publication it is desirable that the Commission prepare a "formal" publication which contains the best papers presented at the annual meetings and other original works of scientific interest and which are prepared especially for this publication. Selection of papers would be carried out by an Editorial Committee, which would include a member of the Secretariat staff. The Committee would also conduct a cost study of the publication.

Formats to be followed in the preparation of originals for inclusion in the "red book" or a possible new publication will be distributed to the authors.

CHAPTER III
National Reports

CANADIAN NATIONAL REPORT, 1978-79

by

T. D. ILES, P. C. F. HURLEY and C. D. BURNETT

1. Status of the fisheries

1.1 Swordfish

The nominal catch of swordfish in Canada for 1978 amounted to 2,314 MT. Most of this was transshipped to American boats and sold on American markets.

1.2 Tunas

In 1978 Canadian landings of bluefin tuna by all methods in the western Atlantic yielded 670 MT (round weight), a 31 percent decrease from the previous year's total of 972 MT. The purse seine fishery for juveniles off the eastern coast of the United States accounted for 241 MT; the mackerel trap fishery in St. Margaret's Bay, Nova Scotia, took 221 MT of giant bluefin while the remaining, also of giants, 208 MT were taken in the sport (rod-and-reel) fishery.

There was no Canadian purse seine fishery for yellowfin or skipjack in the Gulf of Guinea in 1978 but Canadian boats landed 318 MT of yellowfin and 86 MT of skipjack from the western Atlantic.

The regulations for the 1978 giant bluefin tuna fisheries remained the same except for a minor change in fishing seasons.

2. Special research studies

2.1 Swordfish

No experimental cruises were conducted for swordfish in 1978.

Original report in English.

Two tagged swordfish were recaptured in 1978. One was captured by harpoon and released in 1970; the other by longline in 1975. Both were recaptured in the same general area of the tagging site after 2,965 and 1,071 days at large, respectively.

2.2 Tunas

Weights were recorded for 1,032 giant bluefin tuna caught in Canadian waters in 1978, about 90 percent of all fish caught. In the Gulf of St. Lawrence area the mean weight of 483 fish was 408 kg, an increase of 3 percent over 1977. The Bay of Chaleur catch decreased considerably, dropping from 205 fish in 1977 to 46 in 1978.

The trap fishery in St. Margaret's Bay, Nova Scotia, also decreased, dropping from 948 fish in 1977 to 530 fish in 1978. Four hundred and sixty bluefin were impounded successfully for fattening for one to four months while the remaining 70 fish were landed immediately upon capture in the traps and not impounded. Mean weights for these two groups of fish were 431.2 kg and 327.9 kg, respectively. This suggests about a 30 percent increase in condition and demonstrates the rationale behind the impounding procedure.

One impoundment containing ten bluefin was made available for research purposes. Canadian and American scientists conducted cooperative investigations of: monitoring behavioural and physiological parameters by means of ultrasonic telemetry, ageing validation, tag retention, tissue contamination, parasitology and electrophoretic studies.

Detailed morphometric measurements were collected from 596 giant bluefin caught at various locations in Canadian waters in 1978. Otoliths, together with weight, length and sex, were collected from 272 of these fish as part of a growth study.

Catches of small bluefin made by purse-seine vessels in July and August off the mid-Atlantic coast of the United States were sampled for length composition. Fork length ranged from 55.3 to 186.8 cm, with an average length of 111.9 cm. From this fishery, 50 otoliths were collected for age determination.

Six bluefin were tagged and released in 1978. Five were released from traps in St. Margaret's Bay, N.S., and one from a rod-and-reel capture east of Halifax, N.S.

Four bluefin were recovered in 1978. Three had been tagged and released from traps in St. Margaret's Bay, N.S., in 1975 and 1976; two of these were recaptured by rod-and-reel in the Prince Edward Island area and the other by a Japanese longline in the Gulf of Mexico. The fourth recovery was released in the Bay of Chaleur area and recaptured in the same general area.

3. Preliminary information for 1979

There has been no Canadian catch of school tuna in the Atlantic in 1979 since no Canadian tuna purse-seine vessels operated in this area. The five Canadian tuna purse seiners changed registry in early 1979 and have fished exclusively in the Pacific.

Preliminary catch figures for the giant bluefin fisheries in Canadian waters indicate that there has been a substantial reduction in both the incidental-trap catch in St. Margaret's Bay and the sport catch. Only 92 bluefin were caught in the trap fishery compared to 530 bluefin landed in 1978 and 1,048 landed in 1977. Preliminary figures show that the Prince Edward Island catch has dropped to about 343 fish from 437 in 1978. Although the Bay of Chaleur catch has risen to approximately 96 fish, compared to 47 in

1978, this is still substantially lower than the catches of 1976 and 1977. It is thought possible that anomalous local hydrographic conditions are responsible for the low St. Margaret's Bay catches and a study is currently attempting to determine if this is the case.

During the sport fishing season, new regulations were introduced with changes in season length and licensing procedure, that will remain in effect until the end of the year.

The Canadian swordfish fishery was re-opened in 1979 and a quota of 3,000 MT was established. Preliminary figures indicate that quota will be reached. Length and weight frequency samples have been obtained from representative catches. Comparison with similar catches prior to the 1971 closure is proceeding in an attempt to assess changes in the population status.

Three bluefin tuna were recaptured in 1979. Two of these were tagged from rod-and-reel capture in the Bay of Chaleur in 1975 and 1977, and were recaptured in the same general area. The other bluefin was tagged by rod-and-reel capture off eastern Nova Scotia in 1977 and was recaptured by rod-and-reel in April, 1979, off Ponce, Puerto Rico. This represents the first Canadian bluefin recovery from the Caribbean.

One swordfish was recaptured off Florida in 1979. This fish was tagged by harpoon in 1968 off Nova Scotia and was thus at large for 3,995 days. This is the longest reported period-at-large for a swordfish recovery.

4. Publications

BURNETT, C. D., P. C. F. HURLEY and T. D. ILES

1979 MS Report to the ICES Bluefin Tuna Working Group - Canadian Report for 1978. 8 pp.

HURLEY, P. C. F. and T. D. ILES

1979 a) A review of Canadian fisheries for large pelagic fishes. CAFSAC Working Paper 79/87. 17 pp.

1979 b) A brief description of Canadian fisheries for Atlantic bluefin tuna. Santander Bluefin Tuna Workshop, ICCAT WGBF/79/19.

1979 c) Report of the Canadian research program on large pelagic fishes. ICCAT SCRS/79/112.

HURLEY, P. C. F., G. A. P. BLACK, C. D. BURNETT and T. D. ILES

1979 Preliminary analysis of catch and effort data for the Canadian bluefin tuna rod-and-reel fishery. ICCAT SCRS/79/113.

CUBAN TUNA FISHERIES IN THE ATLANTIC IN 1979

by

B. GARCIA MORENO

1. The tuna fleet

The Cuban tuna fleet which operated in the Atlantic was comprised of 24 long-liners and 1 purse seiner. The fleet operated fundamentally in the central and eastern Atlantic, with some isolated operations in the central western Atlantic.

The Cuban flat fleet was dedicated basically to the capture of skipjack and was comprised of 74 baitboats.

2. The fishing zone

The area where the fleet operated was between 15°N latitude and 10°S latitude, and approximately from 60°W longitude to the African coasts.

3. Development of the catches

Cuban tuna catches in 1978 reached 9,200 MT, which represents a decrease of 900 MT as compared to the previous year. The species composition during the last six years is shown on the following table.

Species	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*
Bluefin	--	--	--	--	--	--
Yellowfin	4.9	3.8	2.6	3.6	3.9	3.0
Albacore	--	--	0.1	0.1	0.1	0.1
Bigeye	2.6	2.4	1.9	1.3	1.8	2.3
Skipjack	1.5	1.9	2.6	3.0	2.5	2.0
Marlins	--	2.3	1.4	0.7	0.6	0.5
Swordfish	1.0	--	--	0.6	0.7	0.6
Carita Sierra	0.7	0.6	0.6	0.5	0.4	0.6
Other species	1.1	0.3	1.0	0.4	0.1	0.1
TOTAL (in thousand MT)	11.8	11.3	10.2	10.2	10.1	9.2

Original report in Spanish.

4. Research

During 1978 monthly biological samplings were conducted in all the skipjack fishing zones. Besides, catch and effort data were compiled from all the vessels dedicated to this fishery.

REPORT OF 1978 FRENCH RESEARCH

by

H. ALONCLE[1]

1. Status of fishing in France

It is estimated that approximately 74,400 MT of tunas were caught in 1978 off the coasts of France and on the high seas.[2]

2. Development of the catches (in thousands of MT)

	1972	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*
Albacore	9.8	6.0	7.5	5.6	6.1	5.9	8.4
Yellowfin	35.6	32.3	31.5	38.0	48.0*	37.9	41.6
Skipjack	20.5	12.7	24.5	11.4	18.4	24.8	19.9
Bigeye	0.3	2.5	0.5	0.04	1.0	3.0	2.2
Bluefin	2.8	1.5	2.3	2.3	3.8	3.7	2.3
Total	69.0	55.0	66.3	57.34	77.3	75.3	74.4

(*FIS and Moroccan fleet.)

2.1 Albacore

In 1978, 8,380 MT of yellowfin were landed by 186 vessels registered at French Atlantic ports, as opposed to 167 vessels in 1977. Six hundred and fifteen trips were made.

2.2 Bluefin

In the Mediterranean, 1,556 MT of bluefin were landed by 27 purse seiners. A total of 65 successful trips were carried out, of which 30 days' fishing took place in the Gulf of Genoa and 35 in the Gulf of Lyon. It should be noted that 31 MT were caught by a gear other than purse seine.

[1] "Institut Scientifique et Technique des Pêches Maritimes," B.P. 1049 - Nantes, France.
[2] Statistics from the Merchant Marine.
Original report in French.

In the Atlantic, in the Bay of Biscay, 724 MT of bluefin were caught with live bait.

2.3 Tropical tunas (yellowfin, skipjack, bigeye)

Total catch for these species is estimated at 63,700 MT caught by 25 ice baitboats, 4 baitboats, 11 medium purse seiners and 30 large purse seiners.

3. Research carried out

3.1 ISTPM

Three research cruises for albacore were carried out in the North Atlantic.

Two cruises were carried out by the oceanographic vessel "La Pélagia," one in the area of the Açores Islands (May, June) and the other from 48°N to 20°W longitude (August).

During September-October, the oceanographic vessel "Cryos" worked in the area to the south and southeast of the Great Bank of Newfoundland. The reports of the three aforementioned cruises were published (Science et Pêche, no. 290, April, 1979).

During these cruises, albacore and bigeye tagging was carried out. Studies on albacore feeding were published (C.N.E.R.M.A.-C.N.R.S.).

In the Mediterranean, the bluefin fishery was monitored at landing ports as well as at wholesalers. 38,757 fish were sampled. This amounts to more than 30 percent of the total catch (649,257 MT). Growth studies (Petersen method, vertebrae) were carried out. The following documents were presented to the 1979 SCRS: SCRS/79/46, 47, 48, 72, 73, and 74.

3.2 ORSTOM

Research was carried out on tropical tunas. The studies are coordinated within the scope of various African countries' research programs. Therefore, they are explained in the national report of the concerned countries.

However, several studies were carried out in France, directly by ORSTOM scientists or by trainees (under the responsibility of ORSTOM). Considerable time was also dedicated to developing the Skipjack Program.

Documents presented by ORSTOM to the SCRS were: SCRS/79/51, 103, 104, 109a, 109b, 115 and 118.

3.3 CNEXO-COB

Research was carried out on bluefin and albacore, in particular, for the French, Spanish and Portuguese northeast Atlantic fisheries in collaboration with scientists from the "Instituto Español de Oceanografía."

Two types of studies were carried out. The first was updating data (breakdown of catch by age) and methods (cohort analysis, recruitment levels, yield-per-recruit, etc. leading to stock evaluation). The second, more unique study was divided between revising the basic parameter: growth by use of a new method and ageing (dorsal fin ray sections) and the completion of a new multi-cohort analysis method when catch by age and yield

(CPUE) vectors observed for two successive age classes are available.

By using the results obtained, either by updating or by new research, we tried to follow the recommendations set out by the SCRS in 1978. This was achieved by evaluating the impact of a different growth rate according to sex on the assessment of the North Atlantic albacore stock and by examining the stock-recruitment relationship of the stock. Documents presented to the SCRS were: SCRS/79/59, 60, 67, 68, 69 and 107.

4. Documents presented at the 1979 SCRS meeting

4.1 ISTPM

ALONCLE, H.

a) Rapport de recherches 1978 pour la France.

b) Campagne de prospection du germon de surface dans le N. ouest Atlantique (11 juillet-11 août).

ALONCLE, H. et F. DELAPORTE

Reprise des thonidés par l'ISTPM en Atlantique Nord (*T. alalunga, T. obesus, T. thynnus).*

FARRUGIO, H

a) Résultats de la campagne de pêche au thon rouge en Méditerranée française en 1978.

b) Age et croissance du thon rouge (*Thunnus thynnus*) dans la pêcherie française de surface en Méditerranée.

PICCINETTI, C. et H. FARRUGIO

Validité des captures de thon rouge à la senne tournante en Méditerranée, considérées comme index d'abondance.

4.2 ORSTOM

BAGES, M. et A. FONTENEAU

Prises de la flottille thonière franco-ivoiro-sénégalaise et température de surface en 1977.

COMPEAN, G. et E. YANEZ

Analisis preliminar de la pesca palangrera en el Golfo de Mexico: Japon de 1963 a 1976.

FONTENEAU, A.

Croissance de l'albacore (*Thunnus albacares*) de l'Atlantique est.

FONTENEAU, A et P. CAYRE

Analyse de l'état des stocks d'albacore (*Thunnus albacares*) et de listao (*Katsuwonus pelamis*) de l'Atlantique est au 30 septembre 1979.

PIANET, R.H.

La pêcherie de listaos (*Katsuwonus pelamis*) dans l'Atlantique tropical est, état des stock au 31 décembre 1978.

YANEZ, E.

Analyse de la prise, de l'effort et de la prise par unité d'effort "annuelle" de la pêche palangrière (1956 à 1977) et de surface (1969 à 1978) du yellowfin (*Thunnus albacares*) de l'Atlantique.

YANEZ, E. et M.A. BARBIERI, B.

Analyse de la prise par unité d'effort "saisonnière" et de l'évolution de l'indice gonado-somatique de la pêche palangrière (1956 à 1977) et de surface (1969 à 1978) du yellowfin (*Thunnus albacares*) de l'Atlantique.

4.3 CNEXO-COB

COMPEAN JIMENEZ, G. et F. X. BARD

Age and growth of East Atlantic bluefin tuna as determined by reading of fin rays cross section.

BARD, F. X. et G. COMPEAN JIMENEZ

Conséquences pour l'évaluation du taux d'exploitation du germon (*Thunnus alalunga*) Nord Atlantique d'une courbe de croissance déduite de la lecture des sections de rayons épineux.

BARD, F. X. et J. L. CORT

Evaluation of apparent recruitment of bluefin tuna in the eastern Atlantic, west of Gibraltar.

BARD, F. X. et A. GONZALEZ-GARCES

Etat du stock de germon (*Thunnus alalunga*) Nord Atlantique en 1979.

CORT, J. L. et F. X. BARD

La pesquería vasca de atún rojo (*Thunnus thynnus*) del Golfo de Vizcaya, 1966-79.

LAUREC, A. et F. X. BARD

Analyse multicohorte sur deux classes d'âge.

GHANAIAN NATIONAL REPORT – TUNA FISHERY, 1978

1. Tuna fleet

Forty-eight tuna vessels were registered in 1978, all of which, except one, operated. These comprised forty-two foreign and six Ghanaian vessels.

The Ghanaian fleet that operated consisted of the following:

Vessel	*Gear*	*GT*
Fernanda Marisa	Baitboat	282.94
Nick 'T'	"	282.99
Joy	"	253.88
No Catch No Pay	"	284.73
Mary Radine	"	283.88
Leader	"	251.90

The foreign fleet consisted of the following:

Flag	*Type*	*Number*	*Range in GT*
Japanese	Baitboat	20	253.94-379.59
Panamanian	"	11	253.00-457.11
Korean	"	10	188.84-416.95
Netherlands	"	1	245.00

In addition to the industrial tuna fleet, the Ghanaian artisanal fleet continued to catch tunas and related species in 1978.

2. Landings

The following landings in metric tons were made by the foreign and Ghanaian flag vessels during the year under review:

Original report in English.

Species	*Foreign Flag*	*Ghanaian Industrial*	*Ghanaian Artisanal*	*Total*
Yellowfin	2872.657	250.431	235.000	3358.088
Skipjack	29506.698	2635.792	206.000	32348.490
Bigeye	4104.037	181.447	3.000	4288.484
Little tuna	847.632	68.240	--	515.675
Frigate tuna	--	--	1047.000	1047.000
Others	501.536	414.336	7886.000	9837.872
TOTAL	37432.363	3550.246	9377.000	50348.609

Quarterly landings by the industrial fleet showed increases from the minimum of 7,100.339 MT in the first quarter to the maximum of 39,551.062 MT in the fourth quarter; the second and third quarter landings were 7,997.785 MT and 11,659.022 MT, respectively.

3. Research

The biennial (1977-78) research programme outlined in the 1976 Country Report was adhered to as much as possible.

Biological sampling

i) Length frequency measurements, maturity and feeding studies of the tunas were carried out in the course of the year. The species worked on were the yellowfin, bigeye and the skipjack. A total number of 5,200 yellowfin, 4,480 bigeye and 7,200 skipjack were measured during the year.

The length frequency distribution continued to demonstrate the predominance of young tunas off Ghana.

ii) Also initiated in the course of the year was a study of the biology of the young tunas involving the gonado-somatic indices and stomach contents of the juvenile tunas landed by the Ghanaian fleet which are used to feed the local cannery.

iii) In addition to port sampling, at-sea sampling of tunas was carried on with the cooperation of Star-Kist Int. Ghanaian scientists on board tuna boats fishing for Star-Kist Int. obtained valuable information including data on species composition of tuna schools, magnitudes of discards of juvenile tunas and weights of bait caught.

iv) Furthermore, the tuna fleet assisted in identifying the young yellowfin and bigeye.

Discards

The problem of discards of under-sized yellowfin at sea continued to engage the

attention of the Research and Utilization of the Fisheries Department. Forms were designed and distributed to the tuna fleet to fill in data regarding the magnitude and rate at which immature yellowfin were discarded at sea.

A total of 75 such forms were filled in during 1978. Based on these data, it is estimated that a total weight of 6,650.00 MT of juvenile yellowfin were discarded by the Tema-based foreign flag baitboats in 1978.

4. Research Programme for 1979-80

The research programme as outlined in the 1976 Country Report will continue for the next biennium but with greater emphasis on:

i) At-sea sampling to obtain information on mixing of species within schools; rates of discards of juvenile yellowfin and the catches of bait.

ii) Gonado-somatic indices and the feeding of the juvenile tunas.

iii) Improvement in Task II statistics and size frequency.

JAPANESE TUNA FISHERIES AND RESEARCH IN THE ATLANTIC, 1978-79

by

SUSUMU KUME
FAR SEAS FISHERIES RESEARCH LABORATORY

1. Fishing activities

Japanese Atlantic tuna fisheries in 1978 harvested about 39,000 MT of tunas and tuna-like fishes by two types of gears, longline and pole-and-line (Table 1). This amount represents approximately the same catch level since 1975, reflecting little recent changes in Japanese tuna fishing activities in the Atlantic (Fig. 1).

During the first half of 1979, the longline fleet operated in the same seasonal pattern and with a slight increase in the number of boats. More than two-thirds of the boats concentrated on southern bluefin fishing in the southeastern Atlantic as they did during this time period in the previous year. The Japanese pole-and-line fishery in the eastern equatorial Atlantic also continued the same level of operation in early 1979.

1.1 Longline fishery

The Japanese longline fleet has recently been exclusively based at Japan and the 1978 catch amounted to 21,800 MT (preliminary) the same as that of the preceding year. The fishery has been more intensively pursuing bigeye, bluefin and southern bluefin tunas, the combined catch of which was 18,300 MT, or 84 percent of the total longline catch (Table 3). Yellowfin, albacore and billfishes constituted only a minor portion of the longline catch. Although the number of longline boats which operated in the Atlantic increased to 216 in 1978 as compared to 179 in 1977 (Table 2), about two-thirds of these vessels operated solely in the southern bluefin fishing ground off southernmost Africa. The trip length for longliners in the Atlantic usually exceeds one year.

In the earlier half of 1979, the number of the longline vessels in the Atlantic ranged from 70 to 180 monthly, and concentration in the southern bluefin fishing ground was much more strengthened than the previous year.

Since April, 1975, the Japanese fishermen have been under governmental regulatory measures to observe the ICCAT bluefin regulations. The 1978 Atlantic bluefin tuna catch was about 3,000 MT, including Mediterranean catches, far less than that of 1977. A

Original report in English.

patrol boat was again dispatched to monitor the longline fleet for bluefin fishing in May and June of 1979.

1.2 Pole-and-line fishery

Japanese pole-and-line boats based at Tema, Ghana, numbered 19 in 1978, but the actual number of boats which operated per month was from 8 to 15. The 1978 catch amounted to 17,200 MT, about 18 percent less than that of 1977. The most predominant species in the catch was skipjack as usual, which made up about 85 percent (14,600 MT) (Table 4). The second and third important species in the catch were bigeye and yellowfin, 7 percent and 5 percent of the catch, respectively. Yellowfin discards were estimated to amount to 792 MT in 1978.

During the period from January to June, 1979, 6 to 14 Japanese Tema-based pole-and-line boats per month operated. These vessels unloaded about 7,800 MT, which exceeded by 40 percent the landings in the same period of the preceding year. Skipjack catches predominated, representing about 90 percent of the total catch.

In compliance with the yellowfin minimum size regulation that has been in effect by ICCAT since 1973, every effort has been expended by the fishermen concerned, with careful guidance by the Fishery Agency.

2. Research activities

Research work on Atlantic tunas and billfishes was routinely conducted during the period 1978 to 1979. In 1979, special research contributions were made to the International Skipjack Year Program, the Bluefin Workshop and the Working Group on Juvenile Tropical Tunas.

2.1 Fishery statistics

Annual catch statistics (Task I) were reported to the ICCAT up to the final 1978 figures for the pole-and-line fishery and the preliminary statistics for 1978 for the longline fishery. Estimated catches by species in the first half of 1979 were also made available as of September, 1979. Past longline catch data for 1971-75 were revised by excluding the catches made in the area of 20-30°E longitude, consistent with the catch and effort statistics.

Catch and effort statistics (Task II) were also routinely submitted to the ICCAT. Currently available statistics include the final 1978 pole-and-line data and very preliminary 1978 longline data. Effort data on Task II for the purse seine fishery, 1972-75, were recompiled in terms of fishing days and submitted to the Working Group on Juvenile Tropical Tunas. On several occasions, Japanese Task II statistics including past data were provided on magnetic tape to the ICCAT to facilitate the establishment of the ICCAT data bank.

Size frequency statistics (biological sampling) have been remarkably improved through a continued program for size measurement on board vessels which is carried out by the tuna fleet in the Atlantic. Length data for 1977 were compiled for tunas and billfishes and reported to the ICCAT in January, 1979, by the Far Seas Fisheries Research

Laboratory (FSFRL). In addition, provisional tabulations for 1978 size data were made available on the measurements collected up to July, 1979; these were immediately sent to the ICCAT. Since April, 1979, a new sampling scheme has been launched to measure on board the size of fish (on a school basis) caught by the pole-and-line fishery, and the data have been gathered at the FSFRL.

2.2 Tuna biology and stock assessment study

For the meeting of the Sub-Committee on Skipjack held at Las Palmas, Canary Islands, July 23-28, 1979, a Japanese scientist participated in discussions on detailed plans of various activity teams of the International Skipjack Year Program. Two scientists participated in the Bluefin Workshop held at Santander, Spain, September 3-8, 1979. They contributed to the meeting by presenting a description of the Japanese Atlantic bluefin fishery and were successful in finalizing the Japanese bluefin catch-effort data base.

To evaluate the effective efforts of the longline fishery by species, the FSFRL continued to estimate them with overall fishing intensity based on the Japanese and Taiwanese longline fisheries data for the years up to 1977. The results of studies on biology and population dynamics of the Atlantic tuna and billfish resources was presented at the 1979 SCRS meeting. A list of documents is attached to the reference section.

3. References

3.1 Documents presented at the Bluefin Workshop

SHINGU, C., K. HISADA and Z. SUZUKI

Description of the Japanese tuna longline fishery for bluefin tuna in the Atlantic.

DIVISION OF PELAGIC RESOURCES, FSFRL

A memorandum on the catch and effort statistics, length and weight measurement data and tag release and recapture data for the Atlantic bluefin tuna caught by the Japanese longline boats.

3.2 Documents presented at the 1979 SCRS Meeting

HONMA, M.

Overall fishing intensity, catch, catch by size and spawning indices of yellowfin tuna in the Atlantic tuna longline fishery, 1956-77.

KIKAWA, S. and M. HONMA

Status of the billfishes caught by the longline fisheries in the North Atlantic Ocean, 1956-1977.

KIKAWA, S. and Y. NISHIKAWA

Distribution of larvae of the yellowfin tuna and skipjack in the Atlantic Ocean.

KUME, S.

a) Overall fishing intensity of Atlantic longline fishery for bigeye tuna, 1956-77.

b) A production model approach to evaluate recent bigeye stock condition in the Atlantic.

SHIOHAMA, T.

Estimation of overall fishing intensity of Atlantic longline albacore, 1956-77.

SHINGU, C. and K. HISADA

Analysis on the Atlantic bluefin tuna stock.

SUZUKI, Z.

An aspect on catch of three major species, skipjack, yellowfin, and bigeye tunas, taken by the Japanese baitboat fleet based in Tema, 1969-78.

Table 1. Japanese catch (MT) of tunas and tuna-like fishes by types of fisheries, Atlantic Ocean and Mediterranean Sea, 1974-78.

Type of fishery	*1974*	*1975*	*1976*	*1977*	*1978**
Total.	69,419	38,610	42,288	42,842	38,992
Longline					
Subtotal	36,825	32,429	20,678	21,855	21,800
Deckloaded motherboat . .	--	259	--	--	--
Homeland-based boat	36,825	32,170	20,678	21,855	21,800
Purse seiner					
(Single-boat type)	1,918	291	--	--	--
Pole-and-line. . .	30,676	5,890	21,610	20,987	17,192

* Preliminary.

Table 2. Number of Japanese tuna boats which operated in the Atlantic Ocean and Mediterranean Sea, 1974-78.

Type of fishery	*Size class*	*1974*	*1975*	*1976*	*1977*	*1978*
Longline						
Deckloaded motherboat	201 - 500	-	1	-	-	-
Homeland-based boat	201 - 500	221	228	146	179	216
Purse seiner	201 - 400	1	1	-	-	-
(Single-boat type)	401 -	1	-	-	-	-
Pole-and-line	151 -	24	24	15	18	19

Table 3. Catch (MT) of tunas and tuna-like fishes taken by the Japanese Atlantic long-line fishery, 1974-78.

Year	*1974*	*1975*	*1976*	*1977*	*1978**
TOTAL	36,825	32,429	20,678	21,855	21,800
ATLANTIC					
Subtotal	34,630	31,169	19,707	21,335	21,700
Albacore	2,168	1,637	1,418	930	600
Bigeye	20,862	17,391	7,297	9,137	10,500
Bluefin	3,100	4,413	4,875	5,252	2,900
Southern bluefin	2,558	636	692	3,168	4,900
Yellowfin	3,475	4,192	3,366	1,467	1,700
Skipjack	0	1	0	0	0
Swordfish	1,369	1,500	808	792	650
Blue marlin	284	608	264	135	60
White marlin	390	418	543	106	60
Sailfish	137	150	137	47	30
Others	287	223	307	301	300
MEDITERRANEAN					
Subtotal	2,195	1,260	971	520	100
Albacore	0	0	1	0	0
Bluefin	2,195	1,260	968	520	100
Bigeye	0	0	1	0	0
Swordfish	0	0	1	0	0

* Preliminary.

Table 4. Catch (MT) of tunas and tuna-like fishes taken by the Japanese Atlantic pole-and-line fishery, 1974-78.

Year	*1974*	*1975*	*1976*	*1977*	*1978*
TOTAL	30,676	5,890	21,610	20,987	17,192
Albacore	0	0	0	2	0
Bigeye	606	328	3,588	1,144	1,201
Yellowfin	9,518	1,270	2,225	2,451	807
Skipjack	19,798	4,100	15,042	16,845	14,614
Frigate tuna	461	17	14	89	-
Others	293	175	741	456	570

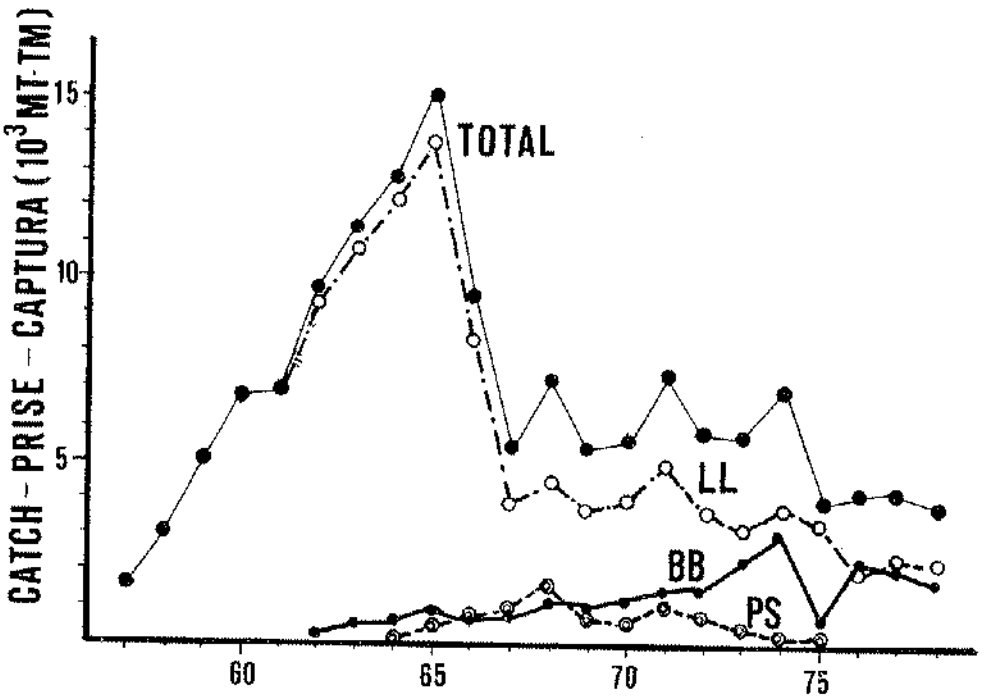


Fig. 1. Annual yield of the Japanese tuna fisheries in the Atlantic Ocean, 1957-78.

KOREAN RESEARCH AND FISHING ACTIVITIES FOR TUNA AND TUNA-LIKE FISHES IN THE ATLANTIC OCEAN IN 1978

1. Fishing activities

The total Korean catch of tuna and tuna-like fishes in the Atlantic Ocean amounted to 39,458 MT in 1978 (Table 1). This represents a decrease of about 12 percent compared with the total catch of the previous year and a 13 percent increase compared with that of 1976. The total catch can be broken down by types of gears as follows: 29,094 MT by 97 longliners, about a 25 percent decrease in comparison with the 1977 catch; and 10,364 MT by 20 baitboats, about a 67 percent increase compared with that of the previous year (Figures 1 and 2).

1.1 Longline fishery

The catch by longliners in 1978 totaled 29,094 MT which shows a 25 percent decrease over the previous year, and corresponds to 74 percent of the total catch in 1978. The catch (Table 2) consisted of 11,512 MT of yellowfin, 4,418 MT of albacore, 9,182 MT of bigeye, 42 MT of skipjack and 1,333 MT of swordfish.

The decrease of the 1978 catch was caused mainly by a shift of a considerable number of longliners from the Atlantic to other oceans.

1.2 The pole-and-line fishery

In 1978, 20 baitboats were dedicated to tropical tuna fishing in the east Atlantic Ocean. The fleet caught 8,132 MT of skipjack, 965 MT of bigeye, 941 MT of yellowfin and 326 MT of unclassified species, totaling 10,364 MT (Table 3). The 67 percent increase of the total baitboat catch in 1978 over the previous year was attributed to the increase in the number of baitboats in the area.

2. Research activities

It was impossible to send scientists to the Atlantic coast for field research in 1978 and 1979 because of the budgetary situation. However, the collection and analysis of catch/effort data and biological data from commercial fishing vessels has been done as in previous years.

Original report in English.

Table 1. Korean catch in MT and number of boats for tuna and tuna-like fishes in the Atlantic since 1964

Year	Number of boats			Catch (MT)		
	Longliner	Baitboat	Total	Longliner	Baitboat	Total
1964	1	-	1	167	-	167
1965	9	-	9	520	-	520
1966	54	-	54	7,114	-	7,114
1967	56	-	56	12,836	-	12,836
1968	49	-	49	12,624	-	12,624
1969	57	-	57	12,594	-	12,594
1970	105	-	105	34,865	-	34,865
1971	117	-	117	36,737	-	36,737
1972	105	2	107	35,736	-	35,736
1973	106	3	109	32,051	1,822	33,873
1974	124	8	132	33,568	4,412	37,980
1975	118	8	126	38,819	7,653	46,472
1976	121	6	127	31,575	3,339	34,914
1977	120	15	135	38,849	6,202	45,051
1978	97	20	117	29,094	10,364	39,458

Table 2. Catch in MT by species and percentage (italics) of tunas and tuna-like fishes taken in the Atlantic by Korean longline techniques, 1971-78

Year	Bluefin	Yellow-fin	Albacore	Bigeye	Skipjack	Sword-fish	Unclassified & others	Total
1971	3,039	9,901	11,539	7,353	47		4,858	36,737
	8.3	*27.0*	*31.4*	*20.0*	*0.1*		*13.2*	
1972	30	11,078	13,577	5,730	45		5,276	35,736
	0.1	*31.0*	*38.0*	*16.0*	*0.1*		*14.8*	
1973	66	12,844	8,525	5,829	—		4,787	32,051
	0.2	*40.1*	*26.6*	*18.2*	—	—		*14.9*
1974	56	15,518	5,216	7,376	116		5,286	33,568
	0.2	*46.2*	*15.5*	*22.0*	*0.3*		*15.7*	
1975	23	15,344	6,073	10,162	196	451	6,570	38,819
	0.1	*39.5*	*15.6*	*26.2*	*0.5*	*1.1*	*16.9*	
1976	10	11,211	8,755	6,747	26	1,147	3,679	31,575
	0.0	*35.5*	*27.7*	*21.4*	*0.1*	*3.6*	*11.7*	
1977	3	16,347	9,345	7,610	9	1,240	4,295	38,849
	0.0	*42.1*	*24.1*	*19.6*	*0.0*	*3.2*	*11.1*	
1978	—	11,512	4,418	9,182	42	1,333	2,607	29,094
	—	*39.6*	*15.2*	*31.6*	*0.1*	*4.6*	*9.0*	

Table 3. Catch in MT by species and percentage (italics) of tunas and tuna-like fishes taken in the Atlantic by Korean baitboats 1973-78

Year	*Yellowfin*	*Bigeye*	*Skipjack*	*Unclassified and others*	*Total*
1973	900	-	922	-	1,822
	49.4	-	*50.6*	-	
1974	2,169	-	2,123	120	4,412
	49.2	-	*48.1*	*2.7*	
1975	1,259	1,750	4,469	175	7,653
	16.5	*22.9*	*58.4*	*2.3*	
1976	365	810	1,948	216	3,339
	10.9	*24.3*	*58.3*	*6.5*	
1977	1,075	640	3,600	887	6,202
	17.3	*10.3*	*58.0*	*14.3*	
1978	941	965	8,132	326	10,364
	9.1	*9.3*	*78.5*	*3.1*	

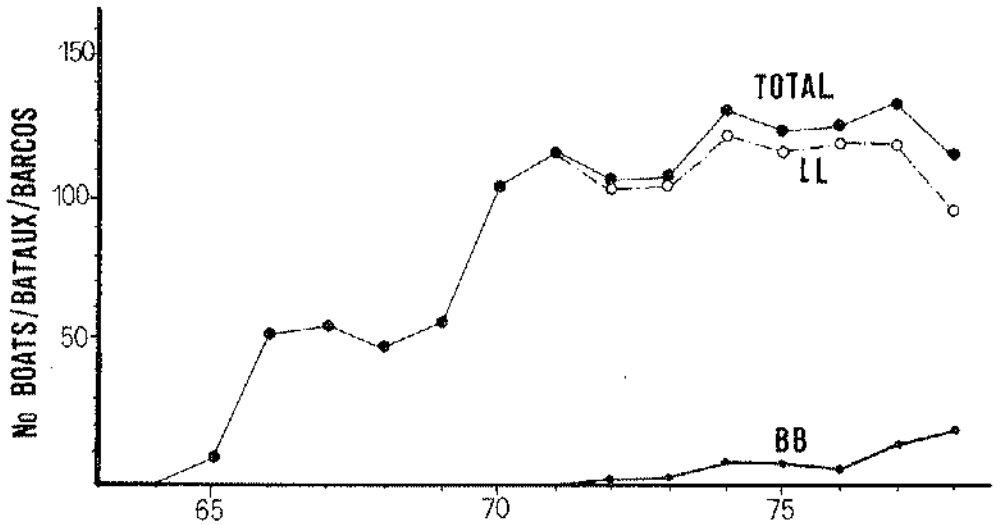


Fig. 1. Annual number of boats of Korean tuna fishery in the Atlantic Ocean, 1964-78.

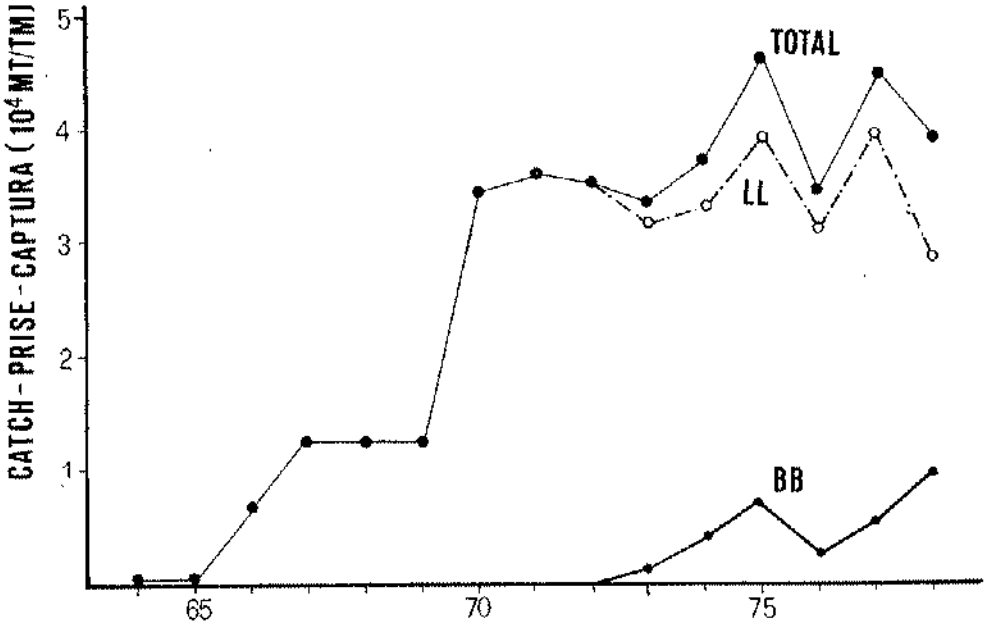


Fig. 2. Annual yield of Korean tuna fishery in the Atlantic Ocean, 1964-78.

REPORT ON TUNA FISHING AND RESEARCH IN SENEGAL IN 1978

by

P. CAYRE

1. Tuna fishing

Tuna landings and transshipments in Dakar, broken down by gear and species (yellowfin, skipjack and bigeye) in 1978 are shown in the attached table.

In 1978, the Dakar-based fleet was comprised of 29 baitboats and 6 purse seiners (4 Senegalese and 2 French). Catches in 1978 show a 20 percent increase as compared to those of 1977 and amount to 14,150 MT (4,300 MT of yellowfin, 6,250 MT of skipjack and 3,600 MT of bigeye). This increase is primarily due to the increased skipjack catches. On the contrary, transshipments have decreased since 1977 (-56 percent) and only amounted to 19,600 MT (7,600 MT for the Spanish fleet and 12,000 MT for the FIS fleet).

Preliminary estimates for 1979 (8,068 MT, all species, landed by the Dakar-based tuna fleet, up to September 30, 1979) indicate a decrease of 30 to 40 percent in catches. However, the transshipments in Dakar, up to September 30, 1979, show a large increase as compared to 1978. This increase would result in a total transshipped tonnage, at the end of the year, similar to that of 1977 (20,000 MT).

2. Research

Biological sampling and the collection of statistics, as well as population dynamic studies were continued in 1978 and 1979.

The agreement made with the "Instituto Español de Oceanografía" allowing the "Centre de Recherches Océanographiques" of Dakar-Thiaroye to sample Spanish transshipments in Dakar was extended in 1978. This allowed for 117 samples of the three species from 27 landings in 1978.

Research activities:

The sampling necessary to study fecundity and reproduction of skipjack caught by the Dakar fleet was carried out.

Original report in French.

Collection and transversal cross sections of the first dorsal fins of skipjack fished during 1978-79 have been completed. The results of this study will be published in 1980.

A study on the exploitation and the biology of small tunas (in particular, yellowfin) is now being carried out by CRODT.

3. Documents presented by CRODT to the 1979 SCRS meeting

FONTENEAU, A.

Croissance de l'albacore (*Thunnus albacares*) de l'Atlantique est.

BAGES, M. et A. FONTENEAU

Prises de la flottille thonière franco-ivoiro-sénégalaise et température de surface en 1977.

LEVENEZ, J. J., A. FONTENEAU et R. REGALADO

a) Résultats d'une enquête sur l'importance des dauphins dans la pêcherie thonière FISM.

b) Evolution numérique et pondérale des calées de la flottille de senneurs FISM ayant débarqué à Abidjan de janvier 1976 à juillet 1979.

CAYRE, P. et A. FONTENEAU

Analyse de l'état des stocks d'albacore (*Thunnus albacares*) et de listao (*Katsuwonus pelamis*) de l'Atlantique est au 30 septembre 1979.

Tuna landings at Dakar in 1978

Fishery	*Number of boats*	*Effort*	*Yellowfin*	*Skipjack*	*Bigeye*	*Total*
Dakar-based						
Baitboats	29	2,940	3,050	3,400	3,300	9,750
Purse seiners	6	880	1,250	2,850	300	4,400
Total	35	3,820	4,300	6,250	3,600	14,150
Foreign-based						
FIS	22	1,200	9,600	2,400		12,000
Spanish	20	1,100	2,600	4,500	500	7,600
Total	42	2,300	11,200	6,700	500	19,600

SOUTH AFRICAN NATIONAL REPORT

by

C. S. de V. NEPGEN

1. The fishery

Good catches were made in the second half of the year with the result that there was a substantial increase in the annual catch compared to that of the previous year. The total catch was still below 1,000 MT and consisted of 51 percent yellowfin, 27 percent albacore, 19 percent skipjack and 3 percent bonito.

The fishery was conducted by four vessels equipped with purse-seine nets and 51 sport fishing boats with commercial licenses.

2. Biological sampling

Sampling of purse-seine catches was done at Gans Bay on the southern coast of the Cape Province during the first four months of the year. A total of 115 yellowfin and 127 skipjack was examined.

Measurements of 3,762 albacore were taken from tuna transshipped by foreign boats in Table Bay Harbour.

3. The environment

Monthly biological and hydrographic surveys were carried out at a series of stations between 31°40'S on the South African west coast and 21°30'E on the south-east coast.

Original report in English.

NATIONAL REPORT OF SPAIN

by

A. GONZALEZ-GARCES
SPANISH OCEANOGRAPHIC INSTITUTE

1. The fisheries

During 1978, Spanish tuna catches reached 107,738 MT; this amount is similar to that of the 1977 catch (107,110 MT). The species distribution is as follows:

Species	*YF*	*SJ*	*BE*	*BF*	*ALB*	*SW*	*Others*
MT	39,946	28,932	3,850	3,661	25,404	4,320	1,625

These catches were obatained from three fishing zones: Gulf of Guinea, Canary Islands and around the Iberian Peninsula.

1.1 Gulf of Guinea

A purse seine fleet comprised of 40 vessels operated in this area. Two of these vessels operated for the first time in 1978 and one vessel was retired in the second quarter. The catches by this fleet were maintained at the same level as that of 1977; the total catch reached 62,070 MT. Of this amount 36,019 MT were yellowfin tuna and 24,900 MT were skipjack tuna.

1.2 Canary Islands

The fleet which operated in this zone was comprised of a considerable number of small baitboat vessels. The total catch was 7,359 MT, distributed by species as follows:

Species	*YF*	*SJ*	*BE*	*BF*	*ALB*
MT	243	558	3,850	1,548	1,160

These figures represent a slight increase in almost all the species as compared with the previous year, although effort was maintained at levels similar to those of last year.

Original report in Spanish.

1.3 Iberian Peninsula

In this area various types of fishing gear were used in the Atlantic as well as in the Mediterranean. The total catch reached 30,677 MT, distributed by species as follows:

	ALB (MT)	*BF (MT)*	*SW (MT)*
Atlantic Ocean	24,244	2,028	3,600
Mediterranean Sea	---	85	720

The gears used were: trolling, baitboat, longline and traps. In the Atlantic, trollers caught principally albacore. This year 280 vessels operated and caught 14,131 MT of albacore. Baitboats which operated in the Atlantic caught 10,113 MT of albacore and 1,578 MT of bluefin. It should be noted that the catch of these species was not made together. In the case of albacore, the vessels did almost no fishing during the fourth quarter and therefore, effort decreased considerably.

The longline vessels, which are small (from 40 to 100 GT) fished almost exclusively swordfish and caught 3,600 MT in the Atlantic and 720 MT of this species in the Mediterranean, a decrease from the previous year. These small longliners caught 85 MT of bluefin in the Mediterranean. 450 MT of bluefin were caught by traps.

2. Research

Of special interest was the collection and processing of data from the tropical tuna fisheries, principally detailed catch and effort data. Although the coverage rate is still low (28 percent), we expect to improve it progressively.

Biological samplings in this area are at a good level, but they can be improved. During 1978, 11,151 fish were measured, as follows: 6,139 yellowfin, 3,786 skipjack, 1,106 bigeye and 120 Atlantic little tuna.

For the Iberian Peninsula, fisheries Task I and Task II data were collected routinely for ICCAT. Biological sampling continued. 9,000 albacore, 5,000 bluefin and 3,000 swordfish were measured.

During the period 1978-79 three tagging cruises for bluefin and small tunas were carried out in traps in the Strait of Gibraltar. Two bluefin tagging cruises were carried out in the Bay of Biscay, using a trolling vessel for one cruise and a baitboat vessel for the other. Spanish scientists also participated in two exploratory cruises for tuna eggs and larvae in the Mediterranean, in collaboration with Italy.

Work was carried out on analysis of the fleet composition, catches and yield as well as fishing zones, in the area of the Gulf of Guinea. Analysis was also carried out on the albacore and bluefin stocks of the North Atlantic.

3. Documents presented to the 1979 SCRS meeting

BARD, F. X. and J. L. CORT

Evaluation of apparent recruitment of bluefin tuna in the eastern Atlantic, west of Gibraltar.

BARD, F. X. and A. GONZALEZ-GARCES

Etat du stock de germon (*Thunnus alalunga*) Nord Atlantique en 1979.

CORT, J. L. and F. X. BARD

La pesquería vasca de atún rojo (*Thunnus thunnus*) del Golfo de Vizcaya, 1966-79.

CORT, J. L., E. DE CARDENAS and J. C. REY

Experiencias de marcado de atún rojo (*Thunnus thynnus*) en el Golfo de Vizcaya por el procedimiento del cebo vivo.

DICENTA, A., C. PICCINETTI et al.

Comparison between the estimated reproductive stocks of bluefin tuna (*Thunnus thynnus*) of the Gulf of Mexico and western Mediterranean.

FERNANDEZ, A. M. and J. M. GARCIA MAMOLAR

Pesquería española de cerco de túnidos tropicales. Comentarios sobre su evolución en el período 1967-79.

GONZALEZ-GARCES, A.

Informe nacional de España.

REVIEW OF UNITED STATES FISHERIES AND RESEARCH ACTIVITIES ON TUNAS AND TUNA-LIKE FISHES OF THE ATLANTIC OCEAN FOR 1978-1979

by

NATIONAL MARINE FISHERIES SERVICE[1]

1. The fisheries

United States commercial catches of Atlantic tuna and tuna-like fishes in 1978 increased 3,300 MT over catches in 1977 (Table 1). Increased participation in 1978 by American purse seiners in the tropical tuna fisheries resulted in increased catches of both yellowfin tuna (*Thunnus albacares*) and skipjack tuna (*Katsuwonus pelamis*). The bluefin tuna (*Thunnus thynnus*) fishery continued to be under strict regulations, allowing for no expansion in the catch.

1.1 Tropical tunas

Twenty-two American purse seiners fished in the eastern Atlantic tropical tuna fishery in 1978, an increase of 10 over 1977 (Table 2). Their catches were mainly yellowfin tuna (8,131 MT) and skipjack tuna (6,797 MT). Incidental catches (401 MT) of bigeye tuna (*T. obesus*), albacore (*T. alalunga*), little tunny (*Euthynnus alletteratus*) and unclassified species were also included.

Most U.S. fishing was concentrated in the eastern tropical Atlantic where approximately 2,300 days fishing were expended by the American fleet. Catch rates were 3.2 MT of yellowfin tuna and 2.4 MT of skipjack tuna per day's fishing. These catch rates are lower than those experienced by the fleet in 1977 (Table 2).

The U.S. tropical tuna fishery operates under a minimum size regulation of 3.2 kg for yellowfin tuna with a 2 percent by weight incidental catch allowance of undersized fish per boat landing. The catch of undersized yellowfin tuna by the U.S. fleet in 1978 was approximately 8 percent of the fleet's total yellowfin catch.

[1]Prepared by staff members of the Southwest Fisheries Center, La Jolla, California, and the Southeast Fisheries Center, Miami, Florida.

Original report in English.

In 1979, U.S. participation in the Atlantic tropical tuna fishery decreased sharply to an estimated 7 seiners. This decrease is probably related to the late closure (July 21) of the Inter-American Tropical Tuna Commission's Commission Yellowfin Regulatory Area (CYRA) in the eastern tropical Pacific. The total 1979 catch of Atlantic tropical tunas is predicted to be approximately 7,000 MT, a 62 percent decrease from the 1978 catch.

1.2 Temperate tunas

The bluefin tuna fishery of the northwestern Atlantic Ocean is an important fishery for the United States. In 1978 as in 1977, the fishery operated under strict size, catch and season regulations. This resulted in a total catch of 1,852 MT, which is about 100 MT lower than the 1977 catch (Table 3).

Similar regulations are in effect for the 1979 fishery. Preliminary estimate of the 1979 total catch is 2,040 MT.

1.3 Miscellaneous tuna-like species

The United States commercial fishery for Spanish mackerel, *Scomberomorus maculatus*, and king mackerel, *S. cavalla*, is centered primarily off Florida. Landings in 1978 showed an appreciable decrease from those in 1977. Despite this decrease, the trend in landings for this fishery has been fairly stable over the past 11 years.

2. Research activities

United States research responsibilities for Atlantic tuna and tuna-like fishes are divided between the Miami and Galveston Laboratories of the Southeast Fisheries Center (SEFC) and the La Jolla Laboratory of the Southwest Fisheries Center (SWFC). Studies in 1978-79 involved life history, stock identification, stock assessment, fishery evaluation and related topics in support of international tuna fishery management deliberations, in support of domestic management requiremets and in response to recommendations of ICCAT's SCRS. Research on Atlantic bluefin tuna and billfishes (*Istiophoridae* and *Xiphiidae*) were conducted by the SEFC, and research on tropical tunas and albacore were conducted by the SWFC. The results of the research are contained in documents submitted to the 1979 SCRS.

2.1 Tropical tunas

Research, during 1978-79, continued on stock assessment and evaluation of Atlantic tropical tuna fisheries. The U.S. fisheries were closely monitored and biological and fishery data collected. Import landings of Atlantic-caught tunas were sampled (8,794 fish sampled in 1978) for biological information in Puerto Rico. Atlantic tuna catch, effort and biological data bases were updated.

Analyses of tropical tuna fishery, biological and environmental data were performed. The condition of yellowfin tuna stocks and the adequacy of available data for

determining the effects of management actions were assessed. Available western Atlantic skipjack tuna data were evaluated; environmental data were used to determine the vulnerability of skipjack tuna to surface gears. Bigeye tuna growth was evaluated. New studies have been initiated on fecundity of bigeye and yellowfin tuna and on evaluating the sensitivity of certain population dynamic techniques.

Special emphasis in 1979 was given to continued planning for ICCAT's International Skipjack Year. Preliminary plans for a 1980 U.S. skipjack tagging and biological data gathering cruise have been made. A vessel has been contracted.

2.2 Temperate tunas

In 1978-79 the major thrust of the research was directed at verifying the bluefin tuna catch by size data base. A special bluefin workshop was held in Santander, Spain for the purpose of obtaining agreement on the data base. Stock assessments will be forthcoming from the verified data base. Other aspects of research included the monitoring of the U.S. commercial and recreational catch; studies on stock identification using electrophoresis and parasites; a continuing tagging program; growth and ageing; and larval distribution and abundance. A new study is being initiated on stock variation using x-ray florescence.

Research on Atlantic albacore continued in 1978-79. Major emphasis was on estimating the probability of recruitment failure of the North Atlantic albacore stock based on spawner/recruit relations.

2.3 Billfishes

In 1978-79, efforts were concentrated on assessing the status of blue marlin, white marlin, and sailfish stocks in the Atlantic Ocean. Monitoring of catch and effort from the recreational fishery continued; in 1978 over 53 thousand hours of fishing were recorded. A survey to determine total catch by species from the recreational fishery was completed during 1978. Age and growth analyses of blue marlin, white marlin, and swordfish are continuing.

3. Documents submitted to the 1979 SCRS Meeting

BAGLIN, R. E. and M. I. FARBER

Length and weight parameters of western Atlantic bluefin tuna, (*Thunnus thynnus*).

BAGLIN, R. E., M. I. FARBER, W. H. LENARZ and J. M. MASON

Estimates of shedding rates of two types of dart tags from north-western Atlantic bluefin tuna, (*Thunnus thynnus*).

BARTOO, N. W.

Further analysis of spawner/recruit relationships for North Atlantic albacore.

BEARDSLEY, G. L.

Size and possible origin of sailfish, (*Istiophorus platypterus*) from the eastern Atlantic Ocean.

BRUNENMEISTER, S.

A summary and discussion of technical information pertaining to the geographical discreteness of Atlantic bluefin tuna resources.

COAN, A. L.

Production model analyses for Atlantic yellowfin tuna (*Thunnus albacares*) 1964 to 1978: How are the conclusions affected by current CPUE estimates?

COAN, A. L., N. W. BARTOO and S. M. MOORE

An evaluation of the adequacy of available length-frecuency and catch-effort data for determining the effectiveness of alternate management actions designed to raise the yield-per-recruit of yellowfin tuna in the eastern tropical Atlantic.

CONSER, R. J.

a) An assessment of the status of stocks of blue marlin and white marlin in the Atlantic Ocean.

b) Production model analysis of the sailfish and spearfish stocks in the Atlantic Ocean.

CONSER, R. J. and G. L. BEARDSLEY

An analysis of billfish catch and effort data from the recreational and longline fisheries in the northern Gulf of Mexico.

EVANS, R. H., D. R. McLAIN and G. L. BEARDSLEY

Atlantic skipjack tuna: influences of the environment on their vulnerability to surface gear.

FARBER, M. I.

A preliminary analysis of mortality of bluefin tuna, *(Thunnus thynnus)*, tagged in the northwestern Atlantic Ocean.

FARBER, M. I. and T. CHEWNING

An update of U.S. bluefin tuna tagging.

JOHNSON, A. G., W. A. FABLE, L. E. BARGER and M. L. WILLIAMS

Preliminary report on the age and growth of king mackerel, (*Scomberomorus cavalla*), from the United States.

NICHOLS, S.

Potential yields of bluefin tuna under independent management of the east and west Atlantic fisheries.

PALKO, B. J., G. L. BEARDSLEY and W. J. RICHARDS

A synopsis of the biology of the broadbill swordfish, (*Xhiphias gladius*). (Linnaeus, 1758)

PARRACK, M. L.

Trends of the abundance and age structure of Atlantic bluefin tuna.

RICHARDS, W. J. and T. POTTHOFF

a) Distribution and abundance of bluefin tuna larvae in the Gulf of Mexico in 1977 and 1978.

b) Larval distributions of scombrids (other than bluefin tuna) and swordfish in the Gulf of Mexico in the spring of 1977 and 1978.

SIMS, S. E. and M. L. PARRACK

The effects of unevenly distributed catches on virtual population analysis.

THOMPSON, H. and R. CONTIN

Electrophoretic study of Atlantic bluefin tuna (*Thunnus thynnus*) from the eastern and western North Atlantic Ocean.

WALTERS, V.

Ectoparasites of eastern and western Atlantic bluefin tunas.

WEBER, E.

An analysis of Atlantic bigeye tuna (*Thunnus obesus*) growth.

Table 1. Catch and landing (MT) of Atlantic tunas and tuna-like fishes by American fishermen, 1967-78[1]

Year	Blue-fin	Yellow-fin[2,3]	Albacore	Big-eye[2]	Little tunny	Skip-jack[2]	Bonito	Sword-fish	Spanish mackerel	King mackerel	Unclassi-fied	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[4]	1,956	7,208	2	331	53	6,179	268	912	5,453	3,837	71	26,270
1978[4]	1,852	9,747	9	248	113	8,492	224	3,039	3,310	2,507	31	29,572

1 Estimated catch is for bluefin tuna, yellowfin tuna, albacore, bigeye tuna, skipjack tuna and little tunny. Landing is for all other species. Sport catches are not included, except for bluefin tuna.
2 Includes catches of purse seiners flying the flags of Bermuda, Netherlands Antilles, Nicaragua and Panama.
3 Includes small quantities of bigeye tuna prior to 1975.
4 Preliminary, except for the bluefin tuna catch.

Table 2. Summary of logbook estimates of catch and catch rate of yellowfin and skipjack tunas caught by American seiners[1] in the eastern tropical Atlantic

Year	Number of seiners	Yellowfin Catch (MT)	Yellowfin Catch rate (metric tons/ days fishing)	Skipjack Catch (MT)	Skipjack Catch rate (metric tons/ days fishing)
1967	3	1,000	7.8	500	3.8
1968	8	6,200	23.3	3,200	12.0
1969	25	19,800	10.9	4,400	2.4
1970	24	9,100	4.0	11,400	5.1
1971	22	4,400	2.7	16,100	10.0
1972	35	10,900	3.3	12,200	3.7
1973	21	2,600	2.2	20,400	17.0
1974	26	5,600	2.8	20,000	8.7
1975	32	14,000	5.6	7,400	2.7
1976	7	1,706	5.2	1,766	5.1
1977	12	6,400	4.4	5,859	3.8
1978	22	8,131	3.2	6,797	2.4

1 Purse seiners flying the flags of Bermuda, Netherlands Antilles, Panama and U.S.A. are included. Data were collected by the Inter-American Tropical Tuna Commission through contract.

Table 3. Catch (MT) and fishing season by size of fish for the United States fishery for Atlantic bluefin tuna

	1976		*1977*		*1978*		*1979*[3]	
	Catch	*Season*	*Catch*	*Season*	*Catch*	*Season*	*Catch*	*Season*
Small (ages 1-5)								
Purse seine	1,079	10 June-29 June; 8 July-18 July	1,058	15 June-20 June; 1 July-15 July	912	12 June-30 June; 22 Aug.-30 Aug.	1,021	6 June-16 June
Sport[1]	29	1 Jan.-31 Dec.	56	1 Jan.-31 Dec.	68	1 Jan.-4 Sept.	73	1 Jan.-31 Dec.
Giant (ages 7)								
Purse seine	169	1 Sept.-21 Sept.	168	1 Sept.-18 Sept.	77	5 Sept.-12 Oct.[2]	321[4]	15 Aug.-24 Aug. 30 Aug.-12 Sept.
Hand gear	654	18 May-31 Dec.	674	1 Jan.-31 Dec.	795	1 Jan.-12 Oct.[2]	625	
TOTAL	1,931		1,956		1,852		2,040	

1 Sport fishing is with rod-and-reel.
2 Includes 3 MT medium-sized fish (ages 5, 6 and 7) caught under special scientific quota.
3 Estimated through the whole year from data for Jan.-October.
4 Includes 20 MT medium-sized fish (ages 5, 6, and 7) caught under special scientific quota.

NATIONAL REPORT OF THE U.S.S.R.

by

ATLANTNIRO

1. Longline Fisheries Objectives

The biostatistical data on two main commercial tuna species (bigeye and yellowfin) were collected and processed by the AtlantNIRO scientists in 1978-79. The data on yellowfin tuna catches by age groups and months (ICCAT Areas 14-15; 13,770 sp.) and bigeye tuna catches (Areas 44-45; 48,077 sp.) were obtained in 1965-76 and 1970-78, respectively. Fishery statistics for 1979 were analyzed.

The research cruise data showed that in 1979 commercial tuna aggregations were observed on the periphery of the Equatorial Countercurrent within the interaction zones of the South Equatorial and Northern Equatorial Currents, i.e. within the areas of the upwelling of the intermediate waters favourable for biological productivity zone formations (April-June). The gonads of bigeye and yellowfin tunas were immature, and their feeding was moderate at that period. Therefore, stable spawning-feeding aggregations were not formed and the fish migration occurred against the background of unsteady hydrological processes in the period of inter-seasonal changes.

The largest bigeye tuna catches were recorded at the limit of 170-250 m below the surface. At the same time, the largest yellowfin tuna and swordfish catches were taken at the limit of 70-90 m below the surface. In the upper part of the longline (from 2 to 5 hooks) the bigeye tuna mean length was 131.8 cm. In the lower part of the longline (from 6 to 9 hooks) this length was somewhat less. The mean speed of vertical movement of species towards the surface is 1.0 m/hour from 12 p.m. to 6 p.m. The speed increases to 4.2 m/hour from 6 to 10 p.m.

The preliminary analysis of tuna mothership operations in the open Gulf of Guinea (winter-spring period) showed that bigeye tunas (about 90 percent) dominated in the tuna catches and swordfish (98 percent) were dominant in *Xiphiidae* catches. The most favourable period for fishing operations was recorded in the second half of February and in the first half of March. The spawning of bigeye tuna aggregations fished was active and the feeding of yellowfin aggregations was intensive. In February-June 1979, the size of bigeye tunas in that area fluctuated within the range of 60-200 cm, the mean sizes varied between 120 and 156 cm, and for yellowfin tunas the sizes were 80-190 and 70-122 cm respectively. The swordfish aggregations were represented by the individuals of 90-250 cm

Original report in English.

in length (172-187 cm on the average) and 163-166 cm in February-March and May-June respectively.

2. Purse Seine Fishery Objectives

The minimum biomass of small tunas (yellowfin, skipjack, little tunny and frigate tuna) estimated by means of visual and radiolocation observations of the bird flocks accompanying the fish schools and expressed as tons per one square mile according to the average long-term data was 0.14-1.90 tons. The total minimum biomass of these species in the eastern tropical Atlantic varies within the range of 288.0 to 449.6 thousand tons.

The water-soluble muscular proteins of the above-mentioned tunas from East Tropical Atlantic were examined by means of the method of electrophoretic fractionation in the polyacrylamide gel. Genetically determinate polymorphism in the muscular esterases was observed in all species. The geno-geographical material is accumulated for the investigation of these species stock structure.

In addition the regional differences in the annual sexual cycles which may be used as ecologically conditioned "tags" of the local groupings were found to be considerable.

The scientific searching expeditions showed that in 1979 the winter-spring period hydrometeorological conditions in the open Gulf of Guinea were unfavourable for the purse-seine fishery (rough sea and dense cloudiness did not promote the appearance of tunas on the surface). In the control catches, skipjack were represented by individuals of 35-48 cm, the mean size and weight were 41.0 cm and 1.4 kg, respectively; the specimens observed were predominantly post-spawned (March-April). Frigate tuna of 35-44 cm in length (mean sizes and weight were 40.5 cm and 1.2 kg, respectively; mainly maturing specimens), little tunny of 40-50 cm (mean sizes and weight of 44 cm and 1.6 kg, respectively; maturing specimens) and young skipjack of 59 cm in length anf 4 kg in weight were also recorded in the control catches.

Four tuna research-fishing expeditions (purse-seine fishing - 2; longline fishing - 2) were carried out in 1978-79.