INTERNATIONAL COMMISSION
for the
CONSERVATION of ATLANTIC TUNAS

R E P O R T
for biennial period, 1992-93
PART I (1992)
English version

MADRID, SPAIN 1993

INTERNATIONAL COMMISSION FOR THE CONSERVATION OF ATLANTIC TUNAS

Contracting Parties (as of December 31, 1992)

Angola, Benin, Brazil, Canada, Cape Verde, Côte d'Ivoire, Equatorial Guinea, France, Gabon, Ghana, Japan, Korea, Morocco, Portugal, Republic of Guinea, Russia, Sao Tomé & Principe, South Africa, Spain, United States, Uruguay, Venezuela.

Chairman of Commission

Dr. A. RIBEIRO LIMA, Portugal
(from November 15, 1991)

First Vice-Chairman of Commission

Mr. K. SHIMA, Japan
(from November 15, 1991)

Second Vice-Chairman of Commission

Mr. L. G. PAMBO, Gabon
(from November 15, 1991)

Panel Membership (from November 15, 1991)

Panel	Contracting Parties	Chairman
1	Angola, Brazil, Cape Verde, France, Gabon, Ghana, Côte d'Ivoire, Japan, Korea, Morocco, Portugal, Russia, Sao Tomé & Principe, Spain, United States, Venezuela.	Côte d'Ivoire
2	Canada, France, Japan, Korea, Morocco, Portugal, Spain, United States.	Morocco
3	Brazil, Japan, South Africa, Spain, United States.	United States
4	Angola, Canada, France, Japan, Korea, Portugal, Russia, Spain, United States, Venezuela.	Russia

Council

No election was conducted for the 1992-93 biennial period.

Standing Committees

Standing Committees:	Chairman
Committee on Finance and Administration (STACFAD)	Mr. D. SILVESTRE, France (from November 15, 1991)
Committee on Research and Statistics (SCRS)	Dr. J. L. CORT, Spain (from November 1, 1989)

Secretariat

Príncipe de Vergara, 17, 28001 Madrid (Spain)
Executive Secretary: Dr. ANTONIO FERNÁNDEZ (from March 1, 1992)
Assistant Executive Secretary: Dr. PETER M. MIYAKE

FOREWORD

The Chairman of the International Commission for the Conservation of Atlantic Tunas presents his compliments to the Contracting Parties of the International Convention for the Conservation of Atlantic Tunas (signed in Rio de Janeiro, May 14, 1966), as well as to the Delegates and Advisers that represent said Contracting Parties, and has the honor to transmit to them the ***"Report for the Biennial Period, 1992-93, Part I (1992)"***, which describes the activities of the Commission during the first half of said biennial period.

This volume contains the reports of the Eighth Special Meeting of the Commission, held in Madrid, in November, 1992, and the reports of all the meetings of the Panels, Standing Committees and Sub-Committees. It also includes a summary of the activities of the Secretariat and a series of National Reports of the Contracting Parties of the Commission, relative to their activities in tuna and tuna-like fisheries in the Convention Area.

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

Dr. A. Ribeiro Lima
Commission Chairman

TABLE OF CONTENTS

CHAPTER I

SECRETARIAT REPORTS

ADMINISTRATIVE REPORT 1992
COM/91/8 (Revised)*

The ICCAT Executive Secretary, who assumed his duties on March 1, 1992, hereby presents the 1992 Administrative Report.

1. Contracting Parties of the Commission

As of December 31, 1992, the Commission was comprised of the following 22 Contracting Parties: Angola, Benin, Brazil, Canada, Cape Verde, Côte d'Ivoire, Equatorial Guinea, France, Gabon, Ghana, Japan, Republic of Guinea, Republic of Korea, Morocco, Portugal, Russia, Sao Tomé & Principe, South Africa, Spain, Uruguay, United States, and Venezuela.

2. Bodies of the Commission

Since November 15, 1991, the officers of the Commission are as follows:

Chairman: Dr. A. Ribeiro Lima (Portugal)
First Vice-Chairman: Mr. K. Shima (Japan)
Second Vice-Chairman: Mr. L. G. Pambo (Gabon)

The Panels are comprised as follows:

Panel	*Contracting Parties*	*Chairman*
1	Angola, Brazil, Cape Verde, France, Gabon, Ghana, Côte d'Ivoire, Japan, Korea, Morocco, Portugal, Russia, Sao Tomé & Principe, Spain, United States, Venezuela	Côte d'Ivoire
2	Canada, France, Japan, Morocco, Korea, Morocco, Portugal, Spain, United States	Morocco
3	Brazil, Japan, South Africa, Spain, United States	United States
4	Angola, Canada, France, Japan, Korea, Portugal, Russia, Spain, United States, Venezuela	Russia

Other bodies of the Commission are as follows:

a) Standing Committee on Finance Administration (STACFAD)
Chairman: Mr. D. Silvestre (France)

*The Administrative Report presented at the 1992 Commission Meeting was revised.

b) Standing Committee on Research and Statistics (SCRS)
Chairman: Dr. J. L. Cort (Spain)

b.1 Sub-Committee on Statistics
Convener: Dr. S. Turner (United States)

b.2 Sub-Committee on Environment
Convener: Mr. J. Pereira (Portugal)

c) Infractions Committee
Chairman: Mr. A. J. Penney (South Africa)

3. Ratification of the Paris Protocol to the ICCAT Convention

On May 15, 1992, the Director General of FAO informed having received from the Government of Canada on February 3, 1992, an instrument of ratification of the Protocol of amendment to the ICCAT Convention, that was adopted in Paris on July 10, 1984.

In accordance with Article III, the Protocol will enter into effect once all the Contracting Parties to the Convention have deposited with the Director General of FAO an instrument of ratification, approval or acceptance. The date of entry into force will be the thirtieth day following the deposit of the last instrument.

Of the 22 countries that are currently Contracting Parties to ICCAT, 18 countries have ratified or accepted the aforementioned Protocol. Cuba and Senegal, which are no longer Contracting Parties, had also accepted the Protocol earlier. Consequently, for the Paris Protocol to enter into effect, the ratification or acceptance by the governments of four Contracting Parties is still pending (Benin, Gabon, Morocco, and the Republic of Guinea).

The Chairman of the Commission had sent a letter, dated March 27, 1992, to the governments of these countries, expressing his wish that they would proceed with the ratification of the Protocol as soon as possible, so as not to delay the entry into force any longer.

4. Conference of Plenipotentiaries to amend the ICCAT Convention as concerns the calculation of the financial contributions of the Contracting Parties

At the Twelfth Regular Meeting of the Commission, held in Madrid on November 11-15, 1991, it was decided to call a Conference of Plenipotentiaries of the Contracting Parties, in order to modify Article X, paragraph 2, of the ICCAT Convention.

This Conference of Plenipotentiaries was held in Madrid on June 4 and 5, 1992, at the Spanish Ministry of Agriculture, Fishing and Food. Of the 22 Contracting Parties to the Convention, 16 were represented. The Conference elected Dr. A. Ribeiro Lima (Portugal) as Chairman and Mr. L. G. Pambo (Gabon) as Vice-Chairman. Dr. L. Koffi (Côte d'Ivoire) was designated Rapporteur and Dr. A. Fernández (ICCAT) was designated General Secretary of the Conference. The Food and Agriculture Organization of the United Nations (FAO), whose Director General is the depositary of the ICCAT Convention, was represented by Dr. D. Fadda, Legal Advisor.

At the end of its deliberations, the Conference adopted a Protocol referring to the modification of Article X of the Convention, which was signed by the representatives of Brazil, Côte d'Ivoire, France, Ghana, Morocco, Portugal and Spain. Later, the Protocol was deposited with the Director General of FAO, where it remained open for ratification or acceptance by the Contracting Parties. A special procedure was adopted for the entry into force of the aforementioned Protocol, which takes into account that the contributions of the countries with a developed market economy would increase, while those corresponding to developing countries would decrease.

On October 22, 1992, the Protocol was signed in Rome by the representative of the United States.

The Commission of ICCAT, at its first meeting held after the entry into force of this amendment to the Convention, should introduce in the Financial Regulations the calculation method resulting by the application of the basic principles for the new calculation scheme of the Contracting Parties' contributions, adopted at the Twelfth Regular Meeting of the Commission.

The texts of the Final Act and the Protocol adopted are included for information as Annex 15 to the 1992 Commission Proceedings.

5. ICCAT Regulations/Port Inspection

At the time of the Twelfth Regular Meeting of the Commission (November, 1991) regulatory measures on bluefin tuna were proposed and adopted. The

Commission also confirmed maintaining the regulations on yellowfin, bigeye and swordfish.

On February 6, 1992, the Secretariat transmitted to the Contracting Parties the definitive text of the recommendations adopted on bluefin tuna during 1992 and 1993. The recommendations for regulation of the east Atlantic stock are the same as in previous years, while for the west Atlantic stock more restrictive measures were recommended to permit a more rapid rebuilding of these stocks.

In Document COM/92/20, the Secretariat presented updated information on the regulation schemes in effect on the four species, with indications of the historical development of the regulations adopted by the Commission.

In Document COM/92/21, updated information was also presented on the status of the ICCAT Port Inspection Scheme, including a list of authorized inspectors and correspondents.

6. Meetings organized by ICCAT

6.1 Working Group on Catches of Bluefin tuna by Non-Contracting Parties

In accordance with a recommendation contained in the Resolution adopted concerning this matter at the Twelfth Regular meeting of the Commission, the first meeting of the Working Group on Catches of Bluefin Tuna by Non-Contracting Parties was held in Tokyo (Japan) on May 19-22, 1992, at the invitation of the Government of Japan. Representatives of nine non-Contracting Parties, twelve ICCAT Contracting Parties, as well as two members of the ICCAT Secretariat attended the meeting. The Assistant Executive Secretary served as Rapporteur.

The Working Group studied this important matter in detail, mainly as regards bluefin tuna that are caught outside the statistical control of ICCAT, since such data are not available to the ICCAT scientific body that is responsible for carrying out assessments on these stocks. The Group also studied possible methods to collect such statistical information and recognized that the problem required immediate action. The Group decided, at least for the time being, to undertake diplomatic demarche with these Non-Contracting Parties in order to obtain the necessary data. The Working Group's report is included as Annex 5 to the 1992 Commission Proceedings.

6.2 Management Review Committee for West Atlantic Bluefin Tuna

This special Committee, created in accordance with the recommendations made by the Commission in 1991 for the enhancement of the current management measures of western Atlantic bluefin tuna, held its First Meeting in Tokyo (Japan) on May 22 and 25, 1992. The Committee was attended by representatives from Canada, Japan, and the United States, as well as two members of the ICCAT Secretariat. The Assistant Executive Secretary served as Rapporteur.

The Management Review Committee concluded that the current system of reporting catch and effort data on bluefin tuna was inadequate, and that the magnitude of catch and effort by non-Contracting Parties was not fully known, which negatively affects the effectiveness of the management measures adopted by ICCAT. Therefore, the Committee recommended that a statistical reporting system, that is consistent with the General Agreement on Tariffs and Trade (GATT), be established so as to assure that the real levels of fishing effort and harvest of this stock are known.

After considering a possible reduction in the fishing level to 50% of the current scientific monitoring level for west Atlantic bluefin tuna for a more rapid rebuilding of this stock, the Committee decided to postpone its decision until it had the appropriate report of the SCRS.

The Management Review Committee held its Second Meeting in Washington, D.C. (U.S.A.) on September 11, 1992. The Reports of both meetings are included in Annex 9 to the Proceedings of the 1992 Commission Meeting.

6.3 Data Preparatory Meeting on Tunas and Tuna-like Fishes in the Southwestern Atlantic

The Data Preparatory Meeting on Tunas and Tuna-like Fishes in the Southwestern Atlantic was held at the Rural Federal University of the State of Pernambuco (Brazil) on July 1 to 7, 1992, at the invitation of IBAMA and the aforementioned University. Scientists from Brazil, Japan, United States, and Venezuela participated in the meeting. The ICCAT Secretariat was represented by the Assistant Executive Secretary, who served as Rapporteur. The Group reviewed the fisheries of the southwestern Atlantic area, and examined the Task I catch and Task II catch and effort and size data relative to these fisheries,

which are available in the ICCAT data base. Since all the scientists responsible for the collection of statistics and sampling data from the different areas of Brazil were present at the meeting, a significant improvement in the statistics of the host country was made. A considerable number of discrepancies in the data from different sources were eliminated. New data were presented and revisions of previous data were made. Also, it was found that a significant number of these data had not been previously notified to the Secretariat and, hence, they were missing from the ICCAT data base.

The Meeting studied various biological parameters, and observed that there is a considerable amount of biological and morphormetric data available to analyze, and recommended the work that should be carried out before the upcoming ICCAT meetings. The Report of this Data Preparatory Meeting was presented to the Commission as COM/SCRS/92/15.

6.4 Second ICCAT Billfish Workshop

The Second ICCAT Billfish Workshop was held at the Southeast Fisheries Center (Miami, U.S.A.) from July 22 to 29, 1992, at the invitation of the Government of the United States. This meeting was proposed by the SCRS in 1990 and was approved by the Commission in 1991. The Assistant Executive Secretary and the Systems Analyst participated on behalf of the Secretariat. During the Workshop, the Group reviewed the progress made by the ICCAT Enhanced Research Program on Billfish as well as the data that the Secretariat has been compiling and processing. The Group recognized the need to continue the activities of the Program and requested that the plan for 1993 be prepared for the SCRS. The Workshop Report was presented to the Commission as Document COM/SCRS/92/12.

6.5 Second Joint GFCM/ICCAT Expert Consultation on Stocks of Large Pelagic Fishes in the Mediterranean

The SCRS as well as the Commission had considered that holding this Second Joint Consultation with the General Fisheries Council for the Mediterranean (FAO) was interesting, in view of the inadequacy of the ICCAT data base for the Mediterranean area and to the urgent need to carry out an improved assessment of the stocks of bluefin tuna, swordfish and albacore in the Mediterranean. After considerable adjustments concerning a time schedule that was suitable to both organizations, the meeting was held from September 17 to 23, 1992, at the University of Heraklion (Crete), at the invitation of the Greek authorities. The Commission of the European Community participated in the financing of the Consultation, and the ICCAT Secretariat served as Technical Secretary. The Assistant Executive Secretary and the Systems Analyst attended the meeting from ICCAT. The report, written by various rapporteurs, was edited by the ICCAT Assistant Executive Secretary and was presented as Document COM/SCRS/92/17.

6.6 Species stock assessment sessions

These sessions took place at the ICCAT Headquarters and the corresponding reports were presented to the SCRS. The stocks assessment sessions were held as follows:

September 28 to October 3	Swordfish
October 13 to 17	Albacore
October 26 to 30	Bluefin tuna-East
October 28 to 30	Other species

6.7 Sessions of the Standing Committee on Research and Statistics (SCRS)

These were held at the Hotel Pintor (Madrid) from November 2 to 6, 1992, and the corresponding report was presented to the Commission.

7. Meetings at which ICCAT was represented

7.1 Conference of CITES

This Conference of the Parties to the Convention on Trade in Endangered Species of Fauna and Flora (CITES) was held in Kyoto (Japan) on March 2-13, 1992.

The Government of Sweden had proposed to include western Atlantic bluefin tuna in Appendix I and eastern Atlantic bluefin tuna in Appendix II of the CITES Convention.

The ICCAT Secretariat, in collaboration with various scientists, prepared two pamphlets which explained the Commission's position concerning this matter and

which described, at the same time, the activities of the Commission. These pamphlets were distributed among the participants at the Conference. Mr. D. Silvestre, in representation of the ICCAT Chairman, and Mr. J. S. Beckett, as part of the Canadian Delegation, actively presented the ICCAT position. The reports of both representatives, as well as the decisions of the Conference, were presented to the Commission in Document COM/SCRS/92/14.

7.2 The XII "Week of Fisheries" of Azores

At the invitation of the Dr. A. Ribeiro Lima, the Executive Secretary attended, as an invited guest of the Regional Government, the meetings of the XII Week of Fisheries, held in the Azores Islands (Portugal) from March 16 to 20, 1992.

The program included numerous high-level conferences and discussions on current problems in fisheries, with many references to the biology and exploitation of tuna species. The interesting documentation obtained has been incorporated in the ICCAT library.

7.3 FAO Conference for the Adoption of a Draft Agreement for the Establishment of the Indian Ocean Tuna Commission

A first Conference having the same objective had been held in Rome in April, 1989, and concluded that other consultations were necessary before adopting such an Agreement. The main subjects under discussion referred to the legal aspect of the new Commission and to the degree of autonomy which should be given to the Commission within the framework of Article XIV of the FAO Constitution.

Further to that first Conference, FAO called a Technical Consultation in Rome (June, 1992) to review the revised draft of the Agreement. A new factor to be taken into account was relative to the acceptance of the European Economic Community as a member of FAO in November, 1991.

In response to the invitation from the Director-General of FAO, the Executive Secretary participated in the Technical Consultation as an observer. During this meeting, considerable modifications, of a technical and a juridical nature were introduced to the text of the initial draft. The Report of the Conference and the Text of the Agreement adopted was presented to the Commission in Document COM/92/27.

The FAO Council will consider the possible adoption of a final text of the Draft Agreement, once some matters of a juridical nature are resolved.

7.4 Coordinating Working Party on Atlantic Fishery Statistics (CWP)

The Fifteenth Session of the Coordinating Working Party on Atlantic Fishery Statistics (CWP) was held on July 8 to 14, 1992, at the NAFO Headquarters in Dartmouth, Nova Scotia (Canada). Representatives of EEC/EUROSTAT, ICES, NAFO, FAO, OECD, and SPC, as well as the Assistant Executive Secretary of ICCAT, participated in the meeting.

The CWP reviewed various common problems in collecting fishery statistics, particularly those relative to high-seas catches, and expressed concern about the discrepancies that exist among the data bases of the various Agencies. In this respect, it was recommended that ICCAT provide ICES with its tuna catch data by 1x1 or 5x5 areas, so that ICES can compile these data by their own statistical areas.

Continuing the tradition established to rotate the hosting of CWP Sessions, an invitation was accepted from the ICCAT representative to hold the Sixteenth Session of the CWP in Madrid in June, 1994, subject to the approval of the Commission. The dates and duration of this meeting will be decided at the ad hoc Consultation to be held in Dublin (Ireland) in 1993, in conjunction with the ICES Statutory meeting. The Report of the Fifteenth Session of the CWP was presented in Document SCRS/92/7.

7.5 FAO Technical Consultation on High Seas Fishing

During its Twenty-Sixth Session held in November, 1991, the FAO Conference decided to hold a Technical Consultation on High Seas Fishing, in view of the increasing importance that this matter has acquired on an international level.

The general objective of the Consultation was to obtain technical information for use in the appropriate management of high seas fishing. The Consultation met in Rome from September 7 to 15, 1992. In response to an invitation from the Director-General of FAO, the Executive Secretary participated in the Consultation in an observer capacity. The meeting dealt with four broad subject areas:

- -- Statistics and research
- -- Management (responsible fishing practices; new concepts and techniques)
- -- Institutions and legal framework
- -- Participation of developing countries

The final report of the Technical Consultation, whose text was adopted by consensus, was presented as Document COM-SCRS/92/19. The contents of this report could serve as a basis for the discussions on high seas fishing to take place over the next few months, in particular, at the Intergovernmental Conference to be held by the United Nations on this matter, as well as for the preparation of a code of conduct concerning responsible fishing.

8. Coordination of research

The Secretariat's Report, which is included later in this Biennial Report, summarizes the activities in coordination of research and the biostatistical activities, relative to tunas and tuna-like species in the Convention area.

9. ICCAT prizes for tag recoveries

The annual lottery to award prizes to participants in the ICCAT International Cooperative Tuna and Billfish Tagging Program was held at the Commission Headquarters on June 16, 1992. A total of three US$ 500 prizes were awarded for the drawing, corresponding to the following three groups:

- -- Tropical tunas (140 recovered tags were entered in the lottery)
- -- Temperate tunas (201 tags were entered)
- -- Billfish (99 tags were entered)

The three prizes corresponded to U.S. fishermen.

10. Collaboration with other countries and organizations

10.1 Collaboration with non-Contracting Parties

As in previous years, the Secretariat has maintained frequent contact, mainly by correspondence, with non member countries that are interested in tuna and tuna-like fisheries, exchanging information and statistical data on catch and effort, and transmitting invitations to participate in meetings organized by ICCAT, as well information on other matters relative to the Commission's activities. Among the countries that collaborate, at least partially, in the objectives of ICCAT, the following are noteworthy: Algeria, Argentina, Barbados, Bermuda, Croatia, Cuba, Cyprus, Dominican Republic, Greece, Italy, Malta, Mexico, St. Helena, St. Lucia, Senegal, Taiwan, Tunisia, Turkey, and the United Kingdom.

Throughout 1992, several non-member countries and organizations demonstrated a particular interest in knowing more about ICCAT's activities, with a view to possible membership in the Commission, specifically: Algeria, Argentina, Cameroon, Croatia, El Salvador, Libya, Mexico, Nigeria, Sierra Leone, Tunisia, and Turkey. The exchange of information with the fishing authorities of Taiwan continues being very constructive.

Throughout the year information relative to the following subjects was sent to the Governments of non-Contracting Parties and intergovernmental organizations:

- -- Management recommendations on bluefin tuna
- -- Resolution on catches of bluefin tuna by non-Contracting Parties
- -- Invitation to participate in the Working Group in Tokyo
- -- Need to transmit statistics on tuna catches
- -- Results of the Conference of Plenipotentiaries held in Madrid
- -- Invitation to participate as observers in the annual meetings of ICCAT and its auxiliary bodies

Document COM/92/22 presented to the Commission provided details on the above activities.

10.2 Collaboration with FAO

As usual, a close working relationship was maintained with diverse departments of FAO, within the framework of the Agreement adopted in 1973, as regards statistical, administrative, and juridical matters. Dr. D. Fadda, of the FAO Legal Department, served as an advisor to the ICCAT Conference of Plenipotentiaries held in June, 1992. He has also collaborated in the preparation of the Draft of the new ICCAT Staff Regulations and Rules. Of special note is the continued collaboration with the Statistics Department (FIDI) and with the Fisheries Department

and the GFCM Secretary, in the organization of the Second Joint GFCM/ICCAT Consultation.

10.3 Collaboration with other organizations and entities

Contact has been maintained and information exchanged with staff of the Commission of the European Community. Communication on a more regular basis was also established with the United Nations to provide periodically information of an administrative nature, and with the Division of Oceanic Affairs and the Law of the Sea (DOALOS) for juridical information.

Relations with CARICOM, and in particular, with its Fisheries Research and Management Program (CFRAMP) have increased during the year.

Collaboration with the Inter-American Tropical Tuna Commission (IATTC) has continued satisfactorily, exchanging information on tunas and obtaining data on biological sampling from Venezuelan catches in the Atlantic.

On the other hand, the Secretariat has maintained correspondence with diverse communications media to transmit updated information on the bodies and activities of ICCAT. Among these are: "The New York Times" (Paris correspondent), the "International Directories" (London), the "Yearbook of International Organizations" (Brussels), the "Canadian Almanac Directory" (Ontario), the "Europe World Yearbook" (London), etc.

11. Publications

In 1992, the Secretariat published and distributed the following publications:

1) Collective Volume of Scientific Papers, Vol. XXXVIII

This Volume contains the Report of the Working Group on Western Atlantic Tropical Tunas, held in Miami, Florida (U.S.A.) in April, 1991, as well as scientific papers presented at that meeting.

When published:	April, 1992
No. of pages:	285
No. of copies:	350

2) Collective Volume of Scientific Papers, Vol. XXXIX (No. 1)

This Volume contains the scientific papers presented at the 1991 SCRS Meeting on tropical species, albacore, small tunas and on the environment.

When published:	May, 1992
No. of pages:	389
No. of copies:	350

3) Collective Volume of Scientific Papers, VOL. XXXIX (No. 2)

This Volume contains the scientific papers presented at the 1991 SCRS Meeting on swordfish.

When published:	May, 1992
No. of pages:	250
No. of copies:	350

4) Collective Volume of Scientific Papers, Vol. XXXIX (No. 3)

This Volume contains the scientific papers presented at the 1991 SCRS Meeting on billfishes and bluefin tuna.

When published:	July, 1992
No. of pages:	250
No. of copies:	350

5) Data Record, Vol. 33

This Volume contains the majority of the biological data and catch and effort data on tunas and tuna-like species, received at the Secretariat up to February 29, 1992.

When published:	May, 1992
No. of pages:	410
No. of copies:	325

6) Biennial Report, 1990-91, Part II (1991)

This Report describes the Commission's activities during the second half of the 1990-1991 biennial period. It contains the reports of the Twelfth Regular Meeting of the Commission (Madrid, November 1991)

as well as the reports of the Panels, Standing Committees, Sub-Committees, and Working Groups. The Biennial Report also includes a summary of the activities of the Secretariat and national reports which describe the status of the tuna fisheries of the Contracting Parties.

When published:	June-July, 1992
No. of pages:	English: 294; French: 309; Spanish: 320
No. of copies:	1,075 (total of the 3 languages)

7) Statistical Bulletin, Vol. 21

This Volume includes the statistics available up to 1990 on catches of tunas and tuna-like species at the end of each year, by species, countries, areas and fisheries in the Atlantic Ocean.

When published:	July, 1992
No. of pages:	173
No. of copies:	500

In order to cut costs, all these publications were prepared, reproduced, and published at the Secretariat, except for the covers and the binding. Distribution of the "Collective Volume" and "Data Record" series is limited to scientists and institutes directed involved in research on tunas and tuna-like species.

On the other hand, three issues of the ICCAT "Newsletter" were published and distributed, in April, July, and December, 1992. The number of copies of the "Newsletter" is about 1,000.

For reasons of economy, the number of copies of each publication has been reduced to a minimum, and distribution is usually by surface mail with reduced mail rates.

12. Secretariat and Administration

Mrs. Glenda Stephens has presented, with the required three-months' advance notice, her resignation as a multi-lingual secretary (GS-5) at the Secretariat, effective December 15, 1992. The current staff of the Secretariat is as follows: the Executive Secretary (D-1), the Assistant Executive Secretary (P-5); the Systems Analyst (P-2), five multi-lingual secretaries (three GS-6 and two GS-5), a statistical secretary (GS-4), a Clerk (GS-1), and four locally-contracted staff.

1992 FINANCIAL REPORT
COM/ 92/ 9 (Revised)*

AUDITOR'S REPORT - FOR FISCAL YEAR 1991

The Auditor examined the books and accounts of the Commission at the close of Fiscal Year 1991. In accordance with Articles 9-3 and 12-7 of the Financial Regulations, and following a recommendation of the Council at its Second Regular Meeting, the Executive Secretary distributed a copy of the Auditor's Report to all the member country governments in March, 1992. The final Balance Sheet for Fiscal Year 1991 from the Auditor's Report was included in the "Report for Biennial Period, 1990-91 Part II".

Statement 1 shows the status of Cash and Bank (in U.S. dollars and Pesetas) at the close of Fiscal Year 1991. At that time there was a cash balance of US$ 216,942.96 (21,694,296 Pts.) which included an advance of US$ 3,683.50 (368,350 Pts.) by Gabon. This statement also shows the extrabudgetary funds of US$ 13,636.09 (1,363,609 Pts.) corresponding to the Albacore Research Program. The remaining US$ 199,623.37 (19,962,337 Pts.) corresponds to the cash balance of the Working Capital Fund.

At the close of Fiscal Year 1991 there were overdue contributions totaling US$ 722,116.51 (72,211,651 Pts.).

The exchange rate applied to convert the U.S. dollar amounts to pesetas was US$1 = 100 Pts.

FINANCIAL STATUS OF THE FIRST HALF OF THE BIENNIAL BUDGET - FISCAL YEAR 1992

At the Twelfth Regular Meeting (Madrid, November, 1991) it was decided that the budget and member-country contributions would be established in convertible pesetas to avoid many of the difficulties caused by the fluctuating exchange rate. Since the beginning of 1992, the accounting ledgers and financial tables are also in pesetas. As Fiscal Year 1991 closed with an exchange rate of 100 pesetas/U.S. dollar, the 1992 ledgers were opened using this same base exchange rate (See *Statement 1*). In 1992, all financial operations concerning dollars were recorded in pesetas using the monthly official U.N. exchange rate.

The Regular Budget for 1992 was approved by the Commission at its Twelfth Regular Meeting (Madrid, November 1991). (See Annex 15 to the Biennial Report, 1990-91, Part II, 1991).

The *General Balance Sheet* (attached herewith) shows the Assets and Liabilities at the close of Fiscal Year 1992.

Statement 2 shows the status of the contribution commitments of each of the Contracting Parties at the close of Fiscal Year 1992.

Of the total approved budget (125,840,000 pesetas), income received towards 1992 contributions totalled 90,141,762 pesetas at the close of Fiscal Year 1992. As of that time, only 10 of the 22 Contracting Parties had paid their 1992 contributions in full (Canada, Côte d'Ivoire, France, Gabon, Japan, Korea, Portugal, South Africa, Spain, and United States). Two countries (Brazil and Uruguay) made partial payment but still had a portion of their 1992 contributions pending.

At the close of Fiscal Year 1992, ten Contracting Parties (Angola, Benin, Cape Verde, Equatorial Guinea, Ghana, Republic of Guinea, Morocco, Federation of Russia, Sao Tomé and Principe, and Venezuela) had not paid any amount towards their 1992 contributions and seven of these countries had debts pending from other years as well.

The Republic of Guinea was not included in the table of contributions approved by the Commission because at the time of calculation of the contributions, ICCAT had not been informed by FAO that this country had filed an instrument of adherence. On January 9, 1992, and in accordance with Regulation 4.4 of the Financial Regulations, the amount of 800,000 pesetas was calculated as the Republic of Guinea's contribution for 1992, which, when paid, will be credited to the Working Capital Fund.

*The Financial Report presented at the 1992 Commission Meeting was updated to the close of Fiscal Year 1992.

The contributions towards the 1992 Regular Budget which are pending payment from the aforementioned ten Contracting Parties total 35,698,238 pesetas, which represent 28.4 percent of the total budget. This figure is indicative of the difficulties of these Contracting Parties in honoring their financial commitments to the Commission. What is even more indicative is the accumulated debt owed to the Commission, which amounted to 99,345,289 pesetas as of the close of Fiscal Year 1992.

Statement 3 shows the liquidation of the 1992 Regular Budget and a breakdown of expenditures, by budget chapter, to the close of the Fiscal Year. The total expenditures amounted to less than the total budget, mainly due to the restrictions imposed by the lack of cash flow, and which prevented having carried out all the activities foreseen for 1992.

Some general comments, by budget chapter, are as follows:

Chapter 1 - **Salaries:** The salaries, pension, and social security expenses of 12 staff members were charged to this chapter, which showed a negative balance of 797,792 pesetas, due to the increased cost of Spanish Social Security for locally-contracted staff.

Chapter 2 - **Travel:** Expenses pertaining to the Executive Secretary's participation in the Conference for the Establishment of an Indian Ocean Tuna Commission (Rome-June, 1992) as well as his participation in the Technical Consultation on High Seas Fishing (Rome-September, 1992) were included.

Chapter 3 - **Commission Meeting:** Expenditures remained within the amount budgeted.

Chapter 4 - **Publications:** The production costs of Commission publications shown in the Administrative Report were charged to this budget chapter. All work, except for the printing of covers and binding, was done by the Secretariat.

Chapter 5 - **Office Equipment:** Expenditures charged to this chapter included the cost of some furniture purchased. The positive balance is due to the restriction imposed on purchases because of the lack of cash on hand.

Chapter 6 - **Operating Expenses:** This chapter reflects the expenses incurred in the normal operation of the office in Fiscal Year 1992.

Chapter 7 - **Miscellaneous:** Minor expenses of a miscellaneous nature were charged to this chapter.

Chapter 8 - **Coordination of Research**

a) *Salaries*: The balance of this sub-chapter remained below the amount budgeted since the programmer's position, vacant since August, 1991, was not filled, due to the lack of cash flow.

b) *Travel to improve statistics:* Charged to this sub-chapter were the trip expenses for Secretariat participation in the Data Preparatory Meeting for Southwest Atlantic Fisheries, (Recife, Brazil-July, 1992), the Coordinating Working Party (Dartmouth-Nova Scotia, July, 1992), the Second ICCAT Billfish Workshop (Miami, Florida-July, 1992), and the Joint GFCM/ICCAT Expert Consultation (Iraklion, Crete-September, 1992).

Also charged to this sub-chapter were the extra-budgetary expenses (1,838,246 pesetas) related to two ICCAT meetings held in Tokyo in May, 1992.

It should be noted that half of the trip expenses (218,316 Pts.) for the participation of two members of the Secretariat at the Billfish Workshop (Miami-July, 1992) were paid for by the Program for Enhanced Research for Billfish.

c) *Port Sampling:* In addition to the port sampling expenses charged to this sub-chapter, the cost of the tags purchased was also included.

d) *Biostatistical Work:* Two ICCAT lottery prizes were charged to this sub-chapter.

e) *Electronic Equipment:* Expenditures charged to this sub-chapter included the purchase of accounting software ("Navision"), font cards, a new voltage stabilizer for the main-frame office computer (MICRO VAX II), and repairs to an existent stabilizer.

f) *Data Processing:* The majority of the expenditures charged to this sub-chapter were for computer equipment maintenance contracts and computer materials. Expenses for the electronic mail service were also charged to this sub-chapter.

g) *Scientific Meetings:* Expenditures remained within the amount budgeted.

h) Miscellaneous: The extra-budgetary expenses related to ICCAT's participation in the CITES Conference in Kyoto, as well as the printing costs and shipping of brochures and documents to Kyoto were charged to this sub-chapter.

Conference of Plenipotentiaries: Funds totalling 2,600,000 pesetas had been allocated in 1992 to cover the cost of the Plenipotentiary Conference held in

Madrid, June, 1992. The cost was considerably less than budgeted due to the generosity of the Government of Spain in assuming the expenses for the main meeting room and a work room for the Secretariat.

Statement 4 shows the total income received in 1992, which amounted to 113,072,950 pesetas, from member country contributions paid in 1992 towards the 1992 Budget, contributions paid in 1992 towards previous budgets, other extrabudgetary income received in 1992, and advances on future contributions received in 1992. Some details on income received in 1992 (extrabudgetary) are as follows:

a) Other income - (Extrabudgetary) - Voluntary contributions

Due to unforeseen expenditures related to the two ICCAT meetings held in Tokyo in accordance with the decision by the Commission, the CITES Conference in Kyoto, and the Second GFCM/ICCAT Expert Consultation in Crete, the Executive Secretary anticipated the need for extrabudgetary funds and distributed a circular requesting voluntary contributions on April 8, 1992. The following voluntary contributions, credited to the Working Capital Fund, were received:

- Federation of Japan Tuna Fisheries, Tokyo, Japan: 1,830,099 pesetas
- Governo Regiao Autónoma dos Açores, Portugal: 801,865 pesetas
- Sea Fisheries Directorate, South Africa: 90,000 pesetas

These three voluntary contributions (2,721,964 pesetas), were used to offset partially the extrabudgetary expenses (2,933,902 pesetas) for ICCAT's participation in the CITES meeting in Kyoto and the Secretariat's participation in the two ICCAT meetings in Tokyo.

Other voluntary contributions were received from observers at ICCAT meetings and from:

- The European Economic Community, via the Institute of Marine Biology of Crete (142,450 Pts.), to apply towards travel expenses of Secretariat personnel to attend the Second Joint GFCM/ICCAT Expert Consultation on Large Pelagic Fisheries in Crete, Greece.
- The Program for Enhanced Research for Billfish (215,072 Pts.), to apply towards travel expenses of Secretariat staff to attend the Second Billfish Workshop in Miami, U.S.A.

b) *Other income - (Extrabudgetary) received in Fiscal Year 1992*

In 1992, other extrabudgetary income was also derived from bank interest, the refund of Value Added Tax, reimbursement for publications, the difference in currency exchange, reimbursement from IATTC for the mailing of books, and, in particulr, from:

- The Program for Enhanced Research for Billfish, 218,000 pesetas. This amount was foreseen in the Billfish Research Program Budget to help defray operating expenses of the Secretariat resulting from Billfish Research Program activities.

Statement 5 presents the composition and balance of the Working Capital Fund for Fiscal Year 1992. Following the receipt of the late payment of the 1992 contributions from Portugal and France, the Fund showed a positive balance of 11,728,190 pesetas at the close of Fiscal Year 1992 (a decline of 41.2 percent with respect to 1991).

Statement 6 shows the cash flow during Fiscal Year 1992, i.e., a summary of income and expenditures.

Statement 7 shows the status of Cash and Bank at the close of Fiscal Year 1992. There was a positive balance of 19,865,154 pesetas. This positive balance would be considerably less if the 6,773,355 pesetas received in advance contributions from Côte d'Ivoire, Gabon, and Japan were discounted.

As noted earlier in this report, the accumulated debt owed to the Commission for overdue contributions amounts to 99,345,289 pesetas at the close of Fiscal Year 1992.

ALBACORE RESEARCH PROGRAM FUNDS

At the 1990 Commission meeting, it was decided that the balance in sub-chapter 8-i (Albacore Research Program) which amounted to US$ 15,052.51, would be kept in a special fund, to be used exclusively for this Program. At the start of Fiscal Year 1992, there was a balance of 1,363,609 pesetas. No expenses were charged to this Program in 1992. Hence, the balance remained the same at the close of the Fiscal Year.

PROGRAM FOR ENHANCED RESEARCH FOR BILLFISH

The special fund (established in U.S. dollars) to administer the Billfish Research Program was created in 1987. All deposits and expenditures for the Billfish Program are made in U.S. dollars. For accounting purposes, the Billfish Program Funds are shown in the Commission's General Balance Sheet in pesetas, in accordance with accepted accounting procedures. Hence, the status of these funds (in Fiscal Year 1992) was as follows:

	US $
Balance at start of FY 1992	$1,104.77
Deposits in 1992	$41,889.65
Total cash available	$42,994.42
Expenditures	$36,989.38
Balance (at the close of FY 1992)	$6,005.04

The balance of Billfish Program funds at the close of Fiscal Year 1992 (US$ 6,005.04) was converted to pesetas, for accounting purposes, at an exchange rate of 115 pesetas to 1 US$. Hence, the balance, in pesetas, amounted to 690,580 Pts. (See *General Balance Sheet*)

BLUEFIN YEAR PROGRAM (BYP)

This Program was approved by the Commission in 1991 and began in 1992. However, the Program did not require any funding in 1992 by the Commission nor the establishment of special funding such as that required by the Billfish Program.

FINAL COMMENTS

The final commentary by the Executive Secretary included in the 1991 Financial Report described as "eternal" the problem of timely payment of financial contributions by the Contracting Parties to the ICCAT budget, and expressed the hope that the financial situation of the Commission would improve in 1992.

The information in the present report clearly shows that this improvement has not yet occurred and has led to increasing difficulties for the Secretariat to meet the responsibilities and commitments of the Commission as reflected in the budget approved for 1992.

With 45 percent of the 1992 budgeted contributions still not received two months before the end of the year, and in order to maintain the activities of the Secretariat at a minimum, it was necessary to use all the funds available in the Working Capital Fund as well as all other extrabudgetary contributions received. Since foresight is sound management, it seemed appropriate to foresee a mechanism to cover the possible deficits in Cash and Bank. In this respect, it should be recalled that at the Third Regular Meeting (Paris, 1973), the Commission adopted a recommendation made by the STACFAD to authorize the Executive Secretary to seek a short-term bank loan, if it became absolutely necessary. The Executive Secretary consulted the two banks where the Commission maintains accounts concerning the possibility of their provide short-term loans to meet the financial necessities of ICCAT until these can be covered by the normal sources of financing. Such loans would be guaranteed by the decisions of the Commission relative to the financing of the 1993 Budget and previous budgets, and they can be obtained by underwriting a policy to open a line of credit, for which the explicit authorization of the Commission is required. The amounts used by ICCAT and charged to this line of credit would be at the annual interest rates prevailing at the time of the loan (which were about 16 percent per annum for a loan in pesetas and 6 percent per annum for a loan in U.S. dollars, at the time the consultation was made).

In November, 1992, the Commission adopted a Resolution authorizing the Executive Secretary to underwrite a policy to open a line of credit (see Appendix 2 to Annex 13 to the 1992 Proceedings).

GENERAL BALANCE SHEET (AT CLOSE OF FISCAL YEAR 1992) (PESETAS)

ASSETS		
Available:		Pts.
-- Banco Exterior de España:		
Acct. 030-31279.43-E (US$)	$542.68	62,408
Acct. 030-17672.60A (Pts.)		2,619,026
Acct. 030-17329.75-F (Conv.Pts.)		16,140,300
-- Bankinter:		
Acct. 16.10096.2 (Pts.)		986,586
Acct. 15.030009.7 (US$)	$51.46	5,918
Cash on hand (Pts.)		50,916
Total Available (Pts.)		19,865,154
(Exchange rate: 1US$ = 115 Pts.)		
Available in Billfish Trust Fund:		
Acct. 030-31555.90-B (US$)	$6,005.04	690,580
Receivables:		
Overdue contributions		99,345,289
Fixed Assets:		
Acquired before 1992	37,694,600	
Acquired during 1992	764,240	
Retired during 1992	- 6,209,189	
Total Fixed Assets, in use	32,249,651	
Accumulated depreciation	- 22,179,150	
Fixed Assets (net)		10,070,501
Guaranty deposit		81,564
TOTAL ASSETS		**130,053,088**

LIABILITIES	
	Pts.
Acquired holdings (net)	10,070,501
Guaranty deposit	81,564
Balance in the Working Capital Fund	11,728,190
Balance in Albacore Research Program Funds	1,363,609
Balance in Billfish Trust Fund	690,580
Advances on future contributions received in 1992	6,773,355
Accumulated pending contributions	99,345,289
TOTAL LIABILITIES	**130,053,088**

STATEMENT 1

Status of Cash and Bank at the close of Fiscal Year 1991 (in US $ and Pesetas *)

	SUMMARY		*BREAKDOWN*				
	US $	Pts.				US $	Pts.
Balance in Cash and Bank	216,942.96	21,694,296	Cash Balance in Working Capital Fund			199,623.37	19,962,337
			Albacore Research Program Funds			13,636.09	1,363,609
			Advance by Gabon			3,683.50	368,350
	216,942.96	21,694,296				216,942.96	21,694,296
Overdue contributions	722,116.51	72,211,651	Accumulated pending contributions:			722,116.51	72,211,651
				US $	Pts.		
			a) from 1985 & before	60,084.85	6,008,485		
			b) from 1986	53,156.00	5,315,600		
			c) from 1987	70,869.00	7,086,900		
			d) from 1988	95,874.00	9,587,400		
			e) from 1989	88,941.00	8,894,100		
			f) from 1990	133,790.00	13,379,000		
			g) from 1991	219,401.66	21,940,166		

* Exchange rate applied: US$ 1 = 100 Pts.

STATEMENT 2

Status of Member Country Contributions to the Regular Budget (Pesetas) (at the close of Fiscal Year 1992)

Country	*Past due at the start of Fiscal Year 1992*	*1992 Member Country contributions*		*Contributions paid in 1992 and applied towards the 1992 Budget*		*Contributions paid in 1992 towards previous budgets*	*Balance due at the close of Fiscal Year 1992*
Angola	2,476,800	2,418,183		0		0	4,894,983
Benin	5,812,170	827,184		0		0	6,639,354
Brasil	8,481,800	5,281,748		91,500		8,481,800	5,190,248
Canada	0	3,220,034		3,220,034		0	0
Cap Vert	5,194,400	2,178,793		0		0	7,373,193
Côte d'Ivoire	0	3,272,624		3,272,624	(1)	0	0
España	0	29,296,667		29,296,667		0	0
France	0	13,721,426		13,721,426		0	0
Gabon	0	1,536,889		1,536,889	(2)	0	0
Ghana	27,536,127	7,766,880		0		0	35,303,007
Guinea Ecuatorial	2,315,500	821,363		0		0	3,136,863
Japan	0	12,223,890		12,223,890	(3)	0	0
Korea	0	4,729,076		4,729,076		0	0
Maroc	2,000	2,772,341		0		0	2,774,341
Portugal	2,200	6,579,248		6,579,248		2,200	0
Russia	0	5,052,610		0		0	5,052,610
Sao Tomé & Principe	0	1,580,547		0		0	1,580,547
South Africa	0	2,428,173		2,428,173		0	0
United States	0	12,243,470		12,243,470		0	0
Uruguay	880,600	837,503		798,765		880,600	38,738
Venezuela	889,666	7,051,351		0		0	7,941,017
Sub-total	53,591,263	125,840,000		90,141,762		9,364,600	79,924,901
Guinea (Rep. of)	0	800,000	(4)	0		0	800,000
Cuba (5)	11,034,300	0		0		0	11,034,300
Senegal (6)	7,586,088	0		0		0	7,586,088
TOTAL	72,211,651	126,640,000		90,141,762		9,364,600	99,345,289

(1) There is an advance by Côte d'Ivoire of 5,124,245 Pts. which will be applied to future contributions of Côte d'Ivoire.
(2) Includes an advance in 1991 (368,350 Pts.) applied towards 1992. There is also an advance in 1992 (501,580 Pts.) which will be applied to future contibutions of Gabon.
(3) There is an advance by Japan of 1,147,530 Pts. which will be applied to future contributions of Japan.
(4) As a new member (effective January 1, 1992), the Republic of Guinea was not included in the contributions budgeted for 1992. However, according to rule 4.4 of the Financial Regulations, the 1992 contribution of the Republic of Guinea was calculated to be 800,000 Pts. (which, upon payment, will be applied to the Working Captial Fund).
(5) Cuba withdrew from the Commission, effective December 31, 1991.
(6) Senegal withdrew from the Commission, effective December 31, 1988.

STATEMENT 3

Liquidation of Budgetary and Extrabudgetary Expenditures (Pesetas) (at the close of Fiscal Year 1992)

Chapters		*1992 Budget*	*Expenditures at the close of Fiscal Year 1992*	
Chapter 1.	Salaries	68,016,000	68,813,792	
Chapter 2.	Travel	1,040,000	664,890	
Chapter 3.	Commission Meeting	5,200,000	3,915,894	
Chapter 4.	Publications	3,120,000	2,713,682	
Chapter 5.	Office Equipment	728,000	316,377	
Chapter 6.	Operating Expenses	9,568,000	8,673,550	
Chapter 7.	Miscellaneous	520,000	532,548	
Sub-total Chapters 1-7		88,192,000	85,630,733	
Chapter 8.	Statistics and Research:			
	8A Salaries	19,760,000	14,216,388	
	8B Travel to improve statistics	1,040,000	3,380,393	*
	8C Port Sampling	1,560,000	55,535	
	8D Biostatistical Work	1,248,000	103,020	
	8E 8E Electronic Equipment	1,560,000	841,697	
	8F Data Processing	3,952,000	3,194,894	
	8G Scientific Meetings (including SCRS)	5,928,000	5,284,601	
	8H Miscellaneous	0	1,095,656	**
	8I Albacore Research Program	0	0	
Sub-total Chapter 8		35,048,000	28,172,184	
Conference of Plenipotentiaries		2,600,000	1,099,175	
TOTAL EXPENDITURES		125,840,000	114,902,092	

* Including 1,838,246 pesetas in expenses related to two ICCAT metings in Tokyo. See related information in text.

** Expenses related to the CITES meeting in Kyoto were charged to this sub-chapter. See related information in text.

STATEMENT 4

Liquidation of Budgetary and Extrabudgetary Income (Pesetas) (at the close of Fiscal Year 1992)

1.1	*Contributions paid in 1992 towards the 1992 Budget:*				
	United States	(January 27, 1992)		12,243,470	
	Korea	(April 1, 1992)		4,729,076	
	Japan	(April 2, 1992)		12,223,890	
	Canada	(April 8, 1992)		3,220,034	
	España	(April 10, 1992)		29,296,667	
	Côte d'Ivoire	(April 15, 1992)		3,272,624	
	South Africa	(May 29, 1992)		2,428,173	
	Gabon	(July 6, 1992)		1,168,539	
	Uruguay	(July 6, 1992)		798,765	
	Brasil	(September 1, 1992)		91,500	
	Portugal	(November 5, 1992)		6,579,248	
	France	(December 18, 1992)		13,721,426	89,773,412
1.2	*Contributions paid in 1992 towards previous budgets:* *				
	Uruguay	(April 14, 1992)		880,600	
	Brasil	(September 1, 1992)		8,481,800	
	Portugal	(November 11, 1992)		2,200	9,364,600
1.3	*Other income (extrabudgetary) received in 1992:* *				
	Voluntary Contributions:				
	-- Federation of Japan Tuna Fisheries		1,830,099		
	-- Governo Regiao Autónoma dos Açores		801,865		
	-- Sea Fisheries Directorate of South Africa		90,000		
	-- Observers at ICCAT annual meetings		654,000		
	-- EEC-towards travel expenses (Crete)		142,450		
	-- Billfish Program-towards travel expenses (Miami)		215,072	3,733,486	
	Bank interest			835,267	
	Refund from VAT			1,214,721	
	Reimbursement for publications			32,177	
	Difference in currency exchange			1,076,245	
	Reimbursement from IATTC for mailing books			51,687	
	Billfish Program-towards operating expenses			218,000	7,161,583
1.4	*Advances on future contributions received in 1992:*				
	Japan	(April 2, 1992)		1,147,530	
	Côte d'Ivoire	(April 15, 1992)		5,124,245	
	Gabon	(July 6, 1992)		501,580	6,773,355
TOTAL INCOME RECEIVED IN 1992:					113,072,950

* To the Working Capital Fund.

STATEMENT 5

Composition and Balance of Working Capital Fund (Pesetas) (Fiscal Year 1992)

Cash Balance in Working Capital Fund (at start of Fiscal Year 1992)		19,962,337
Deposits:		
Contributions paid in 1992 towards previous budgets	9,364,600	
Other income (extrabudgetary) received in 1992	7,161,583	16,526,183
		36,488,520
Less:		
Amount to cover the difference between contributions paid in 1992 and applied towards the 1992 Budget (90,141,762 Ptas.) * and regular budgetary and extrabudgetary expenditures (Chapters 1-9) at the close of Fiscal Year 1992 (114,902,092 Ptas.)		- 24,760,330
Cash Balance in Working Capital Fund (at the close of Fiscal Year 1992)		11,728,190

* Includes an advance by Gabon (368,350 Pts.) in 1991 applied towards the 1992 contribution of Gabon.

STATEMENT 6

Cash Flow (during Fiscal Year 1992) (Pesetas)

INCOME			*EXPENDITURES*	
Balance in Cash and Bank (at the start of Fiscal Year 1992)		21,694,296 *	Total expenditures in Fiscal Year 1992 (Chapters 1 - 9)	114,902,092
Income:			Cash Balance in Working Capital Fund	11,728,190
Contributions paid in 1992 towards the 1992 Budget	89,773,412		Balance of Albacore Research Program Funds	1,363,609
Contributions paid in 1992 towards previous budgets **	9,364,600		Advances on future contributions received in 1992	6,773,355
Other income (extrabudgetary) received in 1992 **	7,161,583			
Advances on future contributions received in 1992	6,773,355	113,072,950		
TOTAL INCOME		134,767,246	TOTAL EXPENDITURES	134,767,246

* Includes an advance by Gabon (368,350 Pts.) in 1991 applied towards the 1992 contribution of Gabon.
** To the Working Capital Fund.

STATEMENT 7

Status of Cash and Bank at the close of Fiscal Year 1992 (Pesetas)

SUMMARY			*BREAKDOWN*		
Balance in Cash and Bank		19,865,154	Cash Balance in Working Capital Fund	11,728,190	
			Albacore Research Program Funds	1,363,609	
			Advances on future contributions received in 1992	6,773,355	
		19,865,154		19,865,154	
Overdue contributions:		99,345,289	Accumulated pending contributions:		99,345,289
Angola	4,894,983				
Benin	6,639,354		a) from 1986 and before	11,324,085	
Brasil	5,190,248		b) from 1987	7,086,900	
Cape Verde	7,373,193		c) from 1988	9,587,400	
Cuba	11,034,300		d) from 1989	8,894,100	
Ghana	35,303,007		e) from 1990	9,768,100	
Guinea Ecuatorial	3,136,863		f) from 1991	16,186,466	
Guinea (Rep. of)	800,000		g) from 1992	36,498,238	
Maroc	2,774,341				
Russia	5,052,610				
Senegal	7,586,088				
Sao Tomé & Principe	1,580,547				
Uruguay	38,738				
Venezuela	7,941,017				

REPORT ON STATISTICS AND COORDINATION OF RESEARCH IN 1992 COM-SCRS/ 92/ 10 (Revised)*

I. DATA COLLECTION AND SAMPLING

1. Collection of 1991 Statistics Through National Offices

Table 1 of the Report of the Sub-Committee on Statistics (Appendix 7 to Annex 14) shows the progress made by the national offices and by the Secretariat in the collection of 1991 statistics. At the time of the 1992 stock assessment sessions, data from the following major tuna fishing countries had not been received by the Secretariat, despite having sent many reminders by fax and E-mail:

Task I data (total nominal catches):

Argentina, Cape Verde, Italy (albacore), Japan (longline), Russia and Senegal.

Task II catch and effort data:

Angola, Argentina, Croatia, Cuba, Ghana, Japan (longline), Morocco (PS), Russia, South Africa, Spain (albacore)**, Turkey, Uruguay, and Venezuela (longline).

Task II size data:

Angola, Argentina, Cape Verde, Chi-Taiwan (only albacore received), Croatia, Cuba, Ghana, Morocco, Japan (longline), Portugal (only bigeye in Madeira received), Russia and South Africa.

2. Improvements and Pending Difficulties

a) Major improvements made in 1992

a-1) Southwest Atlantic data. During the Data Preparatory Meeting for the Southwestern Atlantic, held in Recife, Brazil, in July, 1992 (COM-SCRS/92/15), historical catch statistics were examined and corrected. Some of the data reported as round weight were found to be gilled-and-gutted weight and were modified accordingly. Also longline and baitboat data which had been reported on a national basis were separated by regions, as the catch composition (in species and size) is different according to the region. This made it easier to match the catch with the proper size data. Many new sets of size data for past years also became available during and after the session, and were included in the new data series for national longliners fishing from Rio Grande do Sul, as well as Santos-based longline billfish size data and Japanese-flag longliners in years for which the data had been missing. New historical series of catch and size data became available for *Scomberomorus spp.* for northern Brazil.

a-2) *Billfish data.* The Second Billfish Workshop held in Miami, Florida, U.S.A., in July, 1992, improved the billfish data base. During this session, catch data were reviewed. Among the many improvements made, the most important achievement was that most of the sailfish catches reported only for the entire Atlantic for Taiwan and Japan, were separated into east and west Atlantic. In addition, many new size data became available for Venezuela, Senegal and Brazilian catches.

---

* The Secretariat Report on Statistics and Coordination of Research presented at the 1992 Commission meeting was revised.
** The standardized CPUE index was provided on October 13, 1992.

One of the by-products of the Enhanced Billfish Research Program is that the at-sea sampling (observer program) on Venezuelan longliners produced some size data for other species (such as swordfish and albacore). These data were used to match the Venezuelan catches of these species.

a-3) Mediterranean statistics. Major improvements were made on Mediterranean statistics in 1992 as a result of the Second GFCM/ICCAT Expert Consultation on Stocks of Large Pelagic Fishes in the Mediterranean Sea, held in Crete, Greece, in September, 1992 (COM-SCRS/92/17). These improvements included updating catch statistics to 1990 and 1991. This is very important since the ICCAT data base was lacking those data for most of the countries. Many historical series of catch statistics were modified as well. The most important finding was that, for many countries, the catch reported in the past was not round weight but gilled-and-gutted weight. Therefore, considerable changes were made in the historical series. Several series of catch-per-unit-of-effort data and size data became available for Italian, Greek and Cypriot fisheries, particularly on bluefin and swordfish. During the session, the catch-at-size data base was created by the Secretariat and approved by the Consultation for Mediterranean swordfish and later for Mediterranean bluefin tuna.

a-4) *Timeliness of reporting Task I data.* Task I data from national sources were received in a more timely manner in 1992, due to the extra efforts by scientists to provide data for the various intersessional meetings. This made it possible to compile catch data with reasonably good coverage before these inter-sessional meetings (billfish, swordfish, GFCM/ICCAT Joint Consultation and albacore). The species catch tables for use at the 1992 SCRS sessions were distributed to the Rapporteurs in early October.

b) Pending difficulties

b-1) *Catch-at-size data.* Most of the major fishing countries for east Atlantic bluefin, north Atlantic swordfish and north Atlantic albacore presented catch-at-size data, although sometimes late. Often these data are not submitted until the stock assessment sessions. Consequently, the meeting participants have to delay their work while the Secretariat regenerated the catch at size, using these new data.

b-2) *Lack of detailed catch-and-effort data.* For many fisheries, Task II catch and effort are reported. However, many of these data are not submitted in the precise format established by ICCAT, which creates some difficulties for scientists in standardizing the CPUE series (e.g., most of the Mediterranean catch and effort series, including French bluefin purse seine data). In particular, there are no series of reliable abundance indices available for Mediterranean bluefin or swordfish.

b-3) *Lack of size data.* Proper size data are still lacking for some major fisheries, particularly for recent years (listed in Section I-1 of this Report) and this made it necessary to use substituted size data to update the catch at size for stock assessments. Although major improvements have been made on the Mediterranean data base, the lack of size data for many fisheries is still notable. In some cases, the data had been collected, but the national offices failed to transmit them to ICCAT.

3. Port Sampling by the Secretariat

Routine sampling from longliners at various transshipment ports was carried out as in the past by ICCAT. However, the sampling rate remained very low at ports in the Canary Islands and at St. Maarten.

II. SECRETARIAT DATA PROCESSING AND BIOSTATISTICAL WORK

1. Facilities

Although there is a need for some new equipment and software, and up-grading of the present Secretariat computer systems, no improvements were made to the current system, due to financial difficulties (lack of cash available for the budgeted items). The lack of high-speed processors, additional RAM, and SVGA monitors made it difficult for many scientists to run various assessment programs during the stock assessment sessions held at the ICCAT headquarters. This lack of proper computer facilities also caused problems for the Secretariat to carry out its preparatory work before these stock assessment sessions and during these sessions as well.

2. Data Processing and Biostatistical Work

The vacant programmer position has not yet been filled. A notice of vacancy was distributed in April and

some applications were received. However, the position has not yet been filled due to the shortage of cash. Because of a very busy intersessional meeting schedule in 1992 and reduced staff, the Secretariat staff had a considerable extra work load, and concentrated on completing the priority items.

a) Extra statistical work and data processing

The Secretariat's work for the intersessional meetings held in 1992 (see list in Section III of this report) included the following:

- -- preparing catch tables
- -- preparing data catalogues
- -- writing various reports on the status of statistics, data base, etc.
- -- preparing catch, catch and effort and size data bases and updating them during the sessions
- -- creating catch-at-size bases using substitutions and raising
- -- preparing catch-at-age data
- -- providing computer support during the meetings
- -- preparing catch and effort indices
- -- preparing graphics and tables for the meeting reports
- -- checking the results of analyses after the sessions, and editing the reports

b) Routine work

The volume of routine work increased as the volume of data increased. Routine work included entering, verifying and processing all the catch, catch and effort and biological data, updating the data catalogue and tagging file for recent years, and preparing and providing data files for scientists who requested specific data. The data processing for all the ICCAT statistical publications was also done.

c) Coordination of the Program of Enhanced Research for Billfish, the Albacore Research Program and the Bluefin Year Program

The Secretariat, in collaboration with the Coordinators of these research programs, was involved in the coordination, administration of funds, and preparation of data for the research activities.

d) The 1992 tuna tagging lottery (for tag recoveries reported in 1991)

Details are reported in the Administrative Report.

3. Need for Software at the Secretariat

According to the recommendations made in 1991 by the Sub-Committee on Statistics and SCRS and endorsed by the Commission, the Secretariat circulated a memorandum asking the scientists to indicate the software necessary at the Secretariat. Very few responses were received and mostly all the software that was suggested by the scientists is already installed at the Secretariat. Nevertheless, some of the software requested cannot be run with the present hardware at the Secretariat.

During the SCRS session, further discussion was held by the Sub-Committee on Statistics on the software needed at the Secretariat, particularly ASPIC, a revised version of ADAPT, and STAAT. The scientists concerned agreed to provide these aforementioned programs to the Secretariat. However, as of the end of the year these were not yet provided.

4. Shark Statistics and Fishery Description

A circular was distributed to all the pertinent scientists as a reminder of the decision by the Commission at its 1991 meeting concerning the collection of information and statistics on the shark fishery. A few responses as well as some literature on shark identification and shark statistics were received by the Secretariat. Some papers relating to sharks were submitted to the 1992 SCRS.

III. MEETINGS AND OTHER ASSIGNMENTS

The intersessional meetings relating to SCRS activities are reported in the Administrative Report. Those meetings included:

- -- Working Group to Develop Technical Details for the Implementation of the ICCAT Resolution on Catches by Non-Contracting Parties (COM\92\25)
- -- Data Preparatory Meeting for the Southwestern Atlantic (COM-SCRS\92\15)

- -- Second ICCAT Billfish Workshop (COMSCRS\92\16)
- -- Coordinating Working Party on Atlantic Fishery Statistics (SCRS\92\7)
- -- Second GFCM/ICCAT Expert Consultation on Stocks of Large Pelagic Fishes in the Mediterranean Sea (COM-SCRS\92\17)
- -- Management Review Committee

The Secretariat also provided technical, statistical, and secretarial support during all the meetings related to the SCRS (in the intersessional period and during the SCRS meeting) which included the following:

- -- Stock Assessment Sessions (Albacore, Swordfish, Bluefin-East, Southern Bluefin, Bigeye, Yellowfin, Skipjack, Billfish, and Small Tunas)
- -- Sub-Committee on Statistics
- -- Sub-Committee on Environment

The proposal by Sweden to include bluefin tuna in the Appendices of CITES generated considerable additional work. The Secretariat, in collaboration with several national scientists, prepared pamphlets and other materials for the ICCAT booth at the CITES Conference, in order to explain the scientific findings of the SCRS.

The recommendation made by the Sub-Committee on Environment and the SCRS, endorsed by the Commission, to identify centers that have environmental data bases was followed up. A circular was distributed, and with the help of the national scientists, a few centers were identified. These centers will be contacted in 1993 to investigate the possibility of the Commission having access to these data bases.

IV. PUBLICATIONS

Details on the scientific publications issued in 1992 are reported in the Administrative Report.

CHAPTER II

RECORDS OF MEETINGS

PROCEEDINGS OF THE EIGHTH SPECIAL MEETING OF THE COMMISSION

Madrid, November 9-13, 1992

FIRST PLENARY SESSION
November 9, 1992

Item 1. Opening of the meeting

1.1 The Eighth Special Meeting of the Commission was held in Madrid, Spain, at the Hotel Pintor on November 9-13, 1992, and was chaired by Dr. A. Ribeiro Lima (Commission Chairman). He introduced the people seated at the head table: Dr. J. Loira (Secretary General of Maritime Fisheries of Spain), Mr. K. Shima (First Vice Chairman of the Commission), Dr. J. L. Cort (SCRS Chairman), Dr. A. Fernández (ICCAT Executive Secretary) and Dr. P. M. Miyake (ICCAT Assistant Executive Secretary).

1.2 Dr. Loira welcomed the participants and noted the events that had taken place since the 1991 Commission meeting, such as the incorporation of the new Executive Secretary, the meeting of the Working Group on Catches of Bluefin Tuna by Non-Contracting Parties, and the Conference of Plenipotentiaries held in Madrid to amend paragraph 2 of Article X of the Convention in order to be able to modify the system of calculating member country contributions. He also mentioned three other international meetings concerning the conservation of fish resources: the International Conference on Responsible Fishing, held in Cancún, Mexico, in May, the Meeting of the U.N. Conference on Environment and Development (UNCED) in Rio de Janeiro in June, and the Technical Consultation on Fishing on the High Seas, in Rome, in September. All these meetings called for cooperation and for providing regional and multilateral fishery organizations with the means necessary for them to reach their objectives. Dr. Loira's address is attached in Annex 4.

1.3 The meeting was formally opened by Dr. A. Ribeiro Lima (Portugal), the Commission Chairman. He commented that 1992 had been particularly important for ICCAT and briefly reviewed the numerous meetings in which ICCAT had participated during the year. He also mentioned the Protocol adopted in 1984, which has been ratified by all but five countries, and he reported on his attempt to persuade these five countries to accelerate their ratification procedures. Dr. Lima expressed his concern for the financial situation of the Commission and asked that this matter be discussed very seriously and that solutions be found to this problem. The Commission Chairman's opening address is included in Annex 4.

Item 2. Adoption of Agenda, Arrangements for the Meeting and Appointment of Subsidiary Bodies

2.1 Dr. Antonio Fernández, in presenting the Agenda of the Commission Meeting, expressed his

pleasure at being able to address the Commission as Executive Secretary. He reviewed the Agenda and drew attention to the most important and new items which are in accordance with the decisions adopted by the Commission in 1991. He suggested postponing discussion of Item 7 until Thursday, November 12, when the representative of FAO, Dr. D. Fadda, can be present. The Executive Secretary reminded the participants of the critical financial situation of the Commission and stressed the necessity for adopting short-term decisions to help correct this situation. He referred briefly to the documentation prepared for this meeting by the Secretariat and to the extra workload the staff had in 1992 with the large number of meetings involving ICCAT. Dr. Fernández also noted the use of recycled paper this year, which is an attempt by the Secretariat to do its part in the conservation of natural resources.

2.2 The Agenda was adopted by the participants and is attached as Annex 1. The List of Commission Documents is attached as Annex 3.

Item 3. Introduction of Delegations

3.1 Each head delegate introduced his delegation. The names and addresses of all the members of the delegations are found in the List of Participants, attached as Annex 2.

3.2 In introducing his delegation, the Delegate of Russia made the following statement:

"On the 13th of January, 1992, the Ministry for Foreign Affairs of the Russian Federation dispatched a circular note to diplomatic representations on the Russian territory and to all the embassies and missions of Russia abroad, informing all the countries that the Russian Federation continues to realize the rights and execute the obligations in accordance with international agreements, signed by the Union of the Soviet Socialist Republics. That completely concerns multi-lateral international agreements, of which the former Soviet Union is member, i.e., the International Convention for the Conservation of Atlantic Tunas, which the U.S.S.R. joined in 1977. The Russian Federation will continue to realize the rights and execute the obligations connected with membership in ICCAT of the former Soviet Union as provided in Article 28 of its Constitution, in which it is stated that Russia will provide sufficient execution of obligations in accordance with commonly recognized norms and principles of international law and signed international agreements."

Item 4. Admission of Observers

4.1 The observers to this year's meeting, all of whom were formally invited by the Commission, were asked to introduce themselves; they were all admitted and welcomed by the Chairman. The Observers are also included in the List of Participants (Annex 2).

4.2 The Commission Chairman reported that a meeting of head delegates had been held in closed session on the admission of observers, particularly of non-governmental organizations. It was decided to create a Working Group to study and to present proposals to improve the criteria and set up a clear procedure for inviting and admitting observers. He suggested that Canada, Japan, Spain and the U.S.A. be members of this Working Group as well as any other country who would like to work on this subject.

Item 5. Review of Commission Membership

5.1 The membership of the Commission was reviewed. The Executive Secretary referred to the Administrative Report (COM/92/9) which describes the work done by the Secretariat this year. The first part of the Report reflects the Commission membership, officers, etc.

Item 6. Status of the Ratification of the Protocol of Amendment to the Convention (signed in Paris in 1984)

6.1 While presenting the Administrative Report, the Executive Secretary reported on the status of the ratification of the Protocol to amend the Convention. On May 15, 1992, the Director of FAO informed ICCAT that he had received the ratification of the Protocol from Canada. The Protocol will enter into effect when all Contracting Parties have deposited their ratification or acceptance. Up to now, seventeen member countries have officially ratified or agreed to the Protocol; however, ratification is still pending for

five countries: Benin, Côte d'Ivoire, Gabon, Morocco, and the newest ICCAT member, the Republic of Guinea. He reported that the Commission Chairman had sent a letter on March 27, 1992, urging these countries to ratify the Protocol.

6.2 The Delegate of Côte d'Ivoire informed that his country had ratified the Protocol. Instructions have been given to Ministry of Foreign Affairs to submit this information to FAO, depositary of the ICCAT Convention. Although this has not yet been done, the corresponding decree was published in the Official Journal of Côte d'Ivoire, March 19, 1992. A copy was presented to the Executive Secretary.

6.3 The Delegate of Morocco informed the Commission that the Council of Ministers of his country had approved the Protocol. He indicated that the ratification procedure had reached the final stage and that FAO would soon be informed.

6.4 The Observer from the EEC expressed regret that eight years after the Paris Protocol, the adhesion of the EEC was still not effective. He thanked Canada and Côte d'Ivoire, which had ratified the Protocol in 1992, and expressed the hope that the remaining countries would proceed with ratification as soon as possible. The EEC Observer also thanked the Commission Chairman for having contacted in 1992 the countries which have not yet ratified the Protocol and asked him to continue these efforts. The EEC itself had made bilateral contacts but had not received any reaction from the countries concerned.

6.5 In this context, the EEC Observer asked ICCAT what legal provisions were foreseen in the statutes of the Commission in case the adherence of the EEC should depend upon the ratification of a country, such as Benin, which has not participated in the work of ICCAT for several years and which does not pay its financial contribution, although it maintains its status of member of the Commission.

6.6 The Chairman stated that a close look would be taken at this problem from a legal point of view. He said that he would once again write to Benin, the Republic of Guinea and Gabon to learn exactly what they plan to do.

Item 9. Results of the CITES Conference (Kyoto, March 1992) as Concerns Atlantic Bluefin Tuna

9.1 The Executive Secretary presented a basic document on the results of the CITES Conference which explains the background of the CITES Conference. There were a large number of participants at the CITES meeting, and the Secretariat prepared several scientific documents and pamphlets explaining the Commission's scientific viewpoint and the other describing Commission activities in research and management. These were available for the participants. Mr. D. Silvestre, France, representing the ICCAT Chairman, and Mr. J. S. Beckett, Canada, had reported on their participation in the CITES Conference and their reports were included in COM/92/14. The Executive Secretary briefly reviewed the proposal by Sweden to include Atlantic bluefin tuna in the CITES Appendices, as well as the results of the Conference.

9.2 The Delegate of Japan made the following statement: "Thanks to the joint effort of ICCAT member nations, we have overcome the difficulties at the last CITES meeting in Kyoto in March this year. In this experience, I believe, we have to clearly recognize the following two points:

1. There must be a clear distinction between management of fishery resources and protection of endangered species. The primary objective of fishery resource management is optimum utilization, whereas endangered species protection does not allow room for utilization. Mixing up the two fields would inevitably put a serious misconcept into the ICCAT's activities, which might lead to a total negation of human utilization of a certain tuna resource. The integrity of ICCAT would be hurt seriously, too. We should not let this undesirable situation take place, and in this respect we were fortunately successful at the last CITES meeting. The next CITES meeting is scheduled in 1994. Our effort must be continued.

2. The second point is a need for taking a decisive step to intensify and complement the ICCAT conservation effort. The fishing activities outside this regime, particularly by the reflagged fleet, are posing a serious danger to our conservation effort. At this meeting, we must take steps to address this issue. Japan made every diplomatic effort to solicit cooperation from non-member nations so far. The hard fact we found after all was that the fishing activities by reflagged fleets are out of any country's control. Although Japan would like to take more decisive measures against such fishing activities, at least the first steps should be taken so that we can assess clearly the magnitude of damage they are causing. More specifically, the certificate of origin program jointly proposed by Japan, U.S., and Canada should

be seriously considered and adopted at this meeting. We know there is some argument that CITES measures can be used for this purpose. But this is not an appropriate approach for the reason I explained earlier. These sort of trade-related measures should be taken in conformity with the conservation and management measures taken by ICCAT. Therefore, ICCAT is the sole responsible and competent international forum where such measures can be appropriately developed and implemented in this region."

9.3 The U.S. Delegate underscored the point raised by Japan that ICCAT is the competent authority to deal with this matter, but progress must also be made and the support of the Commission is absolutely essential.

Item 10. Collaboration of Non-Contracting Parties in the Objectives of ICCAT

10.1 The Commission Chairman introduced this Agenda item and indicated that at this time only a general discussion of Item 10 would take place to give the Contracting Parties an overview on this subject.

a) Report of the Working Group on Catches of Atlantic Bluefin Tuna by Non-Contracting Parties (Tokyo, May 1992)

10.2 The Executive Secretary briefly introduced Documents COM/92/22, 25 and 26. Document COM/92/22 provided a summary of the contacts, mainly through correspondence, that were maintained in 1992 with non-Contracting Parties that engage in tuna and tuna-like fisheries in the Atlantic and Mediterranean areas. He indicated that such contacts involved principally the exchange of information and statistical data, invitations to become Contracting Parties to the ICCAT Convention or to at least participate in the meetings organized by the Commission, as well as other matters relative to ICCAT activities. Dr. Fernández also referred to the responses received from the non-Contracting Parties during the course of 1992.

10.3 The Chairman referred the Commission to the Report of the ICCAT Working Group to Develop the Technical Details for the Implementation of the ICCAT Resolution on Catches by Non-Contracting Parties (Tokyo - May, 1992) (Document COM/92/25). The Chairman asked Mr. K. Shima, the Chairman of the Tokyo Working Group, to summarize the results.

10.4 Mr. Shima noted that 12 of the 22 ICCAT Contracting Parties, as well as observers from several non-Contracting Parties, Taiwan fisheries and the European Community participated in the meeting of the Working Group. The Group recognized the importance of collecting unreported bluefin tuna catches by non-Contracting Party longline fleets flying flags of convenience. The Group also recognized that the countries to which these vessels flying flags of convenience are registered are unable to collect data from these vessels, since the majority of them fish for extended periods in waters that are very distant from the country of registration. This is further complicated since there is often no legislation in the country of registration to implement any control on such fishing activities.

10.5 The Working Group expressed concern about the possible adverse effects that such unreported catches may have on the credibility of ICCAT statistics and the Commission's conservation measures.

10.6 Mr. Shima also highlighted some of the discussions that had taken place at the Working Group meeting regarding schemes to collect statistics on imports and exports of tuna, such as: (1) the collection of statistics on trade and the importance of such statistics to ICCAT assessments on stock conditions; (2) encouraging countries to report the procedures whereby trade statistics are collected and report such information at the November Commission meeting; and (3) encouraging that a feasibility study be carried out on harmonizing codes for tuna in international trade.

10.7 The Chairman of the Working Group also summarized the possible methods discussed by the Group to obtain statistics and other information from non-Contracting Parties, as well as possible measures to discourage fishing activities that are detrimental to ICCAT's conservation program.

10.8 Mr. Shima then summarized the recommendations made by the Tokyo Working Group, such as: (1) the undertaking of joint diplomatic demarches or other coordinated efforts to encourage non-Contracting Parties to cooperate in providing all available statistics on the same basis as that required by Contracting Parties; (2) failing compliance with requests made through diplomatic demarches, the possibility of a GATT-consistent process, such as a certificate of origin regime, to collect these statistics;

and (3) the establishment of a permanent ICCAT working group to improve statistical data, for which the terms of reference should be defined;

10.9 The Report of the "ICCAT Working Group to Develop Technical Details for the Implementation of the ICCAT Resolution on Catches by Non-Contracting Parties" is attached as Annex 5.

10.10 The Commission noted that the Reports of the Management Review Committee Meetings for West Atlantic Bluefin Tuna would be reviewed by Panel 2.

b) Action taken by the Contracting Parties to date

10.11 The Delegation of Japan provided the Commissioners with a document containing information on longline vessels flying various flags of convenience, including photographs of tuna fishing vessels of non-Contracting Parties which operated in the Mediterranean Sea from May to July, 1992, and those boats unloading at various ports.

10.12 The Delegate of the United States complimented Mr. Shima for his summary of the Tokyo Meeting and congratulated him for his excellent chairing of that meeting. He recognized that while the Working Group had made tremendous progress, he was disappointed that agreement could not be reached on the certificate of origin, so that it could have been presented to the Contracting Party governments and whose delegates to this meeting could have come with specific instructions. He indicated that because of this, valuable time had been lost over the last several months. The Delegate of the U.S. indicated that he was particularly distressed about the position of the EEC and those countries that are part of the Community, which halted progress on this important matter. Mr. Blondin hoped that some progress could be made at this meeting The U.S. Delegate noted that diplomatic demarches are essential in assuring that all governments are aware of the situation, but, unfortunately, the responses have been scarce.

10.13 The Delegate of Korea thanked Mr. Shima for his summarized report on the Working Group meeting. He indicated that his country believes, as they expressed at the recent FAO Technical Consultation on High Seas Fishing, that the best way to discourage reflagging is to guarantee the duties of the flag states, that are clearly stated in the U. N. Convention of the Law of the Sea and which indicates the rights and responsibilities that these vessels have.

10.14 The Delegate of Korea also expressed that his government does not, in principle, oppose the introduction of a new scheme of requesting a certificate of origin, but he added that such a program should be limited to the purposes of collecting statistics for effective management of the stocks.

10.15 The Observer from Mexico indicated that although Mexico is a non-Contracting Party of ICCAT, his country has maintained constant information on bluefin tuna fishing in the Gulf of Mexico. Mexico is concerned about the state of this stock and he indicated that his country has continued its observer program initiated in 1988, and expanded it to 100 percent coverage of its tuna fishery.

10.16 The Delegate of Spain recognized that this issue is probably the most important one to be discussed at this year's Commission meeting, and that it is a matter which requires careful study and analysis. He expressed Spain's and other EEC countries' concern for the conservation of tuna resources, especially west Atlantic bluefin tuna. Mr. Conde indicated that while action must be taken, it was not necessarily implied that such action should be unilateral. He felt that the solutions found should be valid and effective and should not provoke a series of problems in chain reaction in other international fora. He also drew the Commission's attention to the steps to be taken as regards legal implications so as not to conflict with GATT and other international agreements.

10.17 Dr. Lima, as Chairman of the Commission, expressed his serious concern about this issue and that ICCAT should be the only international organization to carry out the assessment of bluefin tuna, since if other organizations interfered with this work, it would undermine the credibility of the Commission. He stressed the importance of doing everything possible to confirm ICCAT's credibility as a conservation organization.

10.18 Mr. Shima, speaking as the Head Delegate of Japan, stressed that at present it is practically impossible to assess the magnitude of catches by non-Contracting Parties that fly flags of convenience. The Delegate of Japan summarized the two-fold action taken by his country to date concerning this issue (i.e., diplomatic demarches with non-Contracting Parties and efforts to improve trade statistics).

10.19 As regards the diplomatic efforts taken by Japan, Mr. Shima informed the Commission that, between November, 1991, and July, 1992, his country

had contacted 14 non-Contracting Parties that exported bluefin tuna to Japan in 1991 (Argentina, Greece, Honduras, Indonesia, Italy, Malta, Mexico, Panama, Singapore, St. Vincent, Trinidad & Tobago, Tunisia, Turkey, and the United Kingdom) and requested them to join the Commission and to provide catch statistics to ICCAT. Some countries responded to this demarche and other countries indicated an interest in sending observers to this meeting.

10.20 The Delegate of Japan noted that between August and October, 1992, his country had also made joint diplomatic demarches with other ICCAT Contracting Parties to the 14 non-Contracting Parties mentioned above, and requested them to provide bluefin tuna catch and effort data, including location and fishing method, so that the SCRS could have such data in this year's analysis. Unfortunately, only Tunisia has provided sufficient catch data to date.

10.21 Mr. Shima also informed the Commission that he, together with the U.S. Delegate, had taken part in a joint mission, on the minister level, to Honduras and Panama, in September, 1992. Both these non-Contracting Parties explained very clearly the difficulties they had in collecting such statistics from the reflagged tuna fleet and expressed their support for the introduction of a monitoring system using a certificate of origin.

10.22 The Delegate of Japan also notified the Commission of Japan's implementation of an improved statistical system to collect data on bluefin imports and that the main improvement was the separation of northern and southern bluefin in the trade statistics. Japan also intends to separate bluefin fillet data from the data on the combined tuna fillet imports.

10.23 Mr. Shima also noted that Japan, in response to the Tokyo Working Group's recommendation to encourage that procedures for collecting trade statistics be reported at this meeting, submitted information explaining such procedures, and he hoped that other Contracting Parties of the Commission would do the same.

10.24 The Delegate of Spain informed the Commission that his authorities had tried to carry out joint diplomatic demarches with another Contracting Party, but finally had to carry them out bilaterally. Mr. Conde noted that his Government had stressed, in its bilateral talks, the importance of cooperating with ICCAT more directly, particularly by becoming Contracting Parties. The Delegate of Spain noted that Spain now provides a better breakdown of bluefin trade data by introducing a specific tariff classification for bluefin tuna, since September 1, 1992, at the national level. Spain has also proposed that this method be put into effect at the EEC level.

10.25 The Chairman thanked the participants for the information provided to the Commission. He encouraged the delegations to discuss this matter between Commission sessions and indicated that further discussions would be held at a later Plenary Session.

SECOND PLENARY SESSION

November 9, 1992

Item 8. Report of the Standing Committee on Research and Statistics (SCRS)

8.1 Dr. J. L. Cort (Spain), Chairman of the SCRS, presented the Committee's report to the Commission and summarized the scientific findings. The SCRS Report is attached as Annex 14. He referred to various scientific meetings which the Commission held during the intersessional period and the scientific progress made at these meetings, particularly in the field of improving statistics.

8.2 The SCRS Chairman reported on the results of the assessments made by the Committee on the stocks of yellowfin, bigeye, skipjack, albacore, southern bluefin and bluefin tunas, billfishes, swordfish, as well as small tunas (Item 12 of the SCRS Report). The recommendations for statistics, research and management are included in each species section of the report and the Chairman called the attention of Panels and the Commission to these recommendations

when considering stock management measures. In addition, he requested the Standing Committee on Finance and Administration to give due attention to those recommendations made by the Committee which required funding.

8.3 The SCRS Chairman further informed the Commission that the Sub-Committee on Environment met, with Mr. J. Pereira (Portugal) as Convener, and that its report and recommendations are included as an appendix to the SCRS Report (Appendix 8 to Annex 14).

8.4 The Sub-Committee on Statistics also met, with Dr. S. Turner (U.S.A.) as Convener. Dr. Cort stated that some of the recommendations by this Sub-Committee required significant funding by the Commission and asked that STACFAD pay due attention to these recommendations when considering the 1993 budget.

8.5 The SCRS Chairman also referred to the Bluefin Year Program, proposed and approved in 1991, the Program for Enhanced Research for Billfish, which has been carried out since 1987, and the Albacore Research Program, initiated in 1990. The progress and/or plans for 1993 of these programs are included as appendices to the SCRS Report (Appendices 9, 10 and 11 to Annex 14). He asked all the member countries for monetary and/or research contributions to the Bluefin Year Program, as this important program has no financial assistance from the Commission.

8.6 Referring to publication policy, the Committee recommended that the Report of the Second Billfish Workshop be printed and bound in an enhanced manner, utilizing partial funding from outside sources, and that it be dedicated to Dr. Olegario Rodríguez Martín, the former ICCAT Executive Secretary, in response to the request made by the Commission at its 1991 meeting. The Committee also requested the Commission, when considering financial matters, to discuss the possibility of issuing a special publication on ICCAT's 20-year past history and its future.

8.7 The SCRS Chairman explained that several meetings are scheduled during the 1993 intersessional period, i.e., the "Consultation on the Technical Aspects of Methodology which Account for Individual Growth Variability by Age", to be held at the St. Andrews Biological Station, at the invitation of the Canadian Government; the meeting of the Yellowfin Assessment Working Group, to be held in Tenerife at the invitation of the "Instituto Español de Oceanografía (IEO)"; and the stock assessment session for western Atlantic bluefin, tentatively scheduled for the first week of October, in Madrid. Moreover, it was recommended that swordfish stock assessments be carried out once every two years, but since the effect of current regulations on the stock has to be evaluated in 1993, this meeting should be held one week before the 1993 SCRS Plenary Sessions, while the other species groups will meet for a three-day period during the week prior to the SCRS meeting. The SCRS requested that the Plenary Sessions be held one week before the Commission meeting in 1993.

8.8 Dr. Cort also referred to the progress made in improving Mediterranean statistics as a result of the Second GFCM/ICCAT Expert Consultation on Stocks of Large Pelagic Fishes in the Mediterranean Sea. He noted that the SCRS had recommended that the Commission approve the establishment of an *Ad Hoc* Working Group for Coordination of Research between ICCAT and GFCM and that ICCAT be represented at the next meeting of the GFCM to stress the importance of improving Mediterranean statistics of tunas and tuna-like fishes.

8.9 The SCRS Chairman and all the scientists participating in this year's meeting and research activities were highly commended for the high quality of their research for the Commission.

THIRD PLENARY SESSION
Madrid, November 12, 1992

Item 7. ICCAT Conference of Plenipotentiaries

7.1 The Executive Secretary presented information on the Conference of Plenipotentiaries, which was held in Madrid, on June 4-5, 1992. He informed the Commission that Dr. D. Fadda, who was the legal advisor from FAO for the Conference, was now present at the Commission meeting and available to answer any legal questions that might arise on this matter. The Executive Secretary noted that the

Secretariat had prepared two basic information documents, COM/92/23 and COM/92/24, on this meeting. The first presented the Final Act and the Protocol and the latter presented the Minutes of the Meeting, for which Dr. L. Koffi of Côte d'Ivoire was rapporteur. The text of the Protocol was officially distributed to the Contracting Parties by the Director General of FAO on July 8, 1992. As of November 12, 1992, eight countries had signed the Protocol: Brazil, Côte d'Ivoire, France, Ghana, Morocco, Portugal, Spain, and United States. A special procedure was adopted for the entry into force of this Protocol, which takes into account the fact that the contributions of the developed market economy countries would increase while those of developing countries would decrease. The period for requesting suspension of entry into force by the countries not classified as developed market economy countries would end on January 8, 1993. The Contracting Parties to the Convention should approve, ratify or accept the Protocol as soon as possible through the dispatch of instruments to the Director General of FAO.

Item 10. Collaboration of Non-Contracting Parties in the Objectives of ICCAT (continued from the First Plenary Session)

c) Further action to be taken by the Contracting Parties in the future

10.26 The Observer from CARICOM presented the following statement concerning this Agenda Item:

"CARICOM fully recognized the importance of collecting data on tunas and tuna-like species, contributing them to the assessment process carried out by ICCAT, and of participating in this process. The fact that some States do not report data to ICCAT on a regular basis, is primarily due to a lack of institutional resources and mechanisms for the collection, compilation and submission of these data. Enhancing this capability in CARICOM Member States is a high priority activity for the CARICOM Fisheries Resource Assessment and Management Program, which has been actively pursuing the issue of collection and reporting of data on pelagics, particularly from vessels fishing on the high seas, by promoting the use of the procedures prescribed by ICCAT in its Field Manual.

"The CARICOM Fisheries Program would also like to take this opportunity to note that we have found the first year of collaboration with ICCAT to be very productive, and to thank the Secretariat for its prompt and efficient responses to our request for data and information."

10.27 The "Recommendation Concerning the ICCAT Bluefin Tuna Statistical Document Program", drafted jointly by Canada, U.S.A., Japan, Spain, Portugal and France, was presented to the Commission. This recommendation, which was reviewed and adopted by the Commission, is attached as Annex 6.

10.28 Canada, Japan and the U.S. jointly presented a draft "Resolution to Establish a Permanent Working Group for the Improvement of ICCAT Statistics and Conservation Measures", including the Terms of Reference for this Working Group. The Commission, after reviewing the draft, adopted the Resolution, which is attached as Annex 7.

10.29 Spain proposed and Japan supported the proposal that the Commission encourage all the ICCAT Contracting Parties to improve their trade statistical systems in order to better identify the trade of tuna and tuna-like species, particularly of bluefin tuna, and to inform the Commission of the results. The Commission adopted the proposal.

Item 11. Reports of the Meetings of the Management Review Committee on West Atlantic Bluefin (Tokyo - May, 1992 and Washington, D.C. - September, 1992)

11.1 The Commission noted that the Management Review Committee on West Atlantic Bluefin met twice in 1992 (in Tokyo in May, and in Washington, D.C. in September). The Reports of these meetings were reviewed during the meeting of Panel 2. The Commission adopted these reports, which are attached as Annex 9.

Item 13. Recommendations in Research and Statistics

13.1 The Chairman recalled that the SCRS Chairman had presented in his report the recommendations for research and statistics. The Commission noted that the Panels reviewed all the recommendations concerning stock management;

STACFAD reviewed those recommendations that have financial repercussions. The Commission endorsed all the recommendations made by the SCRS.

Item 14. Large-scale Driftnet Fishing and its Effects on Tuna Stocks

14.1 The Executive Secretary presented document COM-SCRS/92/18 which reviewed the measures adopted by the U.N. General Assembly and those adopted by the Contracting Parties regarding large-scale pelagic driftnet fishing on the high seas. He pointed out that December 31, 1992, was the deadline for the discontinuation of fishing operations using this gear.

14.2 The Delegate of Spain, recalling his previous interventions concerning this matter under other items of the Agenda, reported that his country had prohibited the use of driftnets with the exception of a few small driftnets in the Mediterranean artisanal fisheries. He noted that much harm is done by the use of driftnets, and when not prohibited, the use of driftnets should rigorously follow the conditions of the regulations established to this effect.

14.3 The Delegate of Japan noted that Japan was a co-sponsor of U.N. Resolution 46/215 which resolved, *inter alia*, the global moratorium on all large-scale pelagic driftnet fishing by December 31, 1992. Japan fully respects the U.N. Resolution and is implementing it. The Japanese Government decided to abolish all the fishing licenses for high seas driftnet fishing after January 1, 1993. Most of the 426 driftnet vessels must be scrapped since these vessels cannot be converted for use in an alternate fishery. Even though there are severe budgetary constraints, the Japanese Government has prepared financial support for this drastic restructuring of the industry; however, such support does not totally alleviate the difficulties of the fishermen suffering from loss of their long-standing businesses.

14.4 The Japanese Delegate also stated that scientists from Canada, Japan and the United States had conducted extensive research and had prepared a comprehensive scientific report on the impact of driftnet fishing on various species of living marine resources. However, these findings were practically ignored and the moratorium was forced on the fishermen without sound scientific basis. The decision was made solely on a political and emotional basis. Japan was concerned that such biased decision-making might prevail on other fisheries and might lead to a denial of the rational utilization of living marine resources. The Delegate of Japan indicated that the ocean is the only place on earth where wildlife is still in a relatively healthy condition. The principle of sustainable use of living marine resources is an established one in the world community. Living marine resources must be utilized sustainably based on scientific evidence and this could be the only way for human beings to maintain a stable food supply from the ocean. The history of driftnet fishery must not be repeated in other fisheries.

14.5 The U.S. Delegate noted that his country was one of the leaders of the international effort to obtain a moratorium on driftnet fishing and the U.S. was very pleased at what has been done by the U.N. and by ICCAT. It was a right and responsible decision and while the U.S. does not agree with Japan that there is no scientific basis for this action, it did not wish to enter into debate on this matter at this time. The U.S. is aware of the sacrifice that Japan is making. The U.S. Delegate expressed the hope that the moratorium will be continued and respected by all countries.

14.6 The Korean Delegate stated that Korea has driftnet fisheries on the high seas, but that his country decided to comply with the U.N. Resolution and will cease all high-seas driftnet operations by the end of the year, despite the problems this will cause for Korean fisheries.

Item 15. FAO Conference for the Adoption of a Draft Agreement for the Establishment of the Indian Ocean Tuna Commission (Rome - June, 1992)

15.1 The Executive Secretary presented Document COM/92/27 which reported on discussions at the FAO Conference for the Adoption of a Draft Agreement for the Establishment of the Indian Ocean Tuna Commission. As he and the representative of FAO, Dr. Fadda, had participated in this meeting, he offered to answer any questions from the Commission regarding this meeting. The Commission has taken due note of this information.

FINAL PLENARY SESSION
(November 13, 1992)

Item 18. Reports of Subsidiary Bodies Appointed by the Commission for the Meeting

18.1 Mr. C. J. Blondin, the Delegate of the United States, who represented the Group established under Agenda Item 4, informed the Commission on the results of studies made by the Group, which met during this session, to improve the criteria for inviting and admitting observers. He stated that an attempt had been made to examine this issue, but because of the press of other activities, there was not sufficient time to engage in in-depth discussion. Mr. D. Rideout (Canada) did investigate various rules that have been applied by other international fishery organizations and attempted to draft criteria. However, to establish such criteria for the admission of observers to both the Commission and SCRS meetings was a rather complex issue. Mr. Blondin proposed that this work continue in the interim period through correspondence among the participants of the Group, as well as any other countries that wish to collaborate. If a consensus is reached, a draft would be sent to the Executive Secretary and the Commission Chairman so that it could be acted upon by a mail vote. If no consensus is reached, some information at least would be available to serve as a basis to start working on this issue at the 1993 Commission meeting.

18.2 Several delegations expressed their support of this proposal. The Commission decided that the Group should continue its work, and if a consensus is reached on the criteria by the Group, that the Commission would vote by mail for the adoption of the proposed criteria.

Item 20. Other Matters

20.1 The Delegate of the U.S. commented on the effect that tuna fishing activities by non-Contracting Parties has on ICCAT's conservation measures. He requested that the Commission encourage these non-Contracting Parties to take part in the Commission's activities and to attempt to resolve the problem of reflagging of vessels. Referring to the discussions at the recent FAO Technical Consultation on High Seas Fishing (Rome, September 7-15, 1992) concerning the activities in contravention of international conservation measures, he presented, for the consideration of the Commission, a "Draft Resolution Regarding the Reflagging of Vessels to Avoid Compliance with Internationally Agreed Conservation and Management Measures for Living Marine Resources". This Draft Resolution also calls on the Commission to endorse the pertinent recommendations made at the U.N. Conference on Environment and Development (UNCED), in Rio de Janeiro in June, 1992.

20.2 The Delegate of Spain, noting the importance of solving the problem of the reflagging of vessels, fully supported the Resolution proposed by the United States.

20.3 The Delegate of Japan, in supporting the Resolution proposed by the U.S. Delegate, stated that his country understands the necessity of solving this problem and that Japan was prepared to co-sponsor this proposal. He believed that ICCAT non-Contracting Parties should join the Commission and collaborate in the Commission's management efforts.

20.4 The U.S. Delegate suggested that the problem of countries which do not cooperate in ICCAT activities be put on the Agenda for the 1993 Commission meeting. He informed the Commission that the North Atlantic Salmon Commission is trying to solve this problem through adoption of a Protocol with non-Contracting Parties to secure the cooperation of these countries in conservation measures and he suggested that this possibility might also be studied by the Commission at the 1993 meeting.

20.5 The Delegate of Korea stated that in order to attain the maximum effectiveness, and to assure optimum results in conservation and management of tuna stocks, the Resolution should be communicated to the pertinent non-Contracting Parties to obtain their agreement through negotiation. He further stated that this is a sensitive and controversial issue, involving not only tuna fishing in the Atlantic, but fundamentally high seas fishing as a whole. No favorable results can be expected without the participation of non-Contracting Parties of ICCAT.

20.6 The proposed "Resolution by ICCAT Regarding the Reflagging of Vessels to Avoid Compliance with Internationally Agreed Conservation and Management Measures for Living Marine Resources", which was supported by the delegations present and was adopted by the Commission, is attached as Annex 8.

20.7 The Delegate of Venezuela requested that a paper concerning tuna-porpoise interaction be annexed to the Proceedings. This paper, which was originally submitted by the Venezuelan Delegation at the close of the meeting of Panel 1, could not be reviewed by the Panel due to time constraints.

20.8 The U.S. Delegate, while reiterating that there had been no time to study this paper and that its submission was very late, stated that it seemed to contain positive points regarding placing observers aboard tuna vessels. However, he also noted that there were some statements in the paper, e.g., regarding U.S. laws, which were not factually correct. Therefore, should the Commission decide to append the paper to the Proceedings, the U.S. would have to present a counter-statement and indicated that the Commission's limited schedule would not allow for such a long procedure at this late stage. He requested that this paper not be appended at this time, and suggested that the Delegate of Venezuela, if he so wished, circulate it sufficiently in advance of the 1993 Commission meeting, so that all the Delegations would be able to discuss the paper and come prepared with proper instructions from their respective governments.

20.9 The Delegate of Spain supported the U.S. comments and pointed out that the paper was presented well past the deadline for submission, which must be respected. He also stated that many points raised by the paper would require long complex debates by the Commission. Therefore, he also requested that the study of this paper be deferred until next year.

20.10 The Delegate of France agreed with the Delegates of Spain and the U.S. in not appending the Venezuelan paper at this time.

20.11 The SCRS Chairman referred to the Report of the Sub-Committee on Environment (see Appendix 8 to Annex 14). He reported that Venezuela had suggested a study of the association of tuna fishing with marine mammals. The Sub-Committee Report states: "From the discussion following this proposal, it seems that the problem of tuna fishing associated with dolphins has already been studied by the SCRS in the past and that there is no fishing of dolphins by purse seiners in the Atlantic as there is in the eastern Pacific region. In the intertropical and temperate areas of the Atlantic and the Mediterranean, the association between tunas and dolphins is rarely encountered. The cost of a program which includes the presence of an observer on every tuna vessel would not be compensated for, due to the scarcity of associations between tunas and dolphins in the Atlantic."

20.12 The Chairman declared that a consensus had been reached not to append the paper by Venezuela, but left open the possibility of reconsidering the matter at a future meeting.

20.13 The representative of FAO reported that the Permanent Representative of the United States to the FAO had signed and would soon ratify the Protocol to amend the scheme for calculating the contributions of the ICCAT Contracting Parties, that was adopted in Madrid on June 5, 1992. He stated that as of now a total of eight countries have signed the Protocol.

Item 12. Reports of Panels 1 to 4, and Possible New Regulations to be Considered

12.1 The Reports of Panels 1, 2, 3 and 4 were presented to the Commission. The Commission thanked all the Chairmen and the members of the Panels for the fine work demonstrated during their sessions.

12.2 After the Panel Reports were reviewed, they were adopted by the Commission. At the same time, all the recommendations made by the Panels were endorsed by the Commission, including the recommendations on bluefin tuna and swordfish research specifically drafted by Panels 2 and 4. The Reports are attached as Annex 10.

12.3 The Commission reiterated the recommendations for regulatory measures on western Atlantic bluefin tuna that were adopted at the 1991 Commission meeting, and these are attached as Annex 11.

Item 16. Report of the Infractions Committee

16.1 The Report of the Infractions Committee was presented to the Commission. The excellent work of

the Chairman and the members of the Committee was commended by the Commission. After reviewing the Report, it was adopted by the Commission and is attached as Annex 12. All the recommendations made by the Infractions Committee were also endorsed by the Commission.

Item 17. Report of the Standing Committee on Finance and Administration (STACFAD)

17.1 The Report of the Standing Committee on Finance and Administration was presented to the Commission. The Commission appreciated the efforts of the Committee, particularly as concerns measures recommended by STACFAD to help alleviate, at least over the short-term, the problem of the shortage of cash. The Chairman referred, specifically, to the Resolution authorizing the Executive Secretary to underwrite a policy to open a line of credit.

17.2 The Commission adopted the STACFAD Report and approved all the recommendations included therein, including the revised budget for 1993, the revised 1993 contributions and the Resolution authorizing the Executive Secretary to underwrite a line of credit policy with a bank. The Report is attached as Annex 13.

Item 19. Date and Place of Next Regular Meeting of the Commission

19.1 The Commission decided to hold its Thirteenth Regular Meeting, from Monday, November 8 to Friday, November 12, 1993, in Madrid, Spain.

Item 21. Adoption of Report

21.1 The Delegate of Spain suggested that in the future any text presented at the Commission meeting should indicate the original language of the text. He added that this would make it easier to clarify any discrepancies which might be found between the texts of different languages. He also suggested that the Executive Secretary make every effort to assure that the texts of three language versions are consistent.

21.2 After introducing some editorial modifications, the Proceedings of the First, Second and Third Plenary Sessions of the Commission, together with all Annexes, were adopted, with the understanding that the report of the final session of STACFAD as well as the Proceedings of the Final Plenary Session of the Commission, would be adopted by correspondence. It was also noted that some changes introduced during the adoption of the Panel Reports (particularly Panel 4) should be approved through the correspondence. *

Item 22. Adjournment

22.1 The U.S. Delegate, on behalf of all delegations, commended the chairmanship of Dr. Lima in leading the Commission through some highly controversial debates. His expertise is reflected by the fact that a great deal was achieved at this meeting. The U.S. Delegate also pointed out that the heading of the meeting papers showed times like 00:59 which indicated how long and hard the Secretariat staff worked throughout this meeting. He thanked the interpreters, the Executive Secretary and everyone else who worked very hard to make this meeting a success.

22.2 Dr. A. Fernández stated that the experience of his first year as ICCAT Executive Secretary had been highly gratifying. He was very interested in the achievements made during this meeting. He confirmed the constant availability of the Secretariat during this meeting and assured the Commission that the Secretariat will continue in this spirit during the coming years. He expressed his pleasure in working with the Chairman and thanked the delegations for understanding any errors that may have been made because of the late hours and extreme pressure under which the Secretariat staff was working. The Secretariat had taken note of all the corrections and will incorporate them in the reports, taking into account all the suggestions and decisions made by the delegations.

22.3 The Chairman closed the meeting by saying that agreements have been reached and that the

*As of January 15, 1993, the Proceedings of the Eighth Special Meeting of the Commission were adopted in their entirety.

delegations have cooperated very closely, through understanding and mutual respect. Consensus was reached on several difficult subjects. The responsibility of the Commission was to meet the expectations of the international community and this has been accomplished. The Chairman thanked the observers of non-Contracting Parties and international organizations for their participation. He expressed special thanks to the Secretariat and interpreters, who have facilitated the Commission's work and especially to the new Executive Secretary to encourage him in his future work. He also stated that he had the unfortunate obligation to study the problem of some countries who never attend ICCAT meetings and never pay their contributions. The time has come to think of some way to solve this problem.

22.4 The Chairman adjourned the Eighth Special Meeting of the Commission.

ANNEX 1

1992 COMMISSION AGENDA

1. Opening of the meeting
2. Adoption of Agenda, arrangements for the meeting and appointment of subsidiary bodies
3. Introduction of delegations
4. Admission of observers
5. Review of Commission membership
6. Status of the ratification of the Protocol of amendment to the Convention (signed in Paris in 1984)
7. ICCAT Conference of Plenipotentiaries (Madrid, June, 1992)
   a) Report of the Conference
   b) Status of the ratification or acceptance of the Protocol
8. Report of the Standing Committee on Research and Statistics (SCRS)
9. Results of the CITES Conference (Kyoto, March, 1992) as concerns Atlantic bluefin tuna
10. Collaboration of Non-Contracting Parties in the objectives of ICCAT
    a) Report of the Working Group on Catches of Atlantic Bluefin Tuna by Non-Contracting Parties (Tokyo, May, 1992)
    b) Action taken by the Contracting parties to date
    c) Further action to be taken by the Contracting Parties in the future
11. Reports of the Meetings of the Management Review Committee on West Atlantic Bluefin
12. Reports of Panels 1 to 4, and possible new regulations to be considered
13. Recommendations in research and statistics
14. Large-scale driftnet fishing and its effects on tuna stocks
15. FAO Conference for the Adoption of a Draft Agreement for the Establishment of the Indian Ocean Tuna Commission (Rome, June, 1992)
16. Report of the Infractions Committee
    a) Status of the application of the regulations recommended by the Commission on yellowfin, bigeye, bluefin and swordfish
    b) Port Inspection
17. Report of the Standing Committee on Finance and Administration (STACFAD)
    a) Administrative Report (1992 activities)
    b) Auditor's Report - 1991
    c) Financial status of the first half of the biennial budget - 1992
    d) Contributions pending payment from the Contracting Parties
    e) Review of the Working Capital Fund
    f) Financial status of the Albacore Research Program
    g) Financial status of the Program of Enhanced Research for Billfish
    h) Financial status of the Bluefin Year Program
    i) Review of the financial implications of 1993 Commission activities:
       -- Research and statistics
       -- Intersessional meetings
       -- Publications
       -- Next Commission meeting
       -- Others
    j) Review of the 2nd half (1993) of the biennial budget approved for 1992-1993
    k) Contributions of the Contracting parties to the 1993 budget
    l) Draft wording of the modification of the Financial Regulations to include:
       -- the new scheme for the calculation of contributions of the Contracting Parties
       -- the change in the monetary unit of the Commission budget
    m) Updating of the Staff Rules
    n) Other financial and administrative matters
18. Reports of subsidiary bodies appointed by the Commission for the meeting
19. Date and place of next regular meeting of the Commission
20. Other matters
21. Adoption of Report
22. Adjournment

ANNEX 2

LIST OF COMMISSION PARTICIPANTS*

Member Countries

BRAZIL

MENESES DE LIMA, J.H.*
CEPENE/IBAMA
Rua Samuel Hardman s/n
55578 Tamandaré, Pernambuco

AGUIAR VILARINHO, L.E.
Segundo Secretario
Embajada de Brasil
c/Fernando el Santo, 6
28010 Madrid (Spain)

CANADA

CORMIER, A.*
Regional Director General
Fisheries and Oceans
P.O. Box 5030
Moncton, New Brunswick E1C 9B6

ALDOUS, D.
Southwest Nova Scotia Tuna Association
RR #1 Newport
Hants Co., Nova Scotia B0N 2A0

ALLEN, C.J.
Senior Adviser, Foreign Fishing Policy
and Programs, Fisheries Operations
Department of Fisheries & Oceans
200 Kent St.
Ottawa, Ontario K1A 0E6

ELSWORTH, S.
c/o Sambro Fisheries Limited
Sambro Post Office
Halifax County, Nova Scotia B0J 2Y0

LONGARD, A.
Director
Department of Fisheries
Purdy's Wharf
P.O. Box 2223
Halifax, Nova Scotia B3J 3C4

O'BRIEN, W.
P.O. Box 27
Bay Bulls, Newfoundland A0A IC0

RIDEOUT, D.
International Relations Officer
Department of Fisheries & Oceans
200 Kent St.
Ottawa, Ontario K1A 0E6

SWIM, P.
P.O. Box 40
Clark's Harbour, Nova Scotia B0W 1P0

COTE D'IVOIRE

KOFFI, L.*
Directeur Général des Ressources
Animales
Ministère de la Production Animale
B.P. V-84
Abidjan

AMON KOTHIAS, J.B.
Directeur
Centre de Recherches Océanologiques
B.P. V-18
Abidjan

FANNY, A.
Directeur de l'Aquaculture et des Pêches
B.P. V-19
Abidjan

*Head Delegate.

FRANCE

ROUSSEAU, E.*
Premier Sécrétaire
Ambassade de France
c/Salustiano Olózaga, 9
28001 Madrid (Spain)

ARANAZ, R.
C.I. Thon Rouge
Avenue Jean Poulou
64500 Ciboure - St.Jean de Luz

CREMIEU-ALCAN, P.
Attaché Agricole Adjoint
Ambassade de France
P° de la Castellana, 86 - 6°
28045 Madrid (Spain)

DION, M.C.
Syndicat National des Armateurs
de Thoniers Congélateurs
Criée, B.P. 127
29181 Concarneau, Cédex

ELLISALT, A.
President du Comité du Thon Tropical
Frais
Promenade Chaliapine
64500 St.Jean de Luz

FORTASSIER, A.
48 Chemin du Sucre
34300 Grau d'Agde

GUERNALEC, C.
Comité Central des Pêches Maritimes
51 rue Salvador Allende
92027 Nanterre Cédex

LARZABAL, S.
O.P. Thon Rouge
Quai P. Elissalt
64500 Ciboure

L'HELGOUALC'H, Y.
Président
Comité du Thon Blanc
Criée, Porte Est, Bureau n°8
29900 Concarneau

NOUGUIER, P.
Rue des Trois Pins
34300 Grau d'Agde

PEREZ, S.
Président du Syndicat des Armateurs
66660 Port-Vendres

PARRES, A.
Délégué Général de l'Union des
Armateurs à la Pêche de France
59 rue des Mathurins
75008 Paris

RABOT, J.
Comité Central des Pêches Maritimes
51 rue Salvador Allende
92027 Nanterre Cédex

GHANA

KWEI, E.A.*
Starkist International
P.O. Box 40
Tema

JAPAN

SHIMA, K.*
Deputy Director General
Fisheries Agency of Japan
1-2-1 Kasumigaseki, Chiyoda-Ku
Tokyo 100

AMAMIYA, H.
First Secretary
Embajada del Japón
c/Joaquin Costa, 29
28002 Madrid (Spain)

CAMPEN, S.J.
Consultant
Japan Tuna Fisheries Cooperative
Associations
1800 Birch Road
McLean, Virginia 22101 (U.S.A.)

EGUCHI, H.
Overseas Fishery Cooperation Foundation
Akasaka Twin Tower
17-22, Akasaka 2, Minato-ku
Tokyo

HANAFUSA, K.
Fisheries Agency of Japan
1-2-1 Kasumigaseki, Chiyoda-Ku
Tokyo 100

IKEDA, S.
Federation of Japan Tuna Fisheries
Cooperative Associations
2-3-22 Kudankita, Chiyoda-Ku
Tokyo 102

MIYAHARA, M.
Fisheries Agency of Japan
1-2-1 Kasumigaseki, Chiyoda-Ku
Tokyo 100

OBATA, K.
Agriculture and Fishery Division
Ministry of International Trade & Industry
1-3-1 Kasumigaseki, Chiyoda-Ku
Tokyo 100

OZAKI, E.
Federation of Japan Tuna Fisheries
Cooperative Associations
2-3-22 Kudankita, Chiyoda-Ku
Tokyo 102

SUDA, A.
Federation of Japan Tuna Fisheries
Cooperative Associations
2-3-22 Kudankita, Chiyoda-Ku
Tokyo 102

SUZUKI, Z.
National Research Institute of
Far Seas Fisheries
5-7-1 Orido
Shimizu-shi, Shizuoka 424

TAKAMURA, N.
Federation of Japan Tuna Fisheries
Cooperative Associations
2-3-22 Kudankita, Chiyoda-Ku
Tokyo 102

UMEZAWA, A.
Fishery Division
Ministry of Foreign Affairs
2-2-1 Kasumigaseki, Chiyoda-Ku
Tokyo 100

WATANABE, T.
Federation of Japan Tuna Fisheries
Cooperative Associations
2-3-22 Kudankita, Chiyoda-Ku
Tokyo 102

YAMADA, Y.
Federation of Japan Tuna Fisheries
Cooperative Associations
2-3-22 Kudankita, Chiyoda-Ku
Tokyo 102

KOREA

MIN, B.H.*
Minister
Embassy of the Republic of Korea
c/Miguel Angel, 23
28010 Madrid (Spain)

KIM, Y.G.
Deep Sea Fisheries Production Division
National Fisheries Administration
541, 5-Ga, Nam Dae Moon-ro
Dae Woo Center 19F Jung-Ku
Seoul

PARK, S.T.
International Cooperation Division
National Fisheries Administration
541, 5-Ga, Nam Dae Moon-ro
Dae Woo Center 19F Jung-Ku
Seoul

MOROCCO

LAHLOU, A.*
Secrétaire Général de l'Office
National des Pêches
13-15 rue Chevalier Bayard
Casablanca

PORTUGAL

RIBEIRO LIMA, A.*
Secretario Regional de Agricultura
e Pescas
Governo Regional dos Açores
Rua Consul Dabney
9900 Horta, Faial, Açores

FISCH, G.
Consejero Governo Regional dos Açores
3213 W. Wheeler, #122
Seattle, Washington 98199 (U.S.A.)

FOLQUE SOCORRO, M.
COFACO
Avda. de Vasco da Gama, 29
Lisboa

MACHADO LEITE, A.
Direcçao Geral das Pescas
Avda. de Brasilia
1400 Lisboa

OLIVEIRA, M.E.
Directora Regional das Pescas
Governo Regional dos Açores
Rua Consul Dabney
9900 Horta, Faial, Açores

ORNELAS, J.A.
Direcçao Regional das Pescas
Estrada da Pontinha
9000 Funchal, Madeira

PEREIRA, J.
Universidade dos Açores
Departamento de Oceanografía e Pescas
9900 Horta, Faial, Açores

QUARESMA, O.G.
Consejero Goberno Regional dos Açores
Secretaria Reg. de Agricultura e Pescas
Santa Cruz
9930 Lajes do Pico, Pico, Açores

RUSSIA

LITVINOV, F.F.*
AtlantNIRO
5, Dimitrij Donskogo
23600 Kaliningrad

TSOUKALOV, V.I.
Chief of Fish Resources
Department of the Committee of Fisheries
of Russia
12, Rozdesvensky Blvd.
Moscow - K45

SAO TOME & PRINCIPE

ESPIRITO SANTO DIAS, J.*
Direçao das Pescas
B.P. 59
Sao Tomé

COSTA, G.
Chefe de Departamento Tecnico
Direçao das Pescas
B.P. 59
Sao Tomé

SOUTH AFRICA

SCHOLTZ, W.*
Counsellor
South African Embassy
c/Claudio Coello, 91 - 6°
28006 Madrid (Spain)

PENNEY, A.J.
Sea Fisheries Research Institute
Private Bag X2
8012 Rogge Bay

VAN ZYL, J.A.
Deputy Director
Department of Nature and
Environmental Conservation
Private Bag 9086
8000 Cape Town

SPAIN

CONDE DE SARO, R.*
Director General de Recursos Pesqueros
Secretaría General de Pesca Marítima
c/Ortega y Gasset, 57
28006 Madrid

BELTRAN MENDEZ, B.
Presidente de la Federación de
Cofradía de Pescadores de Lugo
Puerto de Burela
27880 Lugo

BONET, A.
Subdirector General de Política
Comercial con la CEE y el GATT
Min. de Industria, Comercio y Turismo
P° de la Castellana, 160
28046 Madrid

CADENAS DE LLANO, M.C.
Jefa de Negociado de la Sección
de Organismos Multilaterales
Secretaría General de Pesca Marítima
c/Ortega y Gasset, 57
28006 Madrid

CORT, J.L.
Instituto Español de Oceanografía
Apartado 240
39080 Santander

GARAY GABANCHO, A.
Presidente de la Federación de Cofradías
de Pescadores de Bajura de Vizcaya
c/Bailén, 7 bajo
48003 Bilbao (Vizcaya)

GARMENDIA CEBERIO, M.
Organización de Productores de Pesca
de Bajura de Guipúzcoa (OPEGUI)
c/Miraconcha, 9 bajo
20007 San Sebastián (Guipúzcoa)

HERRERO HUERTA, J.B.
Subdirector General de Recursos
Internos Comunitarios
Secretaría General de Pesca Marítima
c/Ortega y Gasset, 57
28006 Madrid

INSUNZA DAHLANDER, J.
Federación Nacional de Cofradías
de Pescadores
c/Barquillo, 7
28004 Madrid

IRIGOYEN BERISTAIN, J.M.
Federación de Cofradías de Pescadores
de Guipúzcoa
c/Miraconcha, 9 bajo
20007 San Sebastián (Guipúzcoa)

LAZARO JIMENEZ, J.
Dirección General de Mercados
c/Estébanez Calderón, 3 y 5
28020 Madrid

LOPEZ GARCIA ASENJO, A.
Consejero Técnico
Dirección General de Recursos
Pesqueros
Secretaría General de Pesca Marítima
c/Ortega y Gasset, 57
28006 Madrid

MARTI DOMINGUEZ, C.P.
Subdirectora General de
Comercialización Pesquera
Secretaría General de Pesca Marítima
c/Estebanez Calderón, 3 y 5 - 7ª planta
28020 Madrid

MEJUTO GARCIA, J.
Instituto Español de Oceanografía
Apartado 130
15080 La Coruña

ODRIOZOLA AZURMENDI, J.N.
Director General de Azti-Sio
Isla de Txatxarramendi
Sukarrieta (Vizcaya)

OLAIZOLA ELIZAZU, E.
Federación de Cofradías de Pescadores
de Guipúzcoa
Presidente de la Cofradía de Fuenterrabía
c/Miraconcha, 9 bajo
20007 San Sebastián (Guipúzcoa)

PALLARES SOUBRIER, P.
Instituto Español de Oceanografía
c/Corazón de María, 8
28002 Madrid

POVEDANO INCERA, J.A.
Presidente de la Federación Cántabra
de Pescadores
c/Marqués de la Hermida, s/n (Lonja)
39080 Santander

RODRIGUEZ MUÑOZ, C.
Subdirección General de Comercialización
Pesquera
Secretaría General de Pesca Marítima
c/Estebanez Calderón, 3 y 5 - 7ª planta
28020 Madrid

RODRIGUEZ RODRIGUEZ, B.
Cofradía de Pescadores "Santa Tecla"
c/Baixo Muro, 32
36780 La Guardia (Pontevedra)

SANTIAGO, J.
Azti-Sio
Isla de Txatxarramendi
Sukarrieta (Vizcaya)

SARRO IPARRAGUIRRE, G.
Organización de Productores Asociados
de Grandes Atuneros Congeladores
(OPAGAC)
c/Ayala, 54 - 2°A
28001 Madrid

SEOANEZ CALVO, C.
Jefe Sección de Organismos Multilaterales
Secretaría General de Pesca Marítima
c/Ortega y Gasset, 57
28006 Madrid

TORRES-DULCE RUIZ, A.
Director de Asuntos Generales
Dirección General de Relaciones
Económicas Internacionales
Ministerio de Asuntos Exteriores
Plaza de la Provincia, 1
28012 Madrid

ULLOA ALONSO, E.
Asociación Nacional de Armadores de
Buques Palangreros de Altura (ANAPA)
Puerto Pesquero
Edificio Vendedores, Oficina 1-6
36204 Vigo (Pontevedra)

URBIETA BURGAÑA, J.M.
Presidente de la Organización de Productores
de Pesca de Bajura de Guipúzcoa
c/Miraconcha, 9 bajo
20007 San Sebastián (Guipúzcoa)

UNITED STATES OF AMERICA

BLONDIN, C.J.*
Deputy Assistant Secretary
for International Interests
U.S. Dept.of Commerce - NOAA
14th & Constitution NW, Room 6225
Washington, D.C. 20230

BROWN, B.E.
Southeast Fisheries Center
NMFS
75 Virginia Beach Drive
Miami, Florida 33149

BRYANT, L.G.
Congressional Staff
H2-577 Ford House Office Building
Washington, D.C. 20515

DEAN, J.M.
Center for Environmental Policy
University of South Carolina
Columbia, South Carolina 29208

DOYLE, P.
Second Secretary
Economic Affairs
U.S. Embassy
c/Serrano 75
28006 Madrid (Spain)

FLEMMA, J.
Fish & Wildlife Subcommittee
U.S. House of Representatives
House Annex II, Room 543
Washington, D.C. 20515

FOLSOM, W.B.
NMFS/F/IA1, Room 7276
1335 East-West Highway
Silver Spring, Maryland 20910

HALLMAN, B.S.
Deputy Director
Office of Fisheries Affairs
Department of State
22nd & C St., NW
Washington, D.C. 20520

HOEY, J.
Bluewater Fishermen's Association
1525 Wilson Blvd., Suite 500
Arlington, Virginia 22209

McCALL, M.
NOAA
Office of General Counsel Attorney
1335 East-West Highway
Silver Spring, Maryland 20910

McCALLUM, J.
U.S. House of Representatives
House Annex II, Room 545
Washington, D.C. 20515

MONTGOMERY, M.B.
13200 Crossroads Parkway North 350
City of Industry, California 91746

RADONSKI, G.C.
President, Sport Fishing Institute
1010 Massachussets Ave. NW
Washington, D.C. 20001

RUAIS, R.P.
Executive Director
East Coast Tuna Association
Salem, New Hampshire 03079

SCHAEFER, R.H.
Director, Office of Fisheries
Conservation and Management - NMFS
1335 East-West Highway
Silver Spring, Maryland 20910

SLOAN, S.
The Confederation of Associations
of Atlantic Charterboats & Captains
230 Park Avenue, Suite 1221
New York, New York 10169

STONE, R.B.
Chief, Highly Migratory Species
Management Division
Fisheries Conservation & Management
NOAA/NMFS (F/C M3)
1335 East-West Highway
Silver Spring, Maryland 20910

SUTTON, M.
Director of Marine Policy
World Wildlife Fund
1250 24th St., NW
Washington, D.C. 20037

WEDDIG, L.J.
National Fisheries Institute
1525 Wilson Blvd., Suite 500
Arlington, Virginia 22209

VENEZUELA

GINEZ, A.*
Director, Producción y Control
Ministerio de Agricultura y Cría
Dir. Gen. Sectorial de Pesca y Acuicultura
Torre Este, Piso 10
Caracas

GIMENEZ, C.E.
Director Ejecutivo
AVATUN
c/Los Laboratorios
Torre Beta, Piso 1°, 108A
Caracas

ARELLANO PINTO, J.
Dirección General Sectorial de Fronteras
División de Fronteras Marítimas
Ministerio de Relaciones Exteriores
Torre MRE, esq. Carmelitas, Piso 13
Caracas

******

Observers

CAMEROON

GANG, B.Y.
Second Counsellor
Embassy of Cameroon
Rosario Pino, 3
28020 Madrid (Spain)

ITALY

BACCIN, M.
Primer Consejero para Asuntos
Económicos
Embajada de Italia
Lagasca, 98
28006 Madrid (Spain)

MAURITANIA

KANE CIRE, A.
Conseiller Technique
Ministère des Pêches et
de l'Economie Maritime
B.P. 137
Nouakchott

EJIWEN, M.H.
Chef de Service Aménagement
et Réglementation
Ministère des Pêches
B.P. 137
Nouakchott

AHMED TALEB, S.E.M.
Ministère des Pêches et
de l'Economie Maritime
B.P. 137
Nouakchott

MEXICO

COMPEAN, G.
Universidad Autónoma de Nueva León
Facultad de Ciencias Biológicas
Apartado Postal 16, Suc."F"
66450 San Nicolás de los Garza

SWEDEN

FORSBERG, L.
Second Secretary
Swedish Embassy
c/Caracas, 25
28010 Madrid (Spain)

THORELL, L.
Swedish Environmental Protection Agency
(Naturvardsverket)
S-17185 Solna

International Organizations

CARICOM

MAHON, R.
Senior Resource Assessment Unit Leader
c/o CFRAMP
Tyrell St.
Kingstown, St. Vincent & The Grenadines
(West Indies)

COMMISSION OF THE EUROPEAN COMMUNITIES

SPEZZANI, A.
99 rue Joseph II
B-1040 Bruxelles (Belgium)

HARNIER, O.
170 rue de la Loi
B-1048 Bruxelles (Belgium)

FAO

FADDA, D.
Juriste
Service Juridique
Organisation des Nations Unies pour
l'alimentation et l'agriculture (FAO)
Via delle Terme di Caracalla
00100 Roma (Italy)

******

TAIWAN

SHIEH, D.W.
Deputy Director, Fisheries Department
Council of Agriculture
37 Nan-Hai Road
Taipei

LIN, R.C.
Vice-Chairman, International Fisheries
Promotion & Cooperation Committee
Taiwan Tuna Association
3rd floor, No.10, Lane 101, Section 1
Ta-An Road
Taipei

******

Commission Secretariat

A. Fernández
P.M. Miyake
P. Kebe

M.E. Carel
M.A. F. de Bobadilla
J.L. Gallego
F. García
C. García Piña
S. Martin
G. Messeri
A. Moreno
J.A. Moreno
P. Seidita
G. Stephens
G. Turpeau

Interpreters

M. Castel
L. Faillace
C. Lord
I. Meunier
T. Oyarzun
V. Parra

Temporary Staff

F. Bellemain

ANNEX 3

LIST OF DOCUMENTS FOR 1992 COMMISSION MEETING

	Tentative Program of 1992 Commission Meetings
COM/92/1	1992 Tentative Commission Agenda
COM/92/2	1992 Annotated Tentative Commission Agenda
COM/92/3	1992 Tentative Agenda of the Standing Committee on Research and Statistics (SCRS)
COM/92/4	Tentative Agenda of the Standing Committee on Finance and Administration (STACFAD)
COM/92/5	Tentative Agenda of Panels 1-4
COM/92/6	Tentative Agenda of the Infractions Committee
COM/92/7	Panels
COM/92/8	1992 Administrative Report
COM/92/9	1992 Financial Report
COM/92/10	Secretariat Report on Statistics and Coordination of Research
COM/92/11	Report of the Progress Made in 1992 in the Albacore Program
COM/92/12	Secretariat Report on the Coordination of the ICCAT Enhanced Billfish Research Program
COM/92/13	Report of the Progress Made by the Bluefin Year Program (BYP)
COM/92/14	Extracts of the Meeting Summary of the Tenth Session of Committee I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (Kyoto, Japan, March 2-13, 1992)
COM/92/15	The Report of the Data Preparatory Meeting for Southwest Atlantic Tuna and Tuna-Like Fisheries (Recife, Pernambuco, Brazil, July 1-7, 1992)
COM/92/16	Report of the Second ICCAT Billfish Workshop (Miami, Florida, USA, July 22-29, 1992)
COM/92/17	Second GFCM/ICCAT Expert Consultation on Stock Assessment of Large Pelagic Fishes in the Mediterranean Sea (Heraklion, Crete, Greece, September 17-23, 1992)
COM/92/18	Information Concerning Large-Scale Pelagic Driftnet Fishing on the High Seas
COM/92/19	Technical Consultation on High Seas Fishing (Rome, 7-15 September, 1992)
COM/92/20	Status of the Regulatory Measures Recommended by ICCAT for the Conservation of Yellowfin Tuna, Bigeye Tuna, Bluefin Tuna and Swordfish
	Supplement No. 1: Canadian Regulations Implemented to Enforce ICCAT Swordfish Management Measures

Supplement No. 2: Implementation of ICCAT Swordfish Management Recommendations by South Africa
Supplement No. 3: Record of the U.S. Implementation of the 1990 ICCAT Swordfish Recommendations

COM/92/21 ICCAT Port Inspection

COM/92/22 Collaboration of Non-Contracting Parties in the Objectives of ICCAT

COM/92/23 Conference of Plenipotentiaries of the Contracting Parties to the International Convention for the Conservation of Atlantic Tunas (Madrid, June 4-5, 1992) - Final Act and Protocol

COM/92/24 Conference of Plenipotentiaries of the Contracting Parties to the International Convention for the Conservation of Atlantic Tunas (Madrid, June 4-5, 1992) - Minutes of the Conference

COM/92/25 ICCAT Working Group to Develop Technical Details for the Implementation of the ICCAT Resolution on Catches by Non-Contracting Parties (Tokyo, Japan, May 19-22, 1992

COM/92/26 Report of the First Meeting of the Management Review Committee for West Atlantic Bluefin Tuna (Tokyo, Japan, May 22 and 25, 1992)

COM/92/27 Conference for the Adoption of a Draft Agreement for the Establishment of the Indian Ocean Tuna Commission (Rome, June 22-26, 1992)

COM/92/28 Modification of the ICCAT Financial Regulations

COM/92/29 Draft of the ICCAT Staff Regulations and Rules

COM/92/30 Report of the Second Meeting of the Management Review Committee for West Atlantic Bluefin Tuna (Washington, D.C., September 11, 1992)

COM/92/31 Proposal for Revision of the Budget Approved for 1993

ANNEX 4

OPENING ADDRESSES

Opening Address by Mr. J. Loira Rua
General Secretary of Maritime Fisheries of Spain

Mr. Chairman, Distinguished Delegates, Mr. Representative of the EC, Observers:

It is an honor for me to welcome you to the Eighth Special Meeting of the International Commission for the Conservation of Atlantic Tunas.

Since we last met at the time of the Twelfth Regular Meeting of the Commission in November, 1991, many events have taken place on an internal as well as on an international level.

At the internal level, the most outstanding events were the incorporation of the new Executive Secretary, Dr. Antonio Fernández González, the meeting in Tokyo of the Working Group on the Catches of Bluefin Tuna by non-Contracting Parties, and the Conference of Plenipotentiaries held in Madrid. As regards the Conference of Plenipotentiaries, the objective was to amend paragraph 2 of Article X of the Convention so as to modify the scheme of calculating the contributions that is currently in effect. The Final Act, which required tremendous solidarity and cooperation of all the Parties, is on deposit at the FAO for acceptance or ratification by all the ICCAT Contracting Parties.

At the international level, and as a result of the ever-increasing concern of governments for the conservation of fisheries resources to assure maximum sustainable exploitation, three important meetings were held in 1992: the Conference on Responsible Fishing, in Cancun in May; the Meeting of the U. N. Conference on Environment & Development, in Rio de Janeiro in June; and the FAO Technical Consultation on High Seas Fishing, in Rome in September.

At all of these meetings discussions took place on the different problems that are common to the fishing sector. Two essential elements, among others, to carry out a responsible management of fishing in the Exclusive Economic Zones as well as on high seas were identified.

These elements are, on the one hand, cooperation, and, on the other, the strengthening of regional and multilateral fishing organizations. Thus, it will be necessary to provide them with adequate means to attain their objectives, which are common to us all.

Therefore, from here I would like to make an appeal that all the Protocols of amendment to the Convention be ratified as soon as possible so that our Commission can continue with the excellent work it has been carrying out since its creation. Only if each and every one of the Contracting Parties assume the responsibilities which are inherent in membership in the Commission will it be possible for ICCAT to continue guiding us in the planning of strategies of exploitation of tunas in the Atlantic Ocean.

I know that you have a very full agenda and that, among other items, you will be studying in detail the scientific report on the state of the various tuna stocks and that probably you will have to make decisions on the status of some of these stocks and revise the current recommendations. Therefore, I will not take up any more of your time.

I wish you success in your work and a pleasant stay in Madrid.

Opening Address by Dr. A. Ribeiro Lima
Chairman of the Commission

Distinguished Delegates:

I am honored to declare open the sessions of the Eighth Special Meeting of this Commission.

First of all, I would like to thank all the representatives of the Contracting Parties for being here, and for the confidence deposited in me in electing me Chairman of the Commission. I would like to reiterate my firm resolve to carry out my mandate as Chairman with impartiality, flexibility and efficiency, to assure that the objectives of the ICCAT Convention are achieved.

Distinguished Delegates, this year of 1992 has been a particularly important one for ICCAT. In the month of February an exceptional ceremony in the history of the Commission was held to bid farewell to Dr. O. Rodríguez Martín, to whom we convey an affectionate greeting, and to welcome the new Executive Secretary Dr. Antonio Fernández, whom I am also honored to welcome to the Commission meetings. I have had frequent contacts with Dr. Fernández during these months and have been able to value his skill in carrying out the important and delicate mission at the head of the Secretariat.

The event that highlighted our calendar this year was the Conference of Plenipotentiaries to amend Article X of the Convention, and thus making it possible to use a new scheme for the financing of our future budgets. As you know, we reached a laudable consensus to carry out such an amendment, and now we hope that all the Contracting Parting will expedite the mechanisms necessary for it to enter into effect as soon as possible.

As regards the Protocol adopted in Paris in 1984, for the first amendment to the ICCAT Convention, and which was ratified by the Government of Canada in 1992, I have written a letter to the governments of the five countries that still have not ratified the Protocol, and expressed the wish that procedures be accelerated as much as possible.

There was a considerable number of international meetings that ICCAT participated in this year. Many of these meetings were organized by the Commission and others in which ICCAT actively participated either as a member or as an observer. Of these, ICCAT's participation at three meetings in particular was noteworthy: the CITES Conference held last March, which resulted in putting the bluefin tuna issue in the proper perspective; and the two meetings in Tokyo, in May, held in accordance with the resolution adopted in 1991 concerning the catches of bluefin tuna by non-Contracting Parties. As you are all well aware, the matter of collaboration by the non-Contracting Parties in ICCAT's objectives and responsibilities is of fundamental importance, and I am sure that our debates will contribute towards deciding the actions to be taken for next year.

Distinguished Delegates, we have a very full schedule with many matters of interest. I am confident of your active collaboration, so that we can study all these items in the short time we have available. Let us try to follow the agenda we adopt, and dedicate the time foreseen for each agenda item.

As regards administrative matters to be discussed, one of the most important is the draft of the new Staff Regulations and Rules, to be presented by the Executive Secretary, in accordance with instructions given at our last meeting.

Before concluding this introduction, I consider it my duty to transmit to you, as Chairman of ICCAT, my grave concern for the Commission's current financial situation. As noted from the financial report that the Executive Secretary is presenting, we should discuss this matter seriously and realistically, in order to find a solution to this transitory crisis. Hopefully, the new calculation scheme, adopted by our Conference of Plenipotentiaries, will be operative for the 1994-95 biennial period. To this effect, among the documentation prepared by the Secretariat, there is a draft on the modifications to introduce to our Financial Regulations once the amendment of the Convention enters into effect.

Thank you for your attention.

ANNEX 5

REPORT OF THE ICCAT WORKING GROUP TO DEVELOP TECHNICAL DETAILS FOR THE IMPLEMENTATION OF THE ICCAT RESOLUTION ON CATCHES BY NON-CONTRACTING PARTIES

(Tokyo, Japan - May 19-22, 1992)

1. Opening of the Meeting

1.1 The ICCAT Working Group to develop the technical details for implementation of the resolution concerning catches by non-contracting parties (which was adopted by the Commission at its Twelfth Regular Meeting, November, 1991), was held at the Hotel Kayu-Kaikan, in Tokyo, Japan, on May 19 to 22, 1992, at the invitation of the Government of Japan.

1.2 Dr. P. M. Miyake, ICCAT Assistant Executive Secretary, opened the session, on behalf of Dr. Antonio Fernández, the Executive Secretary of the Commission.

1.3 Dr. Miyake introduced Mr. Toshihiko Tsuruoka, Director General of the Fisheries Agency of Japan, the distinguished guest speaker, who welcomed the participants to the meeting. His opening address is attached to this report as Appendix 3 to Annex 5.

2. Meeting Arrangements (Election of Chairman, Election of Rapporteur, etc.)

2.1 Mr. K. Shima, the Deputy Director of the Fisheries Agency of Japan and Head Delegate of Japan to ICCAT, was elected Chairman. Dr. P. M. Miyake (ICCAT Secretariat) was selected rapporteur. Considering the nature of the Working Group, the proceedings of the meeting were carried out in one working language, English. The Group formed a Press Committee, with open membership, to prepare a press release on the meeting.

3. Admission of Observers and Meeting Documents

3.1 Twelve of the 22 ICCAT Contracting Parties were represented at the Working Group meeting. Participants from Cameroon, Colombia, Costa Rica, Mexico, Rumania, Senegal, Sweden, Taiwan Fisheries and the European Community were admitted as observers, since these countries and organizations had been formally invited and their respective delegates presented credentials. The ICCAT Secretariat provided support to the meeting. The List of Participants is attached as Appendix 2 to Annex 5.

4. Adoption of Agenda

4.1 The Tentative Agenda, prepared and distributed in advance of the meeting, was adopted with slight modification and with the understanding that the Working Group could be flexible in its discussions of each Agenda Item. The Agenda is attached as Appendix 1 to Annex 5.

4.2 Some discussion ensued as to the Working Group's terms of reference. It was recognized that this Working Group was recommended within the "ICCAT Resolution concerning catches of Bluefin Tuna by Non-Contracting Parties" (attached as Appendix 4 to Annex 5).

4.3 Although the title of the November 1991 ICCAT resolution specifically mentions bluefin tuna catches, the Group recognized that a part of the resolution refers to all tuna and tuna-like species and that the problems related to the catches of bluefin tuna by non-Contracting Parties might not be limited to bluefin. Hence, the Group agreed to concentrate on bluefin

tuna catches, but not to limit discussions to that species.

5. Review of the Tuna Statistics of Non-Contracting Parties

5.1 The Secretariat presented a document showing a statistical analysis of the proportions of total annual catches by the ICCAT Contracting Parties and non-Contracting Parties, based on the ICCAT data base of annual catches. The analysis explains the statistical problems related to catches by non-Contracting Parties. The Group recognized that while many non-Contracting Parties collaborate with ICCAT in reporting their catches and/or adopting the regulatory measures recommended by the Commission, other non-Contracting Parties do not collaborate with ICCAT in any respect.

5.2 Japan provided the Working Group with preliminary estimates of the magnitude of bluefin tuna imported to Japan from non-Contracting Parties, and suggested that those bluefin catches may not have been included in the ICCAT statistical system.

5.3 The Group recognized the importance of collecting unreported bluefin tuna catches by non-Contracting Parties. Those tuna are mostly exported to the Japanese market. The most serious problem exists with catches taken by fishing vessels which fly flags of convenience. It was recognized that the catches of most of these boats were monitored in the past by the ICCAT sampling system, but due to the bluefin tuna regulations implemented in recent years, such monitoring has become increasingly difficult. The countries to which these vessels flying flags of convenience are registered are unable to collect data from these vessels, since the majority of them fish for extended periods in waters that are very distant from the country of registration. This is further complicated by the fact that at present there is often no legislation in the country of registration to implement any control on such fishing activities. Consequently, catches by these boats are excluded from the national or ICCAT statistical collection schemes.

5.4 While recognizing the difficulties of collecting statistics from the fleets of non-Contracting Parties that do not collaborate with ICCAT, the Group expressed its concern about the possible adverse effects that such unreported catches may have on the credibility of ICCAT statistics and its conservation measures. This could become particularly pronounced in the future as the regulatory measures adopted by the Commission become more stringent. These catches taken outside the monitoring quota, and their proportion in the total catch, will increase as the regulated catches decrease.

5.5 To help alleviate this problem, ICCAT has, since 1988, taken action, such as inviting the non-Contracting Parties that fish tunas in the ICCAT Convention area to join the Commission, or, in the alternative, to participate in ICCAT meetings in an observer capacity. ICCAT has also urged these non-Contracting Parties to collect statistics from their flag fleets and to adopt and implement the management measures recommended by the Commission. Up to the present, ICCAT's efforts seem to have met with moderate success with the non-Contracting Parties in the Mediterranean area, but they have been totally unsuccessful in other areas.

5.6 Many participants at the Working Group were of the opinion that the efforts by the Secretariat may have certain limitations. The group felt that diplomatic demarche, on a bilateral or joint basis, might produce more fruitful results, particularly if backed up by evidence, such as photos. This aspect was discussed in more detail under Agenda Items 6 and 7.

5.7 The Working Group decided that catches estimated by using the trade data presented at this Working Group meeting were of a preliminary nature. Therefore, it was decided not to appendix this information to the Group's report.

6. Review of the Commission's Current and/or Future Schemes to Collect Statistics on Imports and Exports of Tuna and Tuna-like Fishes

6.1 The Working Group discussed whether the collection of statistics on trade comes under the mandate of the Commission. The Group recognized that the collection and estimation of accurate statistics does indeed lie within ICCAT's mandate and are essential for the assessment of stock conditions. The Group also felt that trade statistics would prove beneficial to estimating tuna catches more accurately.

6.2 As a major tuna importer, Japan explained its system of collecting statistics on such imports. Countries are encouraged to report the procedures through which their trade statistics are collected at the next Commission meeting in November, 1992.

6.3 Spain reported on the standardized codes his country has adopted to record imported tuna products.

The Working Group encouraged that a feasibility study be initiated on harmonizing the codes for tuna in international trade.

7. Possible Methods to Obtain, from Non Contracting Parties, Statistics and Information on Tuna Fishing Activities (such as: type of vessels, flag nations, names of vessels; reported or estimated catches, landings and/or trans-shipment of tunas; landing ports through which tunas are shipped, etc.)

7.1 Since the discussions under Agenda Item 5 covered this subject, the Group considered possible, realistic methods that might provide better information on the fishing activities, mentioned above, from non-collaborating, non-Contracting Parties.

7.2 Action taken by the Contracting Parties and by the Secretariat concerning the resolution adopted by the Commission at its 1991 meeting (Appendix 4 to Annex 5) was reviewed for each item of that resolution.

Paragraph 1: The Secretariat keeps the non-Contracting Parties well informed of all its activities and management recommendations and tries to stimulate their interest in becoming members of the Commission. The Group requested that the Secretariat maintain this contact and invite the non-Contracting Parties to join the Commission.

Paragraph 2: Some participants indicated that their respective countries made special diplomatic efforts to urge some non-collaborating, non-Contracting Parties to join the Commission or to collaborate with ICCAT by providing data, etc.

Paragraphs 3 and 4: The Group noted that the Secretariat had, in early 1992, requested statistics from all the non-Contracting Parties which fish tuna in the ICCAT Convention waters, and that several reminders had also been sent.

Paragraph 5: The Group noted that some countries have already initiated action to comply with this recommendation.

Paragraph 6: It was pointed out that the present Working Group was convened according to this recommendation.

7.3 There was considerable discussion concerning the recommendations which the Working Group wished to submit to the Commission. Some participants felt that the situation required immediate action to implement trade-related measures that would provide accurate statistics, while others considered that all other possible deterrent measures should be exhausted before any trade-related measures could be discussed. After considerable discussion and successive meetings of the drafting group, the Working Group agreed upon the text of the attached "Recommendation by the Working Group on Tuna Fishing Activities by non-Contracting Parties" (Appendix 6 to Annex 5). This recommendation was then reviewed from various aspects of the agenda items which follow.

7.4 At the same time, the Working Group also recommended that the Contracting Parties conduct diplomatic demarche with these non-collaborating, non-Contracting Parties. A model *Aide-Memoire* was prepared for this purpose and is attached as Appendix 5 to Annex 5.

8. Consideration of Possible Measures to Discourage the Fishing Activities Contrary to the ICCAT Conservation Program for the Atlantic Bluefin Tuna Stock:

a) Possible measures to prohibit the transfer at sea of western Atlantic bluefin tuna between vessels from different countries

8.1 The Working Group recognized the importance of keeping track of the tuna catches and the origin of these fish. In this sense, the Group felt that "prohibit the transfer" in the resolution might be better interpreted as "monitor the transfer". On the other hand, if the activity involved the transfer at sea of unreported and illegally-caught fish, then such transfer should be prohibited.

8.2 It was noted that all the Contracting Parties that fish a meaningful amount of bluefin tuna in the west Atlantic, as well as many other Contracting Parties, have adopted domestic regulatory measures to prohibit the transfer of the catches at sea between boats (even of their own nationality). However, the Group also recognized that implementation of such regulations is more complicated than just adopting them.

8.3 The Working Group encouraged that countries adopt legal measures to monitor the transfer of catches

at sea between vessels, if such measures have not already been taken.

b) Consideration of possible measures to prevent the re-flagging of vessels of Contracting Parties for the purpose of avoiding fisheries management measures established by the Commission

8.4 While admitting that the re-flagging of vessels can have an adverse effect on the Commission's management scheme, the Working Group recognized that it is difficult for the countries to prohibit their boat owners from changing vessel registration to another country. The Northwest Atlantic Fisheries Organization (NAFO) has had some success in this matter through the use of diplomatic demarche, and as a result, some re-flagged vessels have apparently had their registrations withdrawn.

8.5 The Group recognized that this item is related to the problems discussed under the Agenda Item 7 and noted that undertaking joint diplomatic demarche could provide a possible solution for this problem.

c) Other possible measures

8.6 While the Working Group could not decide on any effective counter-measures against uncontrolled fishing activities outside ICCAT, Japan declared that it would continue its effort to solicit more conclusive measures in the future, particularly as it concerns western Atlantic bluefin tuna and the conservation of this stock.

8.7 The United States had hoped that more decisive action concerning monitoring catch data as well as trade measures would be agreed upon at this Working Group. However, since no consensus was reached, the U.S. indicated it would continue its effort, within this Commission, to solve this problem.

9. Study Whether the Above Measures are Consistent with the General Agreement on Tariffs and Trade (GATT) and Other Legal Instruments and Accepted International Practices

9.1 The Working Group studied the recommendation (Appendix 6 to Annex 5) drafted under Agenda 7 with respect to its consistency with the General Agreement on Tariffs and Trade (GATT) and other legal instruments and accepted international practices. The Group believed that this recommendation is not in contradiction with such legal aspects, although the matter requires further consideration.

10. Recommendations to the Commission

10.1 The recommendation, agreed upon by the Working Group, concerning tuna fishing activities by non-Contracting Parties, was drafted under Agenda Item 7 and reviewed under various other Agenda items, and is attached as Appendix 6 to Annex 5.

10.2 In agreeing with the aforementioned Recommendation, some participants indicated that they still have to take this back to their respective home governments for review and final approval.

10.3 The Working Group noted that this Recommendation to the Commission requires some immediate action, even before it is adopted by the Commission, e.g., undertaking diplomatic demarche. The Group, however, was confident that such action was within the terms of reference of this Working Group.

11. Adoption of Report

11.1 The Report was adopted with modifications.

12. Other Business

12.1 The Working Group agreed that any follow-up and/or new developments concerning the recommendations made at this time will be continuously reviewed, through correspondence, between the Contracting Parties until the 1992 Commission meeting.

13. Adjournment

13.1 The Working Group expressed their appreciation to Japan for hosting the meeting and for providing such excellent facilities. They commended Mr. Shima for the outstanding job he did of chairing the sessions. The Working Group also thanked the translators and the ICCAT Secretariat for their assistance.

13.2 The Meeting of the Working Group was adjourned.

Appendix 1 to Annex 5

Agenda of the
ICCAT Working Group on Tuna Catches by
Non-Contracting Parties

1. Opening of the Meeting
2. Meeting Arrangements (Election of Chairman, Election of Rapporteur, etc.)
3. Admission of Observers and Meeting Documents
4. Adoption of Agenda
5. Review of the Tuna Statistics of Non-Contracting Parties
6. Review of the Commission's Current and/or Future Schemes to Collect Statistics on Imports and Exports of Tuna and Tuna-like Fishes
7. Possible Methods to Obtain, From Non-Contracting Parties, Statistics and Information on Tuna Fishing Activities (such as: type of vessels, flag nations, names of vessels; reported or estimated catches, landings and/or transshipments of tunas; landing ports through which tunas are shipped, etc.)
8. Consideration of Possible Measures to Discourage the Fishing Activities Contrary to the ICCAT Conservation Program for the Atlantic Bluefin Tuna Stock:
   a. Possible measures to prohibit the transfer at sea of western Atlantic bluefin tuna between vessels from different countries
   b. Consideration of possible measures to prevent the re-flagging of vessels of Contracting Parties for the purpose of avoiding fisheries management measures established by the Commission
   c. Other possible measures
9. Study Whether the Above Measures are Consistent With the General Agreement on Tariffs and Trade (GATT) and Other Legal Instruments and Accepted International Practices
10. Recommendations to the Commission
11. Adoption of Report
12. Other business
13. Adjournment

Appendix 2 to Annex 5

List of Participants at the
ICCAT Working Group on Tuna Catches by
Non-Contracting Parties

ICCAT CONTRACTING PARTIES

BRAZIL

J. H. Meneses de Lima
L. Amayo de Benedek

CANADA

J. E. Haché
C. J. Allen
B. O'Brien
P. T. T. Swim
D. Rideout
P. Robertson

GABON

R. Ondoh M've

FRANCE

D. Silvestre

GHANA

M. A. Mensah

JAPAN

K. Shima
K. Imamura
M. Aihara
K. Hanafusa
Y. Horinouchi
M. Ito
S. Ikeda
Y. Kondo
S. Maruyama
K. Matsuse
M. Miyahara
T. Mori
H. Nakamura
A. Okuma
M. Okuno
T. Ono
M. Ota
E. Ozaki
K. Sugawara
Y. Ueda
A. Umezawa
T. Watanabe
Y. Yamada

KOREA (REPUBLIC OF)

S. C. Song

MOROCCO

S. Arrour
M. Chourak

RUSSIA

V. Kamentsev

SPAIN

F. Varela Caride
A. Garcia Rebollar
J. L. Echaniz

UNITED STATES

C. J. Blondin
D. M. Ancona
W. E. Dilday
M. McCall
J. McCallum
N. Nasaka
R. Rootes
L. J. Weddig

URUGUAY

O. Mora

OBSERVERS
NON-CONTRACTING PARTIES

CAMEROON

F. Mbayu
P. E. Tabi

COLOMBIA

L. G. Plata

COSTA RICA

M. Fischel R.

MEXICO

J. L. Romero Hicks
A. Madrigal B.

ROMANIA

C. Costache

SENEGAL

A. A. Thiam
B. Dieng

SWEDEN

L. Nyman
J. Thesleff

EUROPEAN COMMUNITY

K. Tanaka
G. Legris
J. Shimizu

TAIWAN FISHERIES

Y. C. Chern
C. D. Hsu
W. M. Tsai

ICCAT SECRETARIAT

P. M. Miyake
P. M. Seidita

Temporary staff

C. Goto
M. Kobayashi

Appendix 3 to Annex 5

Opening Address by Mr. Toshihiko Tsuruoka
Director General, Fisheries Agency of Japan

Mr. Chairman, Commissioners, and participants,

It is my great pleasure to have this opportunity to address and welcome all of you, on behalf of the Government of Japan, at the opening of this ICCAT Working Group meeting.

This meeting has been called according to a decision made at the Twelfth Regular Meeting of the International Commission for the Conservation of Atlantic Tunas held in November, 1991. I would like to extend a warm welcome to all the representatives of the member countries, observers, and the Secretariat staff, many of whom have come a long way to be here at this meeting.

As most of you very well know, the proposal by Sweden to list the Atlantic bluefin tuna in the Appendix of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was finally withdrawn at the CITES Conference held in Kyoto in March of this year, due mainly to the effective joint effort put forth by the ICCAT Contracting Parties to oppose such a proposal.

However, the decision by CITES infers that from now until the time of the next CITES Conference, people will be watching closely the action taken by ICCAT regarding conservation measures on bluefin tuna. If ICCAT fails in taking effective conservation measures, we will be faced again with the problem of a new proposal to include bluefin tuna as an endangered species.

It is very clear that there is no risk of extinction for the bluefin tuna stocks that have been under management by ICCAT for over twenty years. In spite of this, if this stock should be listed in the Appendix of CITES in the future, as a result of a proposal of a country which does not even fish bluefin tuna and which believes that the stock is endangered, and if the stock is treated as if it required the need of such protection, such action will have very adverse effects on all fisheries in the future.

The fishing industry is one that is favorable to the earth's environment, since its aim is to utilize the excess natural resources that are maintained through the biological reproductive process. I believe that human beings have sufficient knowledge to utilize such resources on a sustainable basis in the future.

I sincerely hope that ICCAT will continue its active efforts in taking effective conservation measures in order to achieve the objectives outlined in its Convention.

I also hope that all the Contracting Parties will discuss these important subject matters at length and obtain good results, so as to ensure the effective conservation and management of all tuna stocks, which is the main objective of the Commission.

In closing, I would like to express my sincere wish that your stay in Japan is a pleasant one. Thank you.

Appendix 4 to Annex 5

Resolution
(Adopted by the Commission in Madrid, November 1991)
Concerning Catches of Bluefin Tuna by Non-Contracting Parties*

Whereas it is the objective of the Interna- tional Commission for the Conservation of Atlantic Tunas, established under the International Convention for the Conservation of Atlantic Tunas, to provide for the effective conservation and management of Atlantic tunas;

Whereas the Commission has made recommendations concerning regulatory measures designed to maintain the populations of tuna and tuna-like fishes, including Atlantic bluefin tuna, at levels that permit the maximum sustainable catch;

Whereas the Commission recognizes that the effective implementation of its regulatory measures requires the participation and support of all tuna fishing nations in the Atlantic Ocean;

Whereas several non-Contracting Parties have harvested and continue to harvest Atlantic bluefin tuna outside the regulatory regime of the Commission and contrary to the principles of customary international law, as articulated in the United Nations Convention on the Law of the Sea;

Whereas the Commission has previously addressed appeals to non-Contracting Parties urging them to join the Commission and abide by its regulatory measures;

The International Commission for the Conservation of Atlantic Tunas:

1. Resolves that it should again invite all non-Contracting Parties fishing tuna in the Convention area to join the Commission as a member or to participate as an observer;

2. Resolves that the Contracting Parties should actively seek to encourage non-Contracting Parties fishing tuna in the Convention area to join the Commission as a member or to participate as an observer;

3. Resolves that the Commission should invite all non-Contracting Parties fishing tunas in the Atlantic Ocean to facilitate, during the following year, catch statistics of their fleets of tuna and tuna-like species.

4. Resolves that the Contracting Parties should actively seek to encourage non-Contracting Parties fishing tunas and tuna-like species in the Atlantic Ocean to facilitate the aforementioned statistics.

5. Resolves that all Contracting Parties should, by January 1, 1993, implement measures to collect statistical information for the purpose of ensuring that ICCAT will have at its disposal sufficient annual import and export statistics to ensure proper management and administration of tuna and tuna-like species. Taking into account the specific problems of the western bluefin tuna stock, these measures for that species will be adopted by Contracting Parties within six months.

6. Given the shared concerns of Contracting Parties as to the western Atlantic bluefin tuna stock, requests that the Executive Secretary convene a specific working group before the 1992 ICCAT meeting to develop the technical details for implementation of this resolution, to accomplish the following:

   -- obtain and compile all available information on the fishing activities of non-Contracting Parties, including details on the type, flag and name of vessels and reported or estimated catches by species and area;

   -- obtain and compile all available information on landings and transshipments of fish caught

* Annex 11 to the Proceedings of 1991 Commission Meeting

by non-Contracting Parties, including details on the name and flag of the vessels; the quantities landed and transshipped, and the countries' landing ports through which the product was shipped;

-- review recommendations to prohibit the transfer at sea of western Atlantic bluefin tuna between vessels from different countries;

-- consider and outline measures to prevent the re-flagging of vessels of Contracting Parties for the purpose of avoiding fisheries management measures established by the Commission;

-- recommend measures to the Commission. The Contracting Parties will ensure that these measures will be consistent with the General Agreement on Tariffs and Trade (GATT).

Appendix 5 to Annex 5

Aide-Memoire
prepared by the ICCAT Working Group on Tuna Catches by Non-Contracting Parties

The International Commission for the Conservation of Atlantic Tunas (ICCAT) was established in 1966 *inter alia* for the conservation of tuna and tuna-like fishes in the Atlantic Ocean.

In respect to the relevant provisions of the 1982 United Nations Convention on the Law of the Sea, all States have the duty to take, or to cooperate with other States in taking, such measures for their respective nationals as may be necessary for the conservation of the living resources of the high seas.

ICCAT manages numerous important tuna and tuna-like species in the Atlantic Ocean and adjacent seas. While many of these stocks are not under specific quotas, nevertheless the information provided by the Contracting Parties to ICCAT on the catch by their vessels is essential for the scientific work of the Commission so that on the basis of scientific evidence, recommendations can be made regarding resources designed to maintain the populations of tuna and tuna-like fishes that may be taken in the Convention area at levels which will permit the optimum sustainable catch.

One particular stock that is under quota is the western Atlantic bluefin tuna. Quota limitations were imposed on Contracting Parties fishing this stock in 1982. Since that time, imports into Japan of this species, from non-Contracting Parties, have increased at least 20 fold. Japan, a Contracting Party of ICCAT, is the primary market for bluefin tuna.

Japanese import statistics for 19__ indicate that a total of ____metric tons of bluefin tuna was imported from non-Contracting Parties to ICCAT. A total of ____ metric tons of this amount is recorded as originating in ____.

This large quantity of bluefin tuna, being caught outside of the ICCAT framework, is cause for concern for all Contracting Parties of ICCAT as the necessary catch data are unavailable to the ICCAT scientific body for use in assessments of the stock. Contracting Parties to ICCAT, therefore, call on those non-Contracting Parties whose vessels are catching bluefin tuna to provide the ICCAT Executive Secretary with the required catch and effort data, necessary for the effective scientific assessment of the bluefin tuna stocks in the Atlantic Ocean and adjacent seas.

Appendix 6 to Annex 5

**Recommendation by the Working Group,
Concerning Tuna Fishing Activities
by Non-Contracting Parties**

I. Fishing for bluefin tuna by vessels of non-Contracting Parties could negatively affect the conservation and management measures established by ICCAT if those countries do not cooperate with ICCAT;

II. The magnitude of effort and harvests by vessels of non-Contracting Parties is significant but not yet fully known, although many non-Contracting Parties already report their data. However, national regulations of these countries affecting bluefin tuna conservation and management should also be communicated to the commission;

III. It is essential for the conservation and management of bluefin tuna that effort data and level of harvests be known by ICCAT. For this reason and to reinforce the action already taken by the Secretariat, the Contracting Parties should urgently undertake joint diplomatic demarche or other coordinated efforts to encourage non-Contracting Parties that do not cooperate, asking them to provide all available statistics on the same basis as that required for Contracting Parties.

IV. Should these non-Contracting Parties fail to comply with the requests made through diplomatic demarche before the November, 1992, ICCAT Commission meeting, a GATT-consistent process, such as a certificate of origin regime, for collection of statistics from these countries should be developed for review and possible adoption at that Commission meeting. Such certificate would contain the following information:

1. Name of the country issuing the certificate;
2. The country of destination;
3. The name of the exporter and importer;
4. The name of the fishing vessel that harvested the tuna;
5. The area of harvest for each fish in the shipment;
6. The types of product and total weight;
7. The means of transportation;
8. The point of export.

V. The Commission should set up a permanent Working Group to improve the statistical data and define its terms of reference.

ANNEX 6

RECOMMENDATION BY ICCAT CONCERNING THE ICCAT BLUEFIN TUNA STATISTICAL DOCUMENT PROGRAM

Recognizing the special situation of the west Atlantic bluefin tuna stock and the bluefin tuna market:

Taking into account the stringent ICCAT management regime for this stock and the need to adopt complementary measures to ensure its effectiveness;

Recognizing that in this context it is essential to improve the reliability of statistical information on catches of Atlantic bluefin tuna;

Recalling the Resolution Concerning Catches of Bluefin Tuna by Non-Contracting Parties adopted at the Twelfth Regular Meeting of the Commission (in Madrid in 1991);

Recalling further the efforts of the Working Group to Develop Technical Details for the Implementation of the ICCAT Resolution on Non-Contracting Parties, held in Tokyo, Japan in May, 1992;

Being aware that a considerable number of vessels fishing for Atlantic bluefin tuna are registered to nations which are not members of ICCAT;

Taking into account the strenuous efforts which have been undertaken by Contracting Parties to address the problems created by catches of Atlantic bluefin tuna by non-ICCAT member nations;

Considering that some of the non-ICCAT member nations have great difficulty in providing information on the catches of their flag vessels;

Also being aware that this Program may be adapted to the specific regulations established in ICCAT Contracting Parties, as well as in the framework of regional economic organizations;

The International Commission for the Conservation of Atlantic Tunas recommends that Contracting Parties, no later than September 1, 1993, require that all bluefin tuna, when imported into the territory of a Contracting Party or at the first entry into a regional economic organization, be accompanied by an ICCAT Bluefin Tuna Statistical Document which meets the requirements described in the Appendix to this Recommendation.

Appendix 1 to Annex 6

Appendix to the Recommendation Concerning the ICCAT Bluefin Tuna Statistical Document Program

1. The ICCAT Bluefin Tuna Document must contain the following information:

   a. the name of the country issuing the document
   b. the name of the exporter and the importer
   c. the area of harvest of the fish in the shipment (i.e., for the Atlantic Ocean the areas would be the east, west, or Mediterranean Sea)
   d. the gear utilized to catch the fish
   e. the type of product and total weight
   f. the point of export;

   and must be validated by a government official of the flag state of the vessel that harvested the tuna.

However, such a validation may be waived when the following criteria are met by the flag state for the vessel that harvested the tuna:

a. all bluefin tuna available for sale are tagged or included in an ICCAT-accepted logbook or ICCAT-accepted information retrieval system;
b. all information relating to the tag, the ICCAT-accepted logbook or the ICCAT-accepted information retrieval system is compiled by that government;
c. the compiled information is provided in a timely fashion to ICCAT;
d. the compiled information includes that outlined as the above.

ICCAT accepts that an equivalent statistical document program, that ensures the same objectives and provides the same information as the above may be applied. Countries or regional economic organizations will inform the ICCAT Executive Secretary, for appropriate circulation, six months in advance of application, of equivalent statistical document program.

2. Customs or other appropriate government officials will request and inspect all import documentation including the ICCAT Bluefin Tuna Statistical Document for all bluefin tuna in the shipment. Those officials may also inspect the content of each shipment to verify the information on the document.

3. At the initial stage of the program, the document will be required for frozen bluefin products. Prior to implementing this Program for fresh products, several practical problems need to be solved, such as guidelines to ensure procedures to handle fresh products at customs.

4. Implementation of this Program shall be in conformity with relevant international obligations.

5. The effectiveness and practical aspects of the implementation of this Program will be considered by the Commission.

ANNEX 7

RESOLUTION BY ICCAT TO ESTABLISH A PERMANENT WORKING GROUP FOR THE IMPROVEMENT OF ICCAT STATISTICS AND CONSERVATION MEASURES AND THE TERMS OF REFERENCE OF THE WORKING GROUP

Recalling the Resolution Concerning Catches of Bluefin Tuna by Non-Contracting Parties adopted at the Twelfth Regular Meeting of the Commission in 1991 and the actions taken pursuant to it;

Taking in account the recommendations made by the Working Group to develop technical details for the implementation of the ICCAT Resolution on the Catches of Bluefin Tuna by Non-Contracting Parties, which met in May, 1992, in Tokyo;

Considering that some of the non-ICCAT member nations have great difficulty in managing the fishing vessels registered to them and cannot provide the catch statistics to the Commission;

Being aware that a considerable number of vessels fishing for tuna in the Atlantic Ocean are registered in nations which are not members of ICCAT;

Recognizing that a significant amount of Atlantic bluefin tuna caught by non-member nations is coming via member nations to the market of final destination; and

Further recognizing that it is essential, in taking effective management measures, to improve the reliability of ICCAT statistics of Atlantic bluefin tuna catches by both member and non-member nations;

The Commission resolves to establish a Permanent Working Group, with the following terms of reference:

1. To obtain, compile and review all available information on the tuna fishing activities of Non-Contracting Parties, including details on the type, flag and name of vessels and reported or estimated catches by species and area;

2. To obtain, compile and review all available information on landings and transshipments of bluefin tuna caught by Non-Contracting Parties, including details on the name and flag of the vessels, the quantities landed and transshipped, and the countries' landing ports through which the product was shipped;

3. To obtain, compile and review all available trade data regarding bluefin tuna and other related information to be obtained from trade statistics of the Contracting Parties and from implementation of the ICCAT Bluefin Tuna Statistical Document Program;

4. To consider the effectiveness and practical aspects of the implementation of the ICCAT Bluefin Tuna Statistical Document Program.

5. To review and make recommendations for improvement of ICCAT statistics regarding Atlantic bluefin tuna catches in light of trade data and related information mentioned in point 3 above;

6. To develop recommendations to control the transfer at sea of Atlantic bluefin tuna between vessels from different countries;

7. To consider and outline measures to prevent the re-flagging of vessels of Contracting Parties for the purpose of avoiding fisheries management measures established by the Commission; and

8. To recommend measures to the Commission based upon the findings of the Working Group's activities. Parties will ensure that these measures conform to their trade obligations.

ANNEX 8

RESOLUTION BY ICCAT REGARDING THE REFLAGGING OF VESSELS TO AVOID COMPLIANCE WITH INTERNATIONALLY AGREED CONSERVATION AND MANAGEMENT MEASURES FOR LIVING MARINE RESOURCES

The Commission:

Noting that among the objectives of the International Commission for the Conservation of Atlantic Tunas is to ensure the effective conservation and rational management of tuna and tuna-like fishes in the Atlantic Ocean, including the adjacent seas,

Recognizing that, under Article 117 of the United Nations Convention on the Law of the Sea, all States have the duty to take, or to cooperate with other States in taking, such measures for their respective nationals as may be necessary for the conservation of the living resources of the high seas;

Mindful that the reflagging of vessels as a means of avoiding internationally agreed conservation and management measures for living marine resources seriously undermines the effectiveness of such measures;

Endorses the decision of the United Nations Conference on Environment and Development to call upon States to take effective action, consistent with international law, to deter reflagging of vessels by their nationals as a means of avoiding compliance with internationally agreed conservation and management measures for fishing activities on the high seas; and

Encourages all countries to move forward as quickly as possible to undertake the negotiation of an international agreement on this matter.

ANNEX 9

REPORTS OF THE MANAGEMENT REVIEW COMMITTEE FOR WEST ATLANTIC BLUEFIN TUNA

Report of the First Meeting

(Tokyo, Japan - May 22 and May 25, 1992)

1.1 The Management Review Committee for West Atlantic Bluefin Tuna was created in accordance with the "Recommendations (made in 1991) for Enhancement of the Current Management of Western Atlantic Bluefin Tuna" (Annex 7 to the Proceedings of the 1991 Commission Meeting). The terms of reference were to discuss approaches for implementing the measures and reviewing the status of western Atlantic bluefin catches and to consider a possible reduction of the fishing level to 50 percent of the 1991 scientific monitoring quota to allow for a more rapid rebuilding of the western Atlantic bluefin tuna stock. The Committee was comprised of representatives of the Contracting Parties whose nationals have been actively fishing for bluefin tuna in the western Atlantic.

1.2 The first meeting of the Management Review Committee, which was called by the Commission, met on May 22 and 25, 1992, at the Conference Room of the Japan Overseas Fishery Cooperation Foundation, in Tokyo, Japan, at the invitation of the Japanese Government. The meeting was attended by the Commissioners of Canada, Japan, and the United States, and their respective advisors, and the ICCAT Secretariat staff (see attached List of Participants.) The meeting was opened by Dr. P. M. Miyake, Assistant Executive Secretary of the Commission, on behalf of the Dr. A. Fernández, ICCAT Executive Secretary. Dr. P. M. Miyake served as Rapporteur for the meeting. Mr. Kazuo Shima of Japan was elected Chairman.

1.3 The Management Review Committee concluded that ICCAT Contracting Parties should improve knowledge on bluefin tuna biology so as to carry out better stock assessments and the Committee endorsed full implementation of the ongoing ICCAT Bluefin Year Program.

1.4 The Committee concluded that:

A. The magnitude and effort by vessels fishing western Atlantic bluefin tuna is significant but not yet fully known although many countries already report their data. The inadequacy of the current ICCAT data reporting process negatively affects the conservation and management of western Atlantic bluefin tuna that have been established by ICCAT;

B. It is essential for the conservation and management of western Atlantic bluefin tuna that all effort data and levels of harvest be known by the Management Review Committee and by ICCAT;

C. A GATT-consistent statistical collection system must be implemented to ensure that statistics related to the levels of effort and harvest of western Atlantic bluefin tuna are available to the Management Review Committee and to ICCAT.

1.5 Based upon these conclusions, the Management Review Committee identified the following actions:

Canada, Japan and the United States will undertake to implement by January 1, 1993, the following measures to improve the collection of statistical information for the purpose of ensuring that ICCAT will have sufficient annual catch data:

A. Require their fishermen (both commercial and recreational) to tag all Atlantic bluefin tuna harvested and available for sale.

B. Implement a system whereby imports of all bluefin tuna be accompanied by a certificate of origin

issued by the flag state of the vessel that harvested the tuna and containing the following information:

C. Name of the country issuing the certificate;

1. The name of the exporter and importer;

2. The area of harvest for each fish in the shipment (i.e., for the Atlantic Ocean whether it is the east Atlantic, the west Atlantic or the Mediterranean Sea;

3. The types of product and total weight;

4. The point of export.

Each of the three parties will conclude its examination of the consistency of the above measures with their obligations under the General Agreement on Tariffs and Trade (GATT) and will exchange views by August 1, 1992. As soon as the three parties reach a consensus on such measures, a joint diplomatic demarche will be made to notify countries harvesting bluefin tuna that the above certificate of origin regime will be implemented, to provide details of the regime, and to seek their support.

To facilitate the introduction of a certificate of origin regime, Canada, Japan and the United States undertake to:

-- Design a certificate of origin form for the guidance of exporters;
-- Prepare and circulate a document to ICCAT Contracting Parties explaining the rationale for the regime, why it is consistent with obligations under the GATT, and what is required to ensure compliance with the regime;

Failing consensus, the three parties will convene another meeting before October 1, 1992.

1.6 Further to the terms of reference for the Management Review Committee, Canada, Japan, and the United States reviewed the measures for conservation and management of western Atlantic bluefin tuna, agreed to at the 1991 ICCAT meeting, which included the following:

A. For 1992 and 1993, a 10 percent reduction in the scientific monitoring quota;

B. For 1994 and 1995, up to a 25 percent reduction in the scientific monitoring quota, based upon the review of the SCRS; and

C. A consideration of a 50 percent reduction in the scientific monitoring quota to ensure a more rapid rebuilding of the stock.

1.7 After reviewing the possible reduction of fishing level to 50 percent of the 1991 scientific monitoring level to allow for a more rapid rebuilding of the stock, the Committee concluded that it would consider readjustments in the scientific monitoring quota along the lines of the above measures and consistent with the scientific advice of the SCRS, at the 1993 ICCAT annual Commission meeting.

1.8 The Management Review Committee adopted this report, with the understanding that until it has been discussed by the Commission, distribution should be limited to the ICCAT Contracting Parties only.

1.9 The Committee thanked the Government of Japan for hosting the meeting and commended Mr. Shima's excellent chairmanship. The meeting of the Management Review Committee was adjourned.

List of Participants at the
First Meeting of the Management Review Committee
for the West Atlantic Bluefin Tuna

CANADA

J. E. Haché
C. J. Allen
B. O'Brien
P. T. T. Swim
D. Rideout
P. Robertson

JAPAN

K. Shima
M. Aihara
K. Hanafusa
M. Miyahara
T. Mori
A. Okuma
M. Okuna
M. Ota
E. Ozaki
K. Seki
Y. Soeda

JAPAN (Continued)

Mr. Sugiyama
Z. Suzuki
D. Umezawa
T. Watanabe

UNITED STATES

C. J. Blondin
D. M. Ancona
W. E. Dilday
M. McCall
M. Montgomery
J. McCallum
R. Moore
N. Nasaka
R. Rootes
L. J. Weddig

ICCAT SECRETARIAT

P. M. Miyake
P. M. Seidita

Report of the Second Meeting
(Washington, D. C.- September 11, 1992)

1.1 As a result of the meeting of the Management Review Committee for West Atlantic Bluefin Tuna in Tokyo, Japan, May 22 and 25, 1992, Canada, Japan and the United States undertook a number of actions to facilitate the improved collection of data and statistics on bluefin tuna. In order to coordinate the efforts outlined in the Report of the Management Review Committee, May 22 and 25, 1992, Canada, Japan and the United States met in Washington, D.C. on September 11, 1992.

1.2 The meeting was attended by the Commissioners of Canada; Japan, and the United States, and their respective advisors. The ICCAT Secretariat staff was invited but unable to attend (see List of Participants). The meeting was chaired by Mr. C. Blondin and Ms. B. Rootes served as Rapporteur for the meeting.

1.3 Mr. Blondin briefly summarized the joint diplomatic efforts of Canada, Japan, and the United States since the May ICCAT meetings in Tokyo. These efforts include the coordinated delivery of an Aide Memoire to 14 countries who currently are not members and do not participate in ICCAT but who trade in bluefin tuna and presumably in western Atlantic bluefin tuna. The text of a sample Aide Memoire delivered to the non-member countries is attached as Appendix 1 to Annex 9. In addition, the Commissioners from Japan and the United States travelled to two of the principal countries believed to be serving as flag of convenience states and personally encouraged the involvement of the concerned governments in the responsible management of their respective fleets. The government officials of such two countries unequivocally explained their lack of means to collect catch statistics from the reflagged tuna fishing fleet and expressed their support for introduction of an import monitoring system using a certificate of origin. The Commissioners reported that it is unclear what actions will be undertaken as a result of these efforts. A full report of the joint efforts of the three countries taken pursuant to the Recommendations of the Working Group on Tuna Fishing Activities by Non-Contracting Parties will be made at the November ICCAT meeting.

1.4 The Review Committee then reviewed the text of a document that outlined a certificate of origin program and that had been prepared by the staffs of the three participating Governments. The final text is attached as Appendix 2 to Annex 9. This text is hereby forwarded to the ICCAT Secretariat for circulation to the ICCAT member countries in order that it may be reviewed and considered by the ICCAT countries for action at the November 1992 ICCAT meeting.

1.5 The Bluefin Year Program was raised by Japan and the need for involvement and support by the ICCAT countries was stressed and supported by Canada, Japan, and the United States.

1.6 The Management Review Committee agreed to meet just prior to the 1992 ICCAT meeting and will set the date through correspondence. The Committee reviewed and adopted this report through correspondence, for presentation at the November ICCAT Commission Meeting.

List of Participants at the
Second Meeting of the Management Review Committee
for the West Atlantic Bluefin Tuna

CANADA

J. E. Haché
D. Angell
B. Morrisey
J. Prevost
D. Rideout

JAPAN

K. Shima
M. Yokoyama
M. Miyahara

JAPAN (Continued)

K. Kagawa
F. Yawata

UNITED STATES

C. J. Blondin
B. Hallman
B. Rootes
D. Stone
M. McCall
J. Early
A. Pesok
D. Balton
D. Burinsa

Appendix 1 to Annex 9

Aide-Memoire
(As was prepared by the ICCAT Working Group on Tuna
Catches by Non-Contracting Parties)

The International Commission for the Conservation of Atlantic Tunas (ICCAT) was established in 1966 *inter alia* for the conservation of tuna and tuna-like fishes in the Atlantic Ocean.

In respect to the relevant provisions of the 1982 United Nations Convention on the Law of the Sea, all States have the duty to take, or to cooperate with other States in taking, such measures for the respective nationals as may be necessary for the conservation of the living resources of the high seas.

ICCAT manages numerous important tuna and tuna-like species in the Atlantic Ocean and adjacent seas. While many of these stocks are not under specific quotas, nevertheless the information provided by Contracting Parties to ICCAT on the catch by their vessels is essential for the scientific work of the Commission. On the basis of scientific evidence, recommendations can be made regarding resources designed to maintain the populations of tuna and tuna-like fishes that may be taken in the Convention area at levels which will permit the optimum sustainable catch.

One stock under quota is the western Atlantic bluefin tuna. Quota limitations were imposed on Contracting Parties fishing this stock in 1982. Since that time, imports into Japan of this species from non-Contracting Parties have increased at least 20 fold. Japan, a Contracting Party of ICCAT, is the primary market for bluefin tuna.

Based on the data of Japan Export and Import, Commodity by Country, 1991, a total of 2,948 metric tonnes of bluefin tuna is estimated to be imported to Japan from non-Contracting Parties to ICCAT. Among

this amount, a total of ___ metric tons is figured as originating in ____.

This large quantity of bluefin tuna, caught outside of the ICCAT framework, is cause for concern for all Contracting Parties of ICCAT as the necessary catch data are unavailable to the ICCAT Standing Committee on Research and Statistics for use in assessments of the stock. Canada, Japan, and the United States, as Contracting Parties to ICCAT, therefore call on _____ to provide the ICCAT Executive Secretary with the catch and effort data, including location and method of capture, necessary for the effective scientific assessment of the bluefin tuna stocks in the Atlantic Ocean and adjacent seas.

The catch data is required as soon as possible, but the ICCAT scientists need to have it by September 1st in order to include it in the scientific evaluation of the status of the stock, which will be made this fall in preparation for the next meeting of the ICCAT Standing Committee on Research and Statistics November 2-6, 1992, in Madrid, Spain.

Appendix 2 to ANNEX 9

Canada-Japan-United States
Certificate of Origin Program for Bluefin Tuna

Purpose

The following paper describes a certificate of origin regime for bluefin tuna that will be implemented by Canada, Japan, and the United States on January 1, 1993. The three countries are members of the International Commission for the Conservation of Atlantic Tunas (ICCAT), which comprises twenty-two Contracting Parties. Other ICCAT Contracting Parties may also implement this certificate of origin regime for bluefin tuna. The purpose of the program is to collect statistics regarding all Atlantic bluefin tuna.

Background

In November, 1991, ICCAT adopted a Resolution Concerning Catches of Bluefin Tuna by non-Member Countries which resolved that all ICCAT Contracting Parties implement by January 1, 1993, measures to collect statistical information for the purpose of ensuring that ICCAT will have at its disposal sufficient annual import and export statistics to ensure proper management and administration of tuna and tuna-like species. A Working Group meeting was then convened in Japan, May 19-22, 1992, to develop the technical details for implementing the resolution. The Working Group recommended that ICCAT member countries should urgently undertake joint diplomatic demarches or other coordinated efforts to encourage non-Contracting Parties to provide all available statistics on the same basis as that required for Contracting Parties.

On May 22 and 25, 1992, ICCAT convened a meeting in Tokyo between the members of the Western Atlantic Tuna Management Review Committee made up of Canada, the United States and Japan. This Committee identified that the three countries undertook to implement by January 1, 1993, a requirement that imports of all bluefin tuna be accompanied by a certificate of origin issued by the flag state of the vessel that harvested the tuna. The certificate of origin system is necessary because of insufficient cooperation by non-Contracting Parties to supply ICCAT with statistics on tuna harvests. It will better facilitate the collection of statistics concerning the harvests of bluefin tuna.

During the summer of 1992, Canada, Japan, and the United States, after extending an offer to coordinate with other ICCAT member countries, initiated coordinated demarches to a total of 14 countries including a personal envoy consisting of the respective ICCAT Commissioners to the countries of Honduras and Panama. Following little or no data provided from the majority of countries contacted, Canada, Japan, and the United States met to discuss further the details of the program to collect information and statistics on all bluefin tuna products entering their markets.

This program can be implemented consistent with obligations under the General Agreement on Trade and Tariffs, by reason that the purpose of this program is to collect catch information necessary for the proper

conservation and management of Atlantic bluefin tuna, and that requirement of submission of certificate of origin is "strictly" indispensable for this purpose.

OPERATION OF THE SYSTEM

Certificates

1. It is required that all bluefin tuna, when entering into countries participating in the program, be accompanied by a certificate of origin.

2. Certificates of origin must contain the following information:

a. the name of the country issuing the certificate;
b. the name of the exporter and importer;
c. the area of harvest for each fish in the shipment (i.e., for the Atlantic Ocean the areas would be the east, west, or Mediterranean Sea);
d. the types of product and total weight;
e. the point of export.

3. Two types of certificates will be recognized under this program: Type A and Type B. A Type A certificate is one that is validated by a government official of the flag state for the vessel that harvested the tuna and which contains the information outlined in paragraph 2. A Type B certificate must also contain the above information and be validated but not necessarily by a government official. However, a Type B certificate will be acceptable only when the following criteria are met by the flag state for the vessel that harvested the tuna:

a. all bluefin tuna available for sale are tagged;
b. all information relating the tag to the fish is compiled by that government;
c. the compiled information is provided in a timely fashion to ICCAT;
d. the compiled information includes that outlined in paragraph 2.

Customs

4. Customs or other appropriate government officials will request and inspect all import documentation including certificate(s) of origin for all bluefin tuna in the shipment. Those officials may also inspect the contents of each shipment to verify the information on the certificate. Uncertified bluefin tuna will be suspended entry until such time as an appropriate certificate is completed and provided to the appropriate government officials *. In order to facilitate the customs handling of Type B certificates -- only when exporting and importing country governments concur -- fish products without an attached tag will be refused entry **.

DOMESTIC PROGRAMS

American, Canadian, and Japanese fishermen will be required to tag the carcass of each Atlantic bluefin tuna that is available for sale. Fish not available for sale will be tagged or otherwise accounted for. The harvest information will be provided to ICCAT. Such a system when coupled with certificates of origin is much more onerous than the certificate of origin regime but greatly enhances the data received by ICCAT. All harvesters of bluefin tuna are encouraged to consider voluntary use of carcass tags (in association with fisherman logs) as the additional information would be beneficial to ICCAT scientists.

Documents explaining the specifics of the domestic programs of each of these three countries are available upon request.

---

* It should be noted that a certificate of origin will be required for frozen bluefin products at the initial stage of this program. Prior to implementing this program for fresh products, several practical problems need to be solved, such as avoidance of quality deterioration and establishment of guidelines to ensure procedures to handle fresh products at Customs.

** The Governments of Canada, Japan, and the United States share the view that Atlantic bluefin tuna products harvested by their flag vessels will be handled in this manner. Such arrangements are to be encouraged.

ANNEX 10

REPORT OF THE MEETINGS OF PANELS 1-4

Report of the Meeting of Panel 1

1. Opening

Dr. L. Koffi (Côte d'Ivoire), Chairman of the Panel, opened the meeting of Panel 1.

2. Adoption of Agenda

The Agenda was adopted without change and is attached as Appendix 1 to Annex 10.

3. Election of Rapporteur

Dr. P. Pallarés (Spain) was elected rapporteur.

4. Review of Panel Membership

The Panel is currently comprised of 16 countries, after the withdrawal of Cuba from the Commission: Angola, Brazil, Cape Verde, Côte d'Ivoire, France, Gabon, Ghana, Japan, Korea, Morocco, Portugal, Russia, Sao Tomé and Principe, Spain, United States and Venezuela.

Three countries were absent from the meeting: Angola, Cape Verde, and Gabon.

5. Report of the Standing Committee on research and Statistics (SCRS)

The SCRS Chairman, Dr. J. L. Cort (Spain), summarized the conclusions of the Committee concerning yellowfin and skipjack.

5.a Yellowfin tuna

As a basis for the assessments, the hypothesis of the existence of two independent yellowfin stocks, in the eastern and western Atlantic (separated at 30°W), was accepted. However, during 1991, eight new transatlantic recoveries of tagged yellowfin were reported. They were large yellowfin tuna tagged off the east coast of the United States and recovered in the eastern Atlantic near the equatorial area, which would confirm the existence of mixing of adult yellowfin in the western and eastern Atlantic; however, the mixing rate is at present difficult to quantify.

An overall assessment was made of the eastern Atlantic stock using the generalized production model and the non-equilibrium production model, and an analytical assessment was made through virtual population analysis (VPA). The production models fitted to the nominal catch and effort data, with an assumption of an annual increase of 3 percent in the fishing power of the boats since 1980, showed that catches for the last three years were above the MSY, estimated at 117,000 and 115,000 MT, depending on the model used, and that an effort in 1991 was near or slightly above the optimum effort estimated by the models. Between the different runs made for the different measures of effort, the former solution was the one the Committee accepted, by considering that it was the one that best reflected the real situation, as it took into account an increase in the fishing efficiency of the purse seiners resulting from the improved techniques which have continuously been introduced in the fleets.

The results of the VPA showed stability in fishing mortality and the biomass in the juvenile and pre-adult stocks, and an increase in fishing mortality on adults in

the last few years. These results did not change the conclusions on the minimum size which were derived from the last yield-per-recruit analyses.

As for the western Atlantic stock, although the Data Preparatory Meeting for Southwest Atlantic Tunas and Tuna-like Fishes signified a great improvement in the availability and processing of data from the fisheries of this part of the Atlantic, no assessment of this stock has yet been made. However, it is now possible to carry out this assessment, and this is one of the objectives of the Working Group proposed by the SCRS.

After the explanation by the SCRS Chairman, the Delegate of the United States called attention to the level of exploitation of the eastern Atlantic stock.

5.b Skipjack

The SCRS Chairman reported that two management units are considered for the eastern and western Atlantic, with a very low mixing rate.

In the eastern Atlantic, the catches in 1991 reached a historical record with 163,500 MT; these high catches are due to the increase in the catches by the purse seine fishery (70 percent over the 1990 level), as a result of the massive placement by this fleet of artificial floating objects equipped with beacons. As a consequence of the development of this type of fishing, the fishing grounds have been expanded. The sizes of fish caught in this fishing method are similar to those caught from schools not associated with floating objects.

The SCRS did not make an assessment of the stock; however, it has analyzed the changes in different parameters of the fishery. The current effort level in comparison to the effort exerted on the stock in 1983 when the last assessment was made, can be very different from the level as indicated by the carrying capacity (28 percent lower). Due to the increase in purse seine fishing efficiency in the last few years, the real effort can be considerably higher than indicated by the current carrying capacity, especially in 1991 with the development of fishing with floating objects.

As for the western Atlantic, the catch rates remained stable in all the fisheries, and no significant changes were observed either in catches or in effort.

6. Measures for the Conservation of Stocks

6.a Yellowfin tuna

Several interventions were made under this Agenda Item.

The Panel Chairman reviewed the ICCAT regulation that prohibits the landing of yellowfin weighing less than 3.2 kg. Given the little effect that this measure has had on the mortality of juveniles, some doubts were expressed on continuing this minimum size regulation. The SCRS Chairman spoke on the need to maintain it.

Based on the conclusions of the east Atlantic stock analysis, the Delegate of the United States indicated his concern on the stock status and on the consequences that a shift in effort towards the west could have on the western stock. Consequently, he proposed a freezing of effort in the entire Atlantic at the 1991 level, and expressed the necessity of a group to monitor yellowfin.

The SCRS Chairman reported that his Committee identified the necessity of creating a Yellowfin Assessment Working Group and recommended that a meeting of this Group be held next year.

The Delegate of Spain noted that there is no increasing trend in effort because according to the 1992 data, part of the Spanish purse seine fleet has returned to fishing in the Indian Ocean.

The Panel Chairman asked the different delegations to give their opinions on the proposal of the United States concerning the freezing of effort at the 1991 level.

After this consultation, Panel 1 decided to maintain in effect the minimum size limit of 3.2 kg for yellowfin and to wait for the results of the Yellowfin Assessment Working Group before recommending new management measures for yellowfin.

6.b Skipjack

As for skipjack, the United States Delegate indicated his concern on the eastern Atlantic stock after the expansion of fishing with floating objects. Nevertheless, no management measures were suggested due to the lack of analysis on this species.

7. Research

Panel 1 reviewed the SCRS recommendations for yellowfin and skipjack, and supported the research activities recommended by the SCRS. Special attention was drawn to the recommendation on the formation of a Yellowfin Assessment Working Group. This group will meet in the "Centro Costero de Tenerife del Instituto Español de Oceanografía" during 1993.

8. Date and Place of the Next Panel Meeting

Panel 1 agreed to meet at the same time and place as the next Commission meeting.

9. Other Matters

No other matters were discussed.

10. Adoption of Report

While adopting the Report of Panel 1, the Delegate of Venezuela asked that a statement be included in the Report. The statement was very long and due to time constraints, it was distributed among the delegates in the original language only and it was not discussed. The Report of Panel 1 was adopted.

11. Adjournment

The meeting was adjourned.

Report of the Meeting of Panel 2

1. Opening

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

2. Adoption of Agenda

The Agenda was adopted without change and is attached as Appendix 1 to Annex 10.

3. Election of Rapporteur

Mr. W. B. Folsom (United States) was designated rapporteur.

4. Review of Panel Membership

All the Panel members, i.e., Canada, France, Japan, Korea, Morocco, Portugal, Spain, and the United States, were present.

5. Report of the Standing Committee on Research and Statistics (SCRS)

The Chairman of the Standing Committee on Research and Statistics (SCRS), Dr. J. L. Cort (Spain), reviewed and summarized the SCRS work on bluefin and albacore tunas.

5.a Bluefin

In 1990, the Commission decided to conduct assessments of the western and eastern bluefin tuna stocks in alternate years. Accordingly, at its 1992 meeting, the SCRS focused on the status of the bluefin tuna stock in the eastern Atlantic Ocean, including the Mediterranean Sea. Between 1970 and 1978, an average of 45 percent of the catches from the east Atlantic required sizing with samples taken from other fisheries, but from 1979-91, the average percentage was considerably smaller (16 percent), indicating an improvement in the sampling program for these fisheries. In the Mediterranean, however, an average of 50 percent of the catches made from 1970-1991 required sizing with samples taken from other fisheries. The estimated catch at age, through age 15+, is shown in the SCRS Report (BFT-Table 3). The highest proportion (about 90 percent in number of fish) of the catch of east Atlantic and Mediterranean bluefin tuna is comprised of juvenile fish ages 0-4 years. In general, fish in this age category are not spawners, and thus are being harvested before contributing to the reproductive success of the stock. Catches of age-0 fish are very likely under-estimated, and sporadic studies show that these catches are important.

The 1982 year-class was the largest estimated for the 1970-91 period. This cohort has now passed into the oldest age category (i.e., entering the age 10+ class in 1992) and has already been fished fairly heavily. There is no evident trend in recruitment (age-class 1). The estimated fishing mortality rates for this age group are relatively high. Estimates of stock size for ages 2-4 in the base case of the SCRS assessment have also shown variability over the 1970-91 time period, although this variability is less than that observed for age-1 fish. Estimates of the fishing mortality rate on this age group have also shown variability, although there has been an increasing trend in estimates of F. Estimates of abundance of fish aged 5-9 also show variability that may, in part, reflect the passage of relatively strong cohorts through the age group (the 1982 cohort was part of this age group from 1987-91). The average abundance for the most recent period was also equal to the average for the 1980-84 period. Fishing mortality rate estimates for this age group are also variable, but are lower than the rates estimated for both younger and older fish. Abundance estimates for the oldest fish in this stock (ages 10 and older) have shown a consistent downward trend since 1970. The 1982 cohort entered into this age group in 1992.

Overall, the average estimated abundance of fish in this age group for the period 1990-92 was about one-third of the average estimate for the 1970-72 period on this age group. Estimates of F on this age group from the base case assessment increased during this period.

The Delegate of the United States complimented Dr. Cort and the SCRS for their work. The U.S. Delegate, referring to the catch of bluefin tuna (BFT-Table 1 of the SCRS Report), noted that "catch" as well as "discards" are included in the total bluefin catch data. Since the term "total catch" generally refers to fish that are caught and retained, this makes it appear that the United States has exceeded its total catch quota, but this is not the case. In the future it might be helpful for all ICCAT Contracting Parties to include discards in their total catch figures. The United States Delegate noted that bluefin are sometimes caught as a by-catch after the bluefin tuna fishing season is over and this also applies to the fisheries of other countries. The U.S. Delegate asked that a footnote be added to BFT-Table 1 of the SCRS Report indicating that the United States data include discards. Normally, in fisheries management, discards are not included in quotas, unless specifically addressed. The United States suggested that consideration be given to reporting dead discards separately in the future.

The Japanese Delegate asked the U.S. Delegate to identify those years for which the catch data included discards. He observed that the U.S. suggestion was valid but noted that this procedure has not been practiced by many countries. If ICCAT were to amend its procedure of reporting catches, it would be necessary to decide the year when this process should begin. This is a fundamental question and should be considered by the Commission.

The United States Delegate responded that the U.S. has been reporting discards for several years, at least from the mid-1980's when it began a two-tier system. He expressed that this could be accomplished by use of a separate statistical table. The U. S. Delegate also suggested that ICCAT scientists try to find a better solution. He proposed that the matter of discards of all harvesting nations, however, be considered in future assessments.

The Canadian Delegate agreed with many of the statements made by the United States. He noted that there are, however, many different philosophies regarding whether discards should be considered as part of the Total Allowable Catch (TAC). He added that once a fish is caught (and killed) it is removed from the stocks and it should be counted as part of the TAC. He also noted that in order for the scientists to know the number of discards, these data should be included in either one or two tables, although a specific table which clearly identifies discards would be preferable.

Dr. Cort noted that this year's SCRS efforts were focused on the assessment of the east bluefin stock and that the SCRS scientists did not consider details of west Atlantic statistics. In 1993, the SCRS will give appropriate attention to the suggestion made by the United States.

The Delegate of Japan, in agreeing with the suggestion made by the United States, questioned whether some confusion could occur if this issue were not carefully examined. For example, in trawl fisheries (especially shrimp trawling) there are discards of many different species. Statistics usually include just the catches of the principal species. He noted that this is also the case in the United States. He added that the United States proposal would have an impact on fisheries statistics all over the world. The Delegate of Japan felt that this issue should also be discussed by a larger international forum, such as the FAO Committee on Fisheries (COFI).

The Delegate of Canada raised two issues: (1) Although the United States Delegation referred to west Atlantic bluefin statistics, scientists need to know the full dimension of the problem of discards. This applies to discards of tuna around the world, but especially in the east Atlantic bluefin fisheries. Scientists need to know if the fish have been retained or discarded and, if discarded, whether alive or dead. (2) Bluefin tuna have been assessed as two separate stocks with limited mixing. The Delegate of Canada asked if this hypothesis was still valid. Should the geographical east-west stock division remain as was defined in earlier years? Has more work been done on this?

The SCRS Chairman responded that the SCRS still works under the hypothesis that there are two separate stocks of bluefin tuna. There is no evidence of genetic exchange between the eastern and western bluefin tuna stocks. The SCRS has studied this issue, based on tagging results, and found little scientific evidence that would justify a change in this hypothesis. There have been, however, examples of tunas that were tagged in the west Atlantic and recovered in the east Atlantic and other examples of mixing could be cited. Usually the mixing between the stocks involves juveniles, and the rate of mixing varies between years.

The Assistant Executive Secretary noted that in the ICCAT data base, the catches reported as retained and those reported as discarded are entered separately. Therefore, the Secretariat can report them separately, possibly during this session, or otherwise before the bluefin catch table is published in the Biennial Report.

The United States Delegate thanked Dr. Miyake and noted that the United States was more concerned about the future than the present. Regarding the points raised by Japan and Canada, the United States noted that discards could be a universal problem. When dealing with a healthy stock, discards might consist of a smaller component, but bluefin tuna is a very depressed stock, which makes collecting improved statistical data more important.

The Delegate of Japan also expressed his country's concern about the mixing of eastern and western stocks of bluefin tuna. The Japanese Delegate asked the SCRS scientists if they could explain the sizes of these stocks using various indices. He noted that Japan once had a large bluefin tuna fishery near Brazil. However, this fishery collapsed and the stock has not yet recovered. The Delegate of Japan asked the SCRS if the spawning ground of that stock had been identified.

The SCRS Chairman explained that various indices are used as part of the stock assessment techniques. He also reported that SCRS scientists received information from Taiwan in 1992 concerning bluefin tuna fishing off the coast of Brazil by Taiwanese longliners.

With regard to the effects of the current regulations, the SCRS Chairman reported that in the east Atlantic the current level of harvest is below that of 1975. In the Mediterranean, until 1991, the catch has remained constant, but exceeded the 1975 level. He further stated that in 1975, it was recommended that fishing mortality on bluefin tuna in the entire Atlantic and Mediterranean be limited to recent levels. Based on estimated F levels for young and oldest fishes, it is apparent that this recommendation has not been met.

The SCRS Chairman noted that a second regulation banned the catch of fish less than 6.4 kg for the entire Atlantic. He noted that the catch of age-0 fish for the east bluefin stock is significantly underestimated and the proportion of these fish in the catch could be much higher than indicated in the official statistics. He further reported that the analysis carried out this year reflects similar patterns as in the 1990 analysis. In spite of uncertainties in the analysis, it is apparent that higher long-term yields could be realized if fishing mortality rates were reduced, especially on young fish. He expressed the Committee's concern about the high catches of small individuals and the Committee recommended that every effort be made so that the current measures on the size limit of 6.4 kg be adhered to. It is expressly recommended that steps be taken so that no age-0 fish (< 1.8 kg) are caught. Not respecting these recommendations could be highly detrimental to the future of the stock.

The Delegate of Spain stated that the bluefin fishery in the Mediterranean has specific characteristics, such as the predominance of the artisanal fishery, the importance of the sport fishery and the fact that there are no Exclusive Economic Zones in the Mediterranean. These characteristics, that are common for the entire Mediterranean, cause some problems as regards the monitoring and would explain, up to a point, the taking of immature fish.

The Delegate of Spain further stated that at the level of the European Community, no common fishing policy has been developed to apply to this area, although work on this matter has advanced considerably. In order to combat these problems, Spain is developing and reinforcing programs of awareness and education for the artisanal fishery sector, in relation to conservation matters and minimum sizes. Likewise, the inspection schemes have been reinforced, both at sea and on land, with respect to commercial as well as sport fishing.

The Delegate of the United States reviewed a number of important points concerning bluefin tuna, including the western stock. Even though this year ICCAT concentrated its bluefin assessment on the eastern management unit, the U.S. remains concerned about the western unit. The Management Review Committee for West Atlantic Bluefin held a meeting (see Annex 9) in early 1992 concerning the western stock. He noted that the process of conserving bluefin tuna stocks in the Atlantic has a long history. Bluefin was the first species recognized as requiring management efforts in ICCAT. It is a complex issue with many complex facets. There have been extensive discussions on whether there are one or two stocks. He added that despite comments made by SCRS scientists, there are still some questions about mixing and transfer of fish between east and west and perhaps a tagging program may provide further bases for study. He commented that ten years ago, ICCAT reduced fishing in the west Atlantic by 50 percent and reduced the catch of small

fish by imposing a further minimum size (120 cm). Despite these efforts, the western stock of bluefin tuna appears to be in decline. The Delegate of the U.S. noted that the slow pace of recovery has come to the attention of many, some of whom question whether ICCAT is fulfilling its conservation responsibilities, and has raised the issue as an item of environmental concern to Convention on Trade in Endangered Species of Fauna and Flora (CITES). In 1991, ICCAT agreed to a reduction in the scientific monitoring levels and a ban on the sale of small fish (less than 30 kg or 115 cm). He commented that the United States has fully implemented these recommendations, even though the reduction in the monitoring level can be achieved over a two-year period (1992-1993). Despite actions to date, further reductions of catches to 50 percent of the 1991 level may be needed to rebuild the stocks, depending on the 1993 SCRS assessment and recommendations.

The Delegate of the United States was heartened that some stability has been achieved, especially as concerns the abundance of small and medium fish. However, he noted that there is no clear indication that rebuilding of the large-fish segment of the stock has been achieved and United States scientists project continued reductions in large-fish abundance through 1995. This requires a continued, cautious approach. The Management Review Committee for West Atlantic Bluefin Tuna agreed to consider reductions of as much as 50 percent, dependent on SCRS advice. Further, the United States and others have made commitments at CITES to continue initiatives, with emphasis on a quota reduction, to restore and maintain the Atlantic bluefin populations. In preparation of the 1993 meeting, the United States Delegate asked the SCRS to define the stock size and establish a timetable to achieve this goal. He noted that the U.S. had made the same request last year. He indicated that there are many ways to set a goal. ICCAT's Convention calls for management of stocks to maximum sustainable yield (MSY). Defining MSY depends on a number of factors and will not be easy. But the challenge must be met. Without a target/timetable, the Commission cannot determine if it is making progress. He believed that it is appropriate for the SCRS to establish this target and requested that the SCRS also work on the issue of discards and the question of increased fishing on the eastern stock to determine if this is having an impact on the western stock. The success of the recovery of the west stock, depends on the efforts of all people. The question of the Certificate of Origin is a key part of this recovery program. The U.S. Delegate was deeply concerned that further reductions in catch will have to be made and that the SCRS should consider all factors so ICCAT can make wise decisions on further reductions based on effective science.

The United States Delegate noted his country was disturbed by the incomplete data available for eastern bluefin. Although the United States does not fish in the eastern zone, it is a Contracting Party of ICCAT and therefore shares responsibility for the management of this stock. He noted that over-fishing of the eastern stocks could have an impact on the western stocks and vice versa. The United States Delegate was greatly concerned about the catch of small fish, and noted that 33 percent of the 1991 catch consisted of small fish. There is also a large catch of age-0 fish. He pointed out that the SCRS had recommended that no fish under 1.8 kg be taken and that the catch of age-0 fish could have been even greater than reported. He also noted that fishing mortality of age 2-4 fish of the east stock is two times higher than in 1975. Current mortality rates on larger fish are also higher than in 1975, and the stock size of spawning fish is also smaller. He urged that actions to limit catches be observed and that improved enforcement was needed. The United States Delegate urged the Infractions Committee to consider this issue. He requested that the ICCAT Contracting Parties act before the situation reaches a crisis level. He emphasized that the excessive catch of small fish is a critically important issue and must be brought under control.

5.b Albacore

The SCRS Chairman reported that the albacore stock status was studied using various methodologies, which revealed the same results: an increase in fishing mortality of the young albacore (2, 3, and 4 age groups) during the period analyzed and variation without trend in recruitment. However, when these results were compared to earlier data (1975-82) some inconsistencies were clear. Apparent current recruitment levels seemed to be substantially lower (about 40 percent) than those estimated earlier for the 1975-1982 period. Based on the yield per recruit (ALB-Figures 18-19 of the 1992 SCRS Report), the SCRS felt that the North Atlantic albacore stock could currently be near a highly exploited state. The SCRS also noted that fishing is

focused on immature populations. As for the Mediterranean, there are insufficient data to make any assessments.

6. Measures for the Conservation of Stocks

6.a Bluefin tuna

Mr. K. Shima (Japan) presented the Chairman's Report of the Management Review Committee for West Atlantic Bluefin Tuna which met in Tokyo, Japan, May 22 and 25, 1992. The meeting was attended by representatives of Canada, Japan, and the United States. The Review Committee concluded that ICCAT Contracting Parties should improve their knowledge on bluefin biology and the Committee endorsed further ICCAT programs on bluefin. The Committee also concluded that the magnitude of the fleet and fishing effort of vessels fishing in the west Atlantic were significant, but not fully known. The incompleteness of bluefin data negatively affects the effective management measures established by ICCAT for west Atlantic bluefin tuna. The Review Committee stressed that all data on fishing effort and the levels of harvest should be made available to the Commission so that proper decisions can be reached on stock management. The Review Committee reported that Canada, Japan, and the United States would take action to implement improvements in the collection of statistical information by January 1, 1993, which will require their commercial and recreational fishermen who harvest bluefin tuna for sale, to tag all Atlantic bluefin tuna harvested and will implement a system where imports of all bluefin tuna must be accompanied by a Certificate of Origin issued by the flag state of the vessel and containing information, including the area of harvest. The Committee concluded that readjustments in the scientific monitoring level should be considered at the 1993 Commission meeting. The Report of the Meetings of the Review Committee is attached as Annex 9 to the Proceedings of the Commission Meeting.

The Delegate of France indicated that France was also concerned about the status of bluefin tuna in the eastern and western Atlantic. The French Delegate discussed some of the problems of bluefin fishing in the Mediterranean. He noted that France has fished bluefin tuna for many years in the Mediterranean and believed that considerable progress has been made in controlling the catch of undersized fish. He added that scientific studies should be carried out as regards restricting fishing of bluefin during spawning periods. He suggested that limits be placed on the number of vessels fishing in the region. Finally, the Delegate of France suggested that ICCAT conduct a study on the possibility of regulating fishing gears, especially the length of longlines. He noted that these questions should also be addressed by the non-Contracting Parties.

The Delegate of Spain believed that the suggestion made by the Delegate of France concerning scientific studies in the Mediterranean was a useful one. He also felt that the use of certain types of fishing gears can raise serious problems, specifically mid-water trawls and driftnets.

The Delegate of Japan indicated that he shared many of the views expressed by the U.S. Delegate. However, with respect to the target level of the stock and the timetable to reach it, his country has a fundamental question. Even if a precise target level or size of the stock and a specific schedule are set, can the Commission reasonably expect that such a target will be attained in this set schedule? With the current ability of management and scientific research, Japan believed it was futile to set a precise target and schedule. He stated that the Commission should have a reasonable management objective rather than a precise target. A management objective should be attainable and reasonable. The Delegate of Japan added that in the case of the western Atlantic bluefin tuna, a recovery of the parental biomass in the coming few years is what must be attained. He noted that research activities should be enhanced so that such a change in biomass can be detected in a timely manner, and that setting a far-reaching goal, such as a certain high level to be reached in 15 years, is counter-productive for the effective work of this Commission. The Delegate observed that he would not like to enter into lengthy discussions every year with his U.S. colleagues on whether or not the target can be reached 15 years later.

The Delegate of Japan also pointed out that the most important question on the stock structure of the Atlantic bluefin tuna has yet to be resolved. Despite repeated recommendations by ICCAT on the earliest resolution of this problem, no significant progress was made in the aspect of scientific research. Japan still holds the view that it is more reasonable to regard only one stock existing in the entire Atlantic, in view of the highly migratory nature of this species. He asked the

Panel to note that similar species, such as Pacific bluefin tuna and southern bluefin tuna, have only one stock with wider migratory ranges than the entire Atlantic. He recommended that in this sense, the trans-species studies conducted by the IATTC "World Meeting on the Stock Assessments of Bluefin Tunas: Strengths and Weaknesses" (La Jolla, California, 1990) be reviewed carefully. He added that research activities, such as tagging and recapture, should be intensified as a matter of priority in the Bluefin Year Program to solve this important question.

The Delegate of Japan recalled that in 1974, ICCAT recommended not to increase the fishing mortality of Atlantic bluefin tuna in the entire Atlantic and to prohibit fishing for small bluefin tuna less than 6.4 kg. His country took domestic regulatory measures to implement those recommendations, even though Japanese longliners catch almost no small bluefin tuna less than 6.4 kg. He noted that at that time, a voluntary measure was introduced by Japan to prohibit fishing in the Mediterranean Sea in the spawning season, namely from May 20 to June 30. Since then, the Japanese Government has been sending a patrol boat to the Mediterranean Sea for enforcement of ICCAT management measures every year, except for 1991, when world events prevented the cruise. The patrol boat also provided valuable information on the reflagged fleet activities in recent years.

The Delegate of Japan also recalled that in 1981, ICCAT introduced a severe restriction on the catch of bluefin tuna in the western Atlantic area and at the same time recommended prohibiting a shift in fishing effort for bluefin tuna from the west to the east Atlantic. He reported that, to implement this ICCAT recommendation, Japan established regulatory measures to set a catch limit of 1,600 MT for the directed fishery as well as incidental catch control for the Japanese longliners. He noted that these measures were designed to maintain the total Japanese catch of bluefin tuna in the eastern Atlantic at or below the average catch from 1975 to 1980, i.e., 1,950 MT, as was explained at the 1984 ICCAT meeting. These measures worked to ensure prohibition of a shift of fishing effort from the west to the east Atlantic.

The Delegate of Japan also recalled that in 1985, faced with the increase of the bluefin catch in the Mediterranean Sea, Japan voluntarily introduced a measure to limit the number of Japanese longliners in the Mediterranean Sea to 35 vessels.

The Delegate of Japan also noted that as a result of all those measures, the average Japanese catch of bluefin tuna in the eastern Atlantic in the last ten years has been 1,390 MT, much below the target level of 1,950 MT. The Delegate of Japan indicated that Japan has respected the agreement reached in 1991 on the monitoring quota and that Japan is prepared to review the percentage of reduction scale based on the analysis of the SCRS at its 1993 meeting.

He also noted that at the 1991 Commission Meeting, Japan had proposed a 50 percent reduction in the monitoring quota of western Atlantic bluefin tuna in 1993 and 1994, although a consensus was not reached on the proposal. At that time, Japan stressed the need for taking effective counter measures, parallel to the implementation of the new management measures, against fishing activities of non-Contracting Parties, especially those by re-flagged vessels to avoid compliance with the international conservation measures of ICCAT. He expressed that it was useless to take such a drastic measure as a 50 percent reduction unless the "back door is shut to outsiders".

As regards the introduction of strict management measures, the Delegate of Japan reiterated the importance of introducing measures to restrict fishing activities by non-Contracting Parties so that such vessels cannot fill the void created by strengthening conservation measures for the Contracting Parties. The Delegate of Japan expressed his country's belief that the certificate of origin system, which was developed by the Management Review Committee, was the first step towards dealing with this problem. He indicated that his country strongly supported the introduction of this system by the Commission.

The United States Delegate stated that his country officially accepts that there are two stocks of bluefin tuna, which is the position taken by the Commission. However, the United States Delegate noted that possibly in the future scientists might find it preferable to manage bluefin on a single-stock basis. He recalled that in 1974, ICCAT attempted to limit mortality. The U.S. Delegate observed that in the Mediterranean, about 16,000 MT of bluefin were caught annually in the 1988-1991 period. The U.S. Delegate asked that the Commission look carefully at the catch level of the Mediterranean. He noted that the problem of small-fish harvest is a recognized one. Should there be one stock, then the United States is very concerned because U.S. fishermen have taken extraordinary efforts to protect the western bluefin stock and the U.S. would

be most distressed if others reaped a "windfall" in the eastern Atlantic that may ultimately hurt western fishermen.

The SCRS Chairman summarized the recommendations and the view of the Committee concerning management of the east bluefin stock (including the Mediterranean) as follows:

1. That every effort be made so that the current measures on the minimum size limit of 6.4 be adhered to.

2. That steps be taken so that no age-0 fish (< 1.8 kg) are caught.

3. Not respecting these recommendations could be highly detrimental to the future of the stock.

4. The SCRS noted that the 1975 recommendation to limit fishing mortality to recent levels has not been met.

The Panel examined a number of different proposals concerning research and management of bluefin tuna. Several informal meetings were held until a joint proposal by Canada, the United States, Spain, France, and Japan could be presented. The text of that proposal is as follows:

PROPOSAL BY CANADA, UNITED STATES, SPAIN, FRANCE AND JAPAN ON BLUEFIN TUNA

The Commission proposes that the SCRS be directed to consider and evaluate the effects of various management measures that could be implemented on the east and west bluefin tuna stocks and provide scientifically-based target options for the rebuilding of the stocks in a reasonable period of time.

To clarify the scientific basis of such consideration and evaluation, the SCRS is also instructed to conduct a mid-term review of the progress of the Bluefin Year Program (BYP) and, if appropriate, to recommend action to improve it.

Among possible management measures that could be considered, the Commission directs that the SCRS especially appraise the necessity and convenience of:

a) Establishing in the Mediterranean protection areas and/or periods for the spawners and juveniles;

b) Evaluating the real impact on the target species and by-catch, produced by the gears and equipment used, taking into account the additional mortality not considered in the landing data, as well as the interaction and impact on the catch rates of the different types of fisheries and the involvement of non-member nations.

c) Requiring the reporting of discards for purposes of evaluating their impact on total fishing mortality.

The Chairman of the SCRS provided his evaluation of the proposal, noting that the proposal is in line with SCRS programs and objectives. He noted that many international efforts to reach some of those objectives were already ongoing. The SCRS Chairman noted that some of the items in the proposal would require international consultations. He noted that data in the western Atlantic are quite good, but that data for the eastern Atlantic stock are inadequate. He observed that it might be difficult to reach, in a short period of time, some of the objectives, especially for the east Atlantic stock.

The U.S. Delegate indicated that the task would not be easy, but that reasonable measures were needed. He felt that the SCRS did not always provide ICCAT Commissioners with specific scientific advice, which has led to some problems, given the different viewpoints concerning the intent of SCRS recommendations. He was of the opinion that the SCRS needs to provide more specific and more precise management recommendations, and provide the Commission with a range of options. The United States Delegate thought that the proposal would give the SCRS a good start and that if problems were encountered, then these problems could be addressed at future meetings.

The Panel concurred with the SCRS management recommendations as well as with the Proposal by Canada, United States, Spain, France, and Japan on Bluefin Tuna, and recommended the adoption of these by the Commission.

6.b Albacore

The SCRS Chairman reported that his Committee had not made any management recommendations on albacore stocks, but had requested that the north and south stocks be closely monitored.

The United States Delegate noted that even though the United States is not a major fishing nation for albacore, he is concerned about the SCRS opinion, which indicated that the northern albacore population is at or near the maximum fishing levels, and that southern albacore catch levels are also very high. The U.S. Delegate believed that the Panel needs to give consideration to steps to limit mortality and recommended that the SCRS review this issue next year and formulate recommendations, on which the Panel can consider proper regulatory measures in 1993.

The Delegate of Spain pointed out that albacore is of fundamental importance to the Spanish fisheries. He expressed concern for the status of the stock and the way in which this stock is fished. The Delegate of Spain noted, in this context, that Spain has prohibited its fleet from using driftnets and pelagic trawls, for ecological and environmental reasons, because of the danger to navigation, for lack of selectivity and for producing an unnecessary and useless fishing mortality. However, he emphasized his country's concern about the increasing use of certain gears by other fleets, which clearly hinders the traditional gears, by producing a significant reduction in the catch rates by changing the behavior of the tuna schools. The Delegate of Spain further stated that if the use of driftnets is not prohibited, the technical conditions under which their use is authorized must be scrupulously complied with. The Spanish Delegation also considered that all the catch and effort data on these fisheries should be provided to ICCAT in adequate units so that they can be duly assessed.

The Delegate of France indicated that the issue of driftnets and their impact on tuna stocks will be studied by the United Nations at the end of 1992. The EC Council of Ministers decided on an exception for French vessels, which are allowed to use 5 km nets until the end of 1993, while other countries have to limit their gear to 2.5 kilometers.

7. Research

7.a Bluefin tuna

The SCRS Chairman reported that his Committee recommended *inter alia* several measures on bluefin tuna research. The SCRS recommended that ICCAT carry out the following for the eastern stock of bluefin tuna (all recommendations apply only to eastern bluefin):

1. Set up a joint GFCM/ICCAT *ad hoc* working group as soon as possible, as was proposed at the Second GFCM/ICCAT Consultation in Crete. The SCRS also suggested that a joint GFCM/ICCAT meeting be held just before the meetings of the Atlantic assessment groups in order to carry out an evaluation of the Mediterranean stock.

2. Continue and increase the tagging of juveniles and adults for a better understanding of migration patterns and the exchanges of fish between areas.

3. Improve knowledge on the reproduction biology of bluefin tuna since a review of larval studies in the Mediterranean indicated that bluefin tuna may reproduce in more varied areas than previously believed.

The Panel endorsed these recommendations.

The Chairman of Panel 2, Mr. A. Lahlou, reported that Japan and Morocco had agreed to a research program to breed bluefin tuna. The collection of bluefin eggs off the coast of Morocco is being considered. This joint scientific project by Morocco and Japan would include raising the bluefin until they reach a certain size, and then they will be tagged and released.

7.b Albacore

The SCRS Chairman referred to improvements in the data and information that the scientists used to assess the best estimate of the status of the albacore stock. He summarized a number of recommendations adopted by the SCRS. The Panel endorsed these recommendations.

8. Date and Place of the Next Panel Meeting

Panel 2 agreed to hold its next meeting at the same time and place as the Thirteenth Regular Meeting of the Commission in 1993.

9. Other Matters

In accordance with the proposal by Panel 2 at last year's meeting, France asked the Executive Secretary to inform the Panel members if he had received information on the scientific study financed by the EEC and carried out jointly by the "Institut français de recherche pour l'exploitation de la mer" (IFREMER) and the "Instituto español de oceanografía (IEO). This study was on the interactions of surface gears in the albacore fishery of the northeast Atlantic.

The Executive Secretary reported that this information had been received from the EEC and that it had been communicated to the SCRS Chairman and the rapporteur of the species section on albacore.

10. Adoption of Report

The Report was adopted.

11. Adjournment

The meeting of Panel 2 was adjourned.

Report of the Meeting of Panel 3

1. Opening

The meeting of Panel 3 was opened by the Panel Chairman, Mr L. J. Weddig of the U.S.A.

2. Adoption of Agenda

The tentative agenda was accepted by all delegates, without alteration. The Agenda is attached as Appendix 1 to Annex 10.

3. Election of Rapporteur

Mr A. J. Penney of South Africa offered to serve as rapporteur for the meeting.

4. Review of Panel Membership

All the current Panel members, Brazil, Japan, South Africa, Spain and the U.S.A., were present. There were no requests for any change in membership of the Panel.

5. Report of the Standing Committee on Research and Statistics (SCRS)

5.a Southern Bluefin Tuna

Dr J.L. Cort, Chairman of the SCRS, reviewed the SCRS Report on the state of the southern bluefin tuna stock. The status of the stock was re-evaluated at the Eleventh Tri-Partite Meeting of Australian, Japanese and New Zealand scientists in Japan during 1992. This meeting determined that the parent stock had declined continuously until 1991 and remained low. In contrast, the abundance of juvenile fish has increased since 1986 due to decreased surface fishing effort. Recruitment declined from 1980 to 1985, but improved between 1986 and 1988.

5.b Albacore - South

The only available abundance indices for this stock are those from the Taiwanese longline fishery. These were used in production model assessments of the state of the stock. Equilibrium production model assessments indicated an MSY of 26,000 MT - 27,000 MT. In contrast, recently developed non-equilibrium models indicate an MSY of 20,000 MT and an annual replacement yield of only 15,000 MT. Indications are that MSY levels have been exceeded since 1985 and that the exploitable biomass has been reduced to less than 20 percent of the 1960 biomass level. It was concluded that the southern albacore resource appeared to be over-fished, and that it should be closely monitored using all available assessment methods.

6. Measures for the Conservation of Stocks

6.a Southern bluefin tuna

Japan introduced voluntary limitations on longline fishing for this species in 1971. In 1984 Australia introduced a national quota of 14,500 MT and in 1985 Japan and New Zealand introduced quotas of 23,150 and 1,000 MT respectively. Tripartite Meetings have reduced these quotas between 1987 and 1989 and from 1989 to 1992 quotas of 6,065 MT for Japan, 5,265 MT for Australia and 420 MT for New Zealand have been retained.

The Committee made no recommendation for management of southern bluefin tuna in the Atlantic Ocean, since the stock in the Atlantic is a part of the

total population and it has been monitored by another international body.

Commenting on progress made with the management of southern bluefin tuna, the Delegate of Japan informed the Panel that the Tripartite Meetings were working towards establishing a formal management framework for this species. The basic texts for establishment of a formal management forum had been agreed on during 1992, for implementation during 1993. It was noted that this forum will be open to all concerned nations and that coordination would be established with ICCAT once the forum had been established. Further progress will be reported at the next ICCAT Commission meeting.

6.b Albacore - South

There are currently no management measures for southern albacore. The Chairman noted that no new management measures had been proposed for this stock, but that the SCRS had recommended that it be closely monitored during 1992-93.

The Delegate of the United States expressed concern at the apparent substantial decline in the southern albacore resource and suggested that serious consideration be given to the recommendation of management measures for this stock at the 1993 SCRS meeting. South Africa noted that their fishery was entirely dependant on southern albacore and repeated their concerns expressed at the 1991 Panel meeting. Revised assessments had confirmed 1991 indications that the southern albacore stock was over-exploited and South Africa noted that every effort would be made to conduct additional assessments on the recently created catch-at-size database for this stock, with a view to recommending management measures at the 1993 SCRS meeting.

7. Research

7.a Southern Bluefin Tuna

No research recommendations were made for this species, although it was noted that the ICCAT statistical system will continue to be important for monitoring catches of this species in the Atlantic Ocean.

7.b Albacore - South

Numerous research recommendations were made for both the northern and southern albacore stocks. The most important of these concerned improvements in the catch-at-size and catch-at-age databases and revised analysis of these databases using non-equilibrium production models and tuned VPA assessments.

8. Date and Place of the Next Panel Meeting

At the suggestion of the Panel Chairman, the Panel agreed to hold the next meeting of Panel 3 to coincide with the 13th Regular Meeting of the Commission in 1993.

9. Other Matters

No other matters were discussed.

10. Adoption of Report

The Panel report was adopted without change.

11. Adjournment

The Chairman thanked Dr. Cort for his report and the Panel members for their participation. The meeting of Panel 3 was adjourned.

Report of the Meeting of Panel 4

1. Opening

The Chairman, Mr. F. F. Litvinov of Russia, opened the meeting.

2. Adoption of Agenda

The Tentative Agenda was reviewed and adopted by the Panel (Appendix 1 to Annex 10). The Panel decided to review Agenda Items 5 through 7 separately for each species.

3. Election of Rapporteur

Dr. Z. Suzuki (Japan) served as Rapporteur for the Panel.

4. Review of panel membership

The Chairman confirmed the membership of the Panel as follows: Angola, Canada, France, Japan, Korea, Portugal, Spain, United States, Russia, and Venezuela. Angola was absent.

Ghana and Brazil were admitted as observers to the Panel.

BIGEYE TUNA (BET)

BET-5. Report of the Standing Committee on Research and Statistics (SCRS)

Dr. J. L. Cort, Chairman of the SCRS, summarized the status of the bigeye tuna stock, which was analyzed using the hypothesis of a single stock in the entire Atlantic. The only abundance indices used for the bigeye stock were those calculated from the catch rates of the longline fishery. Since the surface fisheries only catch bigeye seasonally or incidentally, their indices were not considered representative of the total stock abundance. The yield-per-recruit analysis indicated that with the current exploitation scheme, yield could increase significantly by increasing fishing mortality. The production model analysis indicated that the stock is exploited near the MSY level or is slightly over-fished.

BET-6. Measures for the Conservation of Stocks

The analyses indicated that under present conditions, the size regulation of 3.2 kg would not provide any possible gains in yield-per-recruit for bigeye tuna. Nevertheless, since the effort of the tropical surface fleet is increasing and the use of artificial floating objects increased the catch of juveniles to record amounts, the current regulation has been useful in improving the yield per recruit of the stock.

The U.S. Delegate noted that the SCRS Report indicated that recent fishing levels have been above MSY. He commented that in the near future some further regulatory actions may have to be taken and asked the SCRS to make intensive efforts to clarify the status of the stock.

The Delegate of Japan stated that as one of the major countries fishing for bigeye tuna in the Atlantic, his country recognized the necessity of better assessment of this stock, so that the rational utilization of this stock is achieved while proper conservation is ensured. More intensified studies are needed to reach a conclusion on the current stock status. This year's SCRS Report gave two very different views on the bigeye stock status. Namely, the result of the production model analysis suggested that the current catches are at the level of the MSY, and this analysis also indicated that fishing effort on bigeye is at a level around and above the optimal fishing effort for MSY. On the other hand, the yield-per-recruit analysis (based on virtual population analysis) clearly indicated a significant increase in yield if fishing mortality rates either by longline or by both longline and surface fisheries increase. Such inconsistency in the results of the analyses should be resolved as a matter of priority.

The Delegate of Japan stated that in-depth studies should be carried out on such aspects as the recent changes in the fishing method of longliners and the environmental conditions in the fishing grounds. Under these circumstances, Japan would like to avoid an increase in fishing effort on bigeye tuna and to provide maximum scientific information to the SCRS so that the Commission can have a solid scientific basis for the management of this stock in the future.

The Delegate of Ghana made the following statement:

"Ghana is attending this Panel as an observer. We have been hearing at this Panel year after year that the catch of juvenile bigeye tuna is increasing and that the size regulation that was introduced to halt the catch of juvenile tunas is not working. Ghana has repeatedly pointed out, based on several experiments at sea, that this regulation cannot be implemented due to the species composition in the tuna schools found in the fishing grounds, and the nature of the fishery. It took no less than three years for the purse seine fishing countries to accept the fact that the purse seiners are doing greater harm than the bait-boats on the juvenile fish. Yet, year after year, reports point accusing fingers at the Tema-based fisheries for violating the regulation, when in fact the small fish caught by purse seine are discarded at sea.

"It is a fact that the United States, who respects these regulations, has taken steps to sample the tuna that are imported from the Atlantic fisheries to determine the proportion of the small, undersized fish, and the results of the sampling have been published. No other country whose purse seiners fish in the Atlantic has ever, over the years, done this to assure the Commission of its commitment. In the skipjack catch table of the 1992 SCRS Report, it can be noted that the skipjack catch has increased from 11,200 MT in 1962 to 195,500 MT in 1991. This is a significant increase in catches, and should alert us all.

"This year another serious development has been brought to the attention of the Commission, i.e., the massive introduction of artificial floating objects for fishing. Records for 1991 have shown that, of the 75 percent increase in skipjack catches, the bulk of the fish are juvenile which are discarded at sea.

"Because of the instantaneous success of the use of artificial floating objects for fishing, vessels were able to return to port with full catches in short periods of between ten to fourteen days in 1991.

"Even at the beginning of 1992, these same vessels went out and for weeks, even months, and did not catch any tuna. How long this situation is going to continue no one knows. It must be pointed out here and now that scientists have side-stepped, through courtesy or diplomacy, the real issues involved with management measures to preserve the stocks, rather than hitting the nail on the head by taking serious steps to reduce the catching and discarding of large quantities of the juvenile tunas at sea.

"If this cannot be effectively done with the present models, then completely new and different models should be developed to assess the biomass of tropical tunas to truly reflect the picture, taking into account the quantities that have not been considered so far."

The U.S. Delegate expressed his support for the comments made by Ghana. He noted that they apply not only to bigeye tuna but to many other fisheries as well. The responsibility given to the Commission has to be met, as ICCAT's credibility has been challenged.

The Delegate of Spain pointed out that certain observations in the declarations made by the Delegate of Ghana do not seem to coincide with the assessments carried out by the SCRS.

BET-7. Research

Dr. Cort reiterated the recommendations of the SCRS regarding research on bigeye. He indicated that the SCRS had recommended improvements in both the collection of statistics and the analysis of data to increase the knowledge of stock. All these recommendations were endorsed by the Panel.

SMALL TUNAS (SMT)

SMT-5. Report of the Standing Committee on Research and Statistics (SCRS)

Dr. Cort noted that current available information generally does not allow an evaluation of the status of the stocks of most of these coastal pelagic species. However, in some areas, such as U.S. coastal waters, stock assessment through age-structured models for various species of *Scomberomorus* has been carried out. According to this study, some over-fishing has occurred. Studies by Brazil also indicated that their coastal stocks may have been over-fished.

The Delegate of Brazil stated that his country is very interested in this subject and may join the Panel

next year. He also pointed out that the spanish mackerel found in Brazil is serra spanish mackerel (*Scomberomorus brasiliensis*), which should not be confused with *S. maculatus* in the statistics and in stock assessments.

SMT-6. Measures for the Conservation of Stocks

The U.S. Delegate reported that since 1983, the U.S. Fishing Management Plan has been in effect. Under this Plan, king and spanish mackerels have been regulated by catch quotas.

SMT-7. Research

The SCRS Chairman outlined the Committee's recommendations on statistics and research. These recommendations were reiterated by the Panel.

BILLFISHES (BIL)

BIL-5. Report of the Standing Committee on Research and Statistics (SCRS)

Dr. Cort reported that information on the statistics, biology and stock assessment has been greatly improved as a result of the work accomplished at the Second ICCAT Billfish Workshop held in July, 1992.

As was suggested in previous studies, the new stock assessment indicated that blue and white marlins are over-fished, although basic statistics, especially the catches, are still incomplete. It should be noted that the North Atlantic blue marlin stock is recovering. Sailfish stocks are being exploited moderately.

BIL-6. Measures for the Conservation of Stocks

The SCRS Chairman reported that recent stock assessments indicated over-exploitation of blue and white marlins. Consideration of the development of methods to reduce fishing mortality rates on these species is warranted at this time. Since most of the billfish catches are taken by offshore longline fleets, releasing live fish pulled along side longline vessels may be one approach to reduce the mortality rate. If the survival rate of marlin released from longline vessels is sufficiently high, then this approach may be one practical method to reduce mortality on these species.

Regarding the condition of stocks, the U.S. Delegate stated that his country had taken some domestic measures. He noted that international regulations are required and he recommended that the SCRS carry out more intensive studies on these stocks and on the possible need for regulations.

The Delegate of Japan noted that his country has actively participated in billfish research in the Atlantic for many years. He stated that Japan was the major contributor to billfish research by providing long-term statistics. He also referred to the SCRS Report on billfishes and shared the concern expressed by other delegations. Since the SCRS Report shows that the by-catch by longline fisheries constitutes a major part of the catch, Japan offered to cooperate in efforts to reduce the fishing mortality rate by initiating any possible experiments as suggested in the SCRS Report.

The Delegate of Japan also noted that, at the same time, a reduction in billfish mortality by other fisheries targeting billfish, including the recreational fisheries, should also be considered for the conservation of these species. He noted that the SCRS Report cited a number of countries that have recreational fisheries for billfishes. However, it was noted that billfish catch statistics are available to the Commission only for three of these countries. Japan is of the view that the basic statistics still need to be improved in order to have better knowledge on the status of stocks.

The Delegate of the U.S. made the following statement:

"The ICCAT Enhanced Billfish Research Program is a successful example of cooperation between the Commission and the private sector. Funded by recreational fishery organizations in the United States and Mexico, the Program has three objectives: (1) to provide more detailed catch and effort statistics; (2) initiate the ICCAT tagging program for billfish; and (3) collect data for age and growth studies.

"A highlight of the Enhanced Billfish Research Program was the Second ICCAT Billfish Workshop which was held in July, 1992, in Miami, Florida, U.S.A. Many scientists from many Atlantic countries contributed to the success of the Workshop.

"The results of the Workshop's assessments on blue and white marlins demonstrated that their biomass is below the MSY level and that the fishing mortality of white marlin is of particular concern.

"The SCRS Report for this year recommends that consideration be given at this time to the development of methods for the reduction of fishing mortality on billfish. We request that the SCRS prepare advice on this issue for the 1993 Commission meeting.

"The SCRS is particularly concerned about the depressed state of white marlin biomass and the high levels of fishing mortality, which has been continuing for about two decades.

"Since large numbers of billfish brought alongside longline vessels appear to be alive, releasing these may be one mortality rate reduction approach that could reduce the current high rates of fishing mortality without affecting landings of the target species.

"The number of trips with observers on board for the Enhanced Billfish Research Program needs to be expanded. Increased longlining activities in the Caribbean and Gulf of Mexico potentially increase the by-catch of billfish. Current U.S. law requires that all billfish be released alive or dead, and the U.S.A. recommends that all ICCAT nations release live billfish. Further, we would encourage all ICCAT nations to participate in the ICCAT billfish tagging program by tagging all billfish that are released live. The Billfish Foundation, a U.S.-based billfish conservation organization, will, in the very near future, announce a billfish tag lottery that will provide a monetary incentive to tag and to return tags, and it is hoped that such an effort will increase the number of recoveries reported. Also, we suggest that ICCAT countries initiate management measures to direct fishing pressure away from billfish concentrations and tag and release live billfish.

"We thank the SCRS for its fine work, and we understand that the white marlin and blue marlin fisheries may not be important to all countries, but the decline has had a severe impact on U.S. fisheries. We hope that the Commission and the SCRS will continue to focus their efforts in studying these stocks. We ask that the Enhanced Billfish Research Program continue."

The Delegate of Spain stated that it was a problem of by-catches. He noted that Spain had begun observer cruises two years ago and pays close attention to this matter.

The Delegate of Japan noted that U.S. domestic law requires the release of all billfishes, whether alive or dead. Japan recognized that such a law is then only applicable to the U.S. The Delegate of Japan expressed his country's view that all living marine resources, including billfishes, should be utilized for human consumption.

The Delegate of Japan further referred to the U.S. statement that white marlin and blue marlin fisheries perhaps were not important to all countries. The Delegate of Japan pointed out that in the course of normal longline operations, the by-catch of these species is unavoidable, and in this sense, these species are also important to other countries as well as to the U.S. The Delegate of Japan expressed the need to find a solution for this problem.

BIL-7. Research

The SCRS Chairman outlined the Committee's recommendations on statistics and research. All these recommendations were reiterated by the Panel.

OTHER SPECIES - SWORDFISH (SWO)

SWO-5. Report of the Standing Committee on Research and Statistics (SCRS)

The SCRS Chairman informed the Panel that there was considerable improvement in data as a result of the various inter-sessional meetings held by ICCAT in 1992. For the Mediterranean, major improvements in statistics were made. However, there are still many problems of non-reporting or under-reporting of catches and a lack of adequate standardized abundance indices and size data. Therefore, for the Mediterranean stock, the catch-at-size data base was created but no in-depth stock assessment was possible. The north stock hypothesis was given priority in the analysis.

Dr. Cort noted that a non-equilibrium production model was applied to North Atlantic swordfish. The base case estimate of MSY adjusted for bias was 14,200 MT. A number of sensitivity analyses showed MSY estimates from 14,300 MT to 15,200 MT and estimates of the ratio B_{92}: B_{MSY} were from 84 to 95 percent (where B_{92} is the biomass at the beginning of 1992) and optimum effort f_{MSY} was 71.6 million hooks/year. From the CPUE index, the 1991 effort was estimated at 69.9 million hooks/year, but the model suggests the effective effort may have been higher.

Dr. Cort reiterated the results of the VPA which indicated that:

1) Stock size of age 1 swordfish (recruits) increase gradually from 1978 through 1987, remained at the same level in 1988, and increased in 1989 and declined in 1990. Stock size of the ages 2-4 juvenile group increased throughout the period 1978-87 and has been variable since then. The age 2-4 stock size at the beginning of 1992 increased substantially due to the calculated increase in the 1990 year class. Adult stock size (ages 5+) declined continuously throughout the time series to approximately half of what it was in 1978. There was a small increase in the estimated abundance of age 5+ in 1992.

2) The fishing mortality rate of age 1 and the ages 2-4 group fluctuated, but with a generally increasing trend through 1988, with a constant decline in 1989-1991. F on ages 5+ appears to have increased significantly during 1978-87 with a gradual decline from 1988 to 1991.

Three yield-per-recruit analyses indicate current F to have been larger than common reference fishery mortality rates ($F_{0.1}$, F_{max}). However, the 1991 vector appears to be near F_{max}.

The U.S. Delegate commended the SCRS for the extraordinary progress made in its stock assessment work and noted that the stock conditions are better than what was thought a few years ago. However, he expressed the opinion that the results of various assessment models do not quite match and the hope for further improvements in assessments in the coming years.

The Delegate of Spain also commended the SCRS for positive improvements made through the efforts of many countries in joint research work. He drew the attention of the Commission to the fact that while data improvements have been made, some data are still lacking and he insisted on timely data submission and continuous data improvement.

The SCRS Chairman noted that sometimes the contradictory results depend on the methods that were used, such as some differences found between the results of production models and VPA. Part of these contradicting results could be derived from technical aspects and also could be due to the different hypotheses used. This will be taken into consideration in future studies.

SWO-6. Measures for the Conservation of Stocks

The SCRS Report indicated that prior to the ICCAT recommendations on swordfish in 1990, several national regulations were adopted by different countries, mostly for the regulation of gear and licensing control. Canada limited entry into the swordfish fishery in 1984, has strict vessel size replacement regulations and does not permit gillnetting of swordfish. Driftnets targeting swordfish have also been banned by Spain (1990). The ICCAT recommendations for swordfish (agreed upon at the 1990 Commission meeting) entered into effect in July, 1991.

The SCRS Chairman reported that as regards the ICCAT recommendation to reduce fishing mortality (or the equivalent amount of fishing effort), in the North Atlantic, estimated F has decreased by 15 to 42 percent relative to 1988. The catch has decreased accordingly from 19,137 MT in 1988 to 13,212 MT in 1991, a decrease of 31 percent.

The percentage of undersized fish (lower jaw/fork length less than 125 cm) for the major countries of the North Atlantic has declined in general in 1991. This may reflect the effect of regulations or the change in the geographical distribution of fishing effort and stock dynamics.

The SCRS Chairman further reported that enhanced monitoring can improve the understanding of the effect of the current management program. At this time, the SCRS could not reach a consensus on any additional recommendations for management of the North Atlantic swordfish resource.

Dr. Cort noted that the Committee is seriously concerned about the status of the total Atlantic stock, especially because of the rapid increase in the catch from the south Atlantic in recent years. The present south Atlantic catch is about the same as the North Atlantic catch. There has also been decline in adult fish CPUE from the south Atlantic zone as noted in the 1991 SCRS Report. Therefore, the Committee recommended that the fisheries in the south Atlantic be monitored closely. The Committee expressed concern about the magnitude of the catches in the Mediterranean area, particularly small fish. Due to the lack of adequate data for a quantitative stock assessment, no management recommendations could be made at this time.

The Delegate of the U.S. stated that a future reduction of current effort by 10 percent may be necessary to rebuild the stock to the optimum level and any increase in catches by any nations could undermine the reduction in effort achieved by the major fishing nations (i.e., Spain and the U.S.). He also suggested a significant reduction in fishing effort in the south Atlantic. The Delegate of the U.S. further proposed

consideration of a by-catch limit of 5 percent and establishment of a quota for minor fishing nations. The U.S. statement is attached as Appendix 2 to Annex 10.

The Delegate of Spain expressed his agreement with the U.S. in that the improvement in the stock has been accomplished through sacrifices by fishermen. Much of the improvement was a result of the 31 percent and 42 percent reduction in effort by the U.S. and by Spain, respectively, in the North Atlantic. He noted that the burden should be shared by all the countries, and not only by these two major fishing nations. The fishing mortality on this species in the North Atlantic was reduced to a satisfactory level and should have a positive effect. Although some uncertainties remain on the abundance indices of 5+ fish, the stock has broken its declining trend and has begun to show signs of recovery. The Delegate of Spain also expressed concern about the incidental catches of swordfish and the stock recovery plans.

The Delegate of Japan stated that in the Japanese fisheries, swordfish are caught in the course of longline operations for bigeye tuna. He pointed out that the Japanese longline fishery is the only fishery that covers a wide range of the Atlantic Ocean, even including high latitude waters of the south Atlantic. The catch is distributed over this wide range. He indicated that Japan would like to examine the possibility of contributing further to the understanding of scientific knowledge on swordfish, particularly stock identification and life history.

The Delegate of Japan also stated that as the SCRS Report on swordfish shows the Japanese swordfish catch in the North Atlantic decreased in 1991 by 40 percent from the recent peak year of 1989, and the current by-catch level is 5.5 percent, which is well below the ICCAT limit of incidental catch rate, i.e., 10 percent. In the south Atlantic, the Japanese catch decreased by 45 percent from the peak year of 1990 and returned to the level of 1988. In the total Atlantic, the Japanese catch in 1991 decreased by 40 percent form the peak year of 1990. The Delegate of Japan noted that his country intended to continue to monitor carefully the swordfish catch taken by its fisheries and to take appropriate action, if necessary, in the future.

The Delegate of Canada stated that until 1970, Canada was the leading fishing nation in the North Atlantic swordfish fishery. Since 1984, however, effort has been restricted and hence catch has been reduced while still being maintained as an important fishery for Canada. During this latter period, other countries have developed fisheries and increased the catch of swordfish in the North Atlantic.

The Delegate of Canada further recalled that, at the 1990 meeting, the Commission and Panel held lengthy discussions on the SCRS Report and finally came up with a number of recommended regulatory measures that the Commission hoped would address these SCRS concerns. He noted that Canada had implemented a number of regulations to enforce the ICCAT swordfish management measures, and, in fact, imposed additional measures on Canadian fishermen, and this information has recently been transmitted to the Commission. He also noted that the 1992 SCRS Report indicated some improvement over the 1990 picture. The imposition of minimum size and the resulting selectivity can be seen to "have resulted in potential gains in the long-term yield".

The Delegate of Canada commented that the fact that no consensus could be reached on any additional recommendations for management of the North Atlantic fishery would indicate that the Commission has been on the right track. He added that it is important, therefore, for Contracting Parties fishing this stock to adhere to those measures agreed to in 1990, with particular attention to the control of effort and enforcement of the adopted conservation measures.

The Delegate of Canada reiterated that Canada is concerned, as is the SCRS, about the status of the total Atlantic stock. He noted that his country is particularly concerned about the delineation of the stock and whether it may, in fact, be one Atlantic stock. With these uncertainties, Canada believes that there is a good possibility that management measures put in place in the North Atlantic may be negated by the increase in effort in the South Atlantic. Canada therefore believed that attention should be paid at this meeting to management measures for the south, and seek clarification of stock delineation.

The Delegate of Canada emphasized to the members of the Panel that the Canadian Advisory Committee on Swordfish has expressed serious concern over the lack of comparable enforcement and control of swordfish outside Canada. He added that it is essential that ICCAT ensure the comparability of conservation and management systems and the need for a "level playing field". He also expressed serious concern about the development of new fisheries utilizing different fishing methods and the apparent increased effort in some fisheries.

The Delegates of Spain and the U.S. jointly present-

ed a statement concerning possible additional management actions that the Commission might consider. The joint statement is attached as Appendix 3 to Annex 10.

The Delegate of Canada noted that when the Panel began its discussions on swordfish earlier in the week, Canada made a formal statement that ended by its expressing concern about the development of new fisheries utilizing different fishing methods.

The Delegate of Canada wished to expand somewhat on his earlier statement regarding this specific issue. He noted that the 1990 SCRS Report on swordfish had not been very optimistic and it was clear that without decreases in fishing mortality over the next few years, there would be a significant probability of detrimental effects on future stock yield. He noted that conclusions from the SCRS, along with others, had prompted the Commission at its 1990 meeting to put into place the first management measures ever for swordfish in the Atlantic Ocean.

The Delegate of Canada hoped, at that time, that such management measures would enable the Commission to improve the stock condition in a reasonable time. He noted that after ICCAT members had agreed to put restrictions on their operations, in the name of conservation, a new gear sector developed in the North Atlantic to fish large pelagics. He referred to pair trawling, a fishery that has a completely different selectivity pattern than any of the other sectors. He stressed that Canadian fishermen are extremely concerned about this new type of fishing gear being employed in the large pelagic fisheries, particularly as the number of vessels employing this method of fishing appears to be increasing at an unchecked rate. The Delegate of Canada emphasized that, given the uncertainty of the current resource status, Canada believes strongly that new gear types, such as this, should be limited to recent catch or effort levels for the immediate future, i.e., 1993-1994, until better data are available to assess their impact on the swordfish stock. He asked the United States delegation if the U.S. was as concerned as Canada is, and if so, if the U.S. could advise the Panel on whether or not the U.S. could agree to implementing some type of measure on this gear sector as outlined above.

The U.S. Delegate explained that his country has fully implemented its swordfish conservation program and has a quota in place based on the 1990 ICCAT recommendation. The U.S. ensured that its quota is maintained regardless of the gear types used. Under U.S. regulations, new gear types are not allowed into the directed swordfish fishery and are restricted to a two-swordfish-per-trip by-catch. The U.S. Delegation recognized and shared the concern about the potential introduction of new gear types in stressed fisheries and noted that the U.S. collects data, by observers, on the directed and by-catch aspects of its fisheries. He added that the U.S. will provide data on pair-trawl fisheries, as well as all other fisheries, to the SCRS and the Commission next year. The U.S. Delegate stated that his country is also studying management measures, such as capping effort and, perhaps, limiting entry. He indicated that, in addition, the U.S. may use controlled experimental fisheries to collect data on new gear types. He declared that the U.S. takes its responsibilities for conservation and wise management of pelagic resources very seriously.

The Panel recommended that the following actions be carried out:

1) That the Commission advise all nations involved in fisheries which harvest swordfish in the Atlantic Ocean to make every effort to maintain their catch levels or fishing capacity for the immediate future (1993-94) at recent levels;

2) That the SCRS be instructed to consider the impact of various management measures on Atlantic swordfish at the 1994 meeting that will enable the stock to rebuild over a reasonable period of time and be maintained at MSY levels; and

3) That the Commission request ICCAT Contracting Parties to place a high priority on domestic efforts to meet the research need identified by the SCRS in its research need agenda.

SWO-7. Research

The SCRS Chairman reviewed all the recommendations made by his Committee as concerns research and statistics.

The Delegate of the United States noted that the SCRS Report stated: "The new analysis for the North Atlantic stock indicates that the mortality estimates have declined below levels estimated for 1988. However, the impact of dead discards would mean that the fishing mortality rates for 1991 and 1992 would be in excess of those used in this document. Information on

the effectiveness of minimum size regulations is not available so the Committee cannot evaluate the realized benefits to the stock." (SWO species section).

The United States Delegate indicated that his country has imposed the minimum size regulation on its fleet. In order to assist in the determination of the effectiveness of the minimum size regulation, the United States also proposed to acquire additional stock data (e.g., number of discards, mortality, CPUE, etc.) under a specific research program that will allow for the controlled retention of dead, undersized fish in excess of the 15 percent tolerance that would otherwise have to be discarded. This controlled and limited program (20 to 25 participating vessels), under the supervision of authorized officials, will prohibit any sale of fish that are retained for these research purposes and will utilize strict tracking measures to ensure that these fish do not enter any commercial markets. He added that U.S. fishermen will be required to tag and release live, undersized swordfish and that this program is consistent with the current recommendations for swordfish. The U.S. Delegate stated that the effect of this program will be the same as the effect of the current recommendations; fishermen will be discouraged from taking small fish and encouraged to move away from areas where too many small fish are being caught incidentally. The United States will evaluate and report on this program within two years of implementation.

The Delegate of Spain noted that discards were almost nil for Spanish vessels, because the measure adopted had imposed evasion strategies to avoid areas and periods of concentrations of juvenile fish. The Delegate of Spain expressed concern about the implementation of this minimum size regulation and added that the proposed limited program for estimating discards is disturbing.

The Delegate of Spain considered that setting a minimum landing size of swordfish is an efficient management measure for the conservation of this stock. His country's experience in this type of regulation, besides directly protecting the juveniles, is an indirect measure to deter vessels from fishing in areas where there are concentrations of young fish.

The Delegate of Spain stated that the Spanish fleet has been able to reduce significantly its catches of juveniles, and now 19 percent of the total catch is comprised of fish below minimum size, as indicated by the results of its routine scientific observer programs on-board swordfish vessels. He noted that this declining trend continues and that discards are practically nil (less than 1 percent), according to preliminary data. In this sense, the Spanish Delegation eagerly awaits the results of the research program proposed by the United States to evaluate the fishing mortality on juveniles, in the hope that such results would be presented and analyzed within the framework of the SCRS as soon as they become available.

The U.S. Delegate noted that the Spanish experience of indirect measures concerning minimum size is interesting. While recognizing that implementation of a minimum size regulation would help improve the state of the stock, he noted that U.S. fishermen have been encouraged to move to areas where juvenile swordfish are scarce but this is not always easy. The proposed pilot research program would not provide any gain for fishermen. Observer programs are difficult to carry out with small boats. Many cooperative fishermen have voluntarily introduced minimum size regulations even before they were officially in effect. Those are the people involved in this pilot program.

8. Date and place of the next Panel meeting

The Panel decided to hold its next meeting at the same time and place as the 1993 Commission Meeting.

9. Other Matters

No other matters were discussed.

10. Adoption of Report

The Report of Panel 4 was adopted.

11. Adjournment

The meeting of Panel 4 was adjourned.

Appendix 1 to Annex 10

Agenda of Panels 1 - 4

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. Report of the Standing Committee on Research and Statistics (SCRS)
6. Measures for the conservation of stocks:

Panel 1

a) Yellowfin
b) Skipjack

Panel 2

a) Bluefin (North)
b) Albacore (North)

Panel 3

a) Southern bluefin
b) Albacore (South)

Panel 4

a) Bigeye
b) Atlantic bonito
c) Billfishes
d) Other species

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

Appendix 2 to Annex 10

Statement by the United States on Swordfish
(Attached to Report of Panel 4)

1. The United States is encouraged by the results from the recent swordfish stock assessment, which apparently indicate that significant reductions in fishing mortality in excess of the ICCAT recommendations have been achieved largely by the United States and Spain. The effectiveness of the current management regime must continue to be carefully monitored. The preliminary results indicate that current harvests may be sustainable in the short-term. However, given the uncertainty in the analyses and the fact that stock rebuilding is unlikely at current effort levels, future reduction of about 10 percent may be necessary to increase the probability of rebuilding and stabilizing the stock at the optimum level. Stabilizing current harvests is critical at this point for the entire fishery, especially for the minor fishing nations and the by-catch fisheries which account for about 25 percent of the current harvest. Increases in catches by any nation could undermine the reductions in fishing mortality which have been accomplished primarily by Spain and the United States.

2. It is noted that there has been a concentration of fishing effort between the Equator and 5°N, and an increase in effort in the South Atlantic. To address this currently unrestricted component of the harvest, and in an effort to sustain the Atlantic stock, ICCAT

should cap the effort in the South Atlantic and seek a significant reduction in the fishing effort the area between 5°N and the Equator.

3. For those nations conducting by-catch fisheries, ICCAT should consider setting a quota of 5 percent (based upon weight), of their landings averaged over the last three years. This estimate appears reasonable as determined from the SCRS Report. These by-catch fisheries could stay within that catch limit by tagging and releasing live fish. This would minimize impacts on their directed fisheries.

4. For those other minor fishing nations with directed swordfish fisheries that have not established a quota, they should establish a quota that is based upon the highest figure resulting from (a) their 1991 landings, or (b) an average of their 1988-91 landings, or (c) the average of their 1989-91 landings.

5. With these considerations for the Atlantic swordfish stock in mind, and based upon the SCRS Report, the Commission should:

Direct SCRS to present a recovery plan for Atlantic swordfish at the 1994 meeting that will enable the stock to recover to, and by maintained at, MSY levels (B_{MSY}, F_{MSY}) within a range of specified time frames (e.g., 3 and 5 years).

To accomplish this objective, the SCRS should:

a) Define reductions in fishing mortality needed to achieve F_{MSY} in the specified time frames.

b) Present catch and mortality rate options to accomplish the above objectives with a high probability of success.

6. ICCAT should also request submission of documentation of the methodology and calculations that have guided ICCAT nations in implementing the 1990 ICCAT swordfish recommendations, in advance of the next SCRS meeting, so that country scientists can have time to study them.

7. Request that ICCAT nations place a high priority in their domestic research efforts to meet the research needs identified by the SCRS in its research agenda.

Appendix 3 to Annex 10

Statement by United States and Spain on Swordfish
(Attached to Report of Panel 4)

North Atlantic swordfish management under the current ICCAT recommendations rests largely on reductions in fishing mortality by the United States and Spain. However, under the current program, 25 percent of total catch is not limited and some minor harvesting nations have reported increased landings after 1988.

Spain and the United States would like to recommend that the SCRS consider and provide advice so that the Commission may be prepared to make additional management recommendations that would ensure equitable sharing of future management responsibilities by all harvesting nations in 1993.

Spain and the United States recommend that the following options should be considered by the SCRS and the Commission:

1) Minor fishing nations should establish quotas that limit their catches to the level of recent years.

2) By-catch fishing nations should establish an upper limit quota based on the recent years proportions of swordfish in weight to the target species weight. By-catch fishing nations should attempt to keep mortality below the quota limit by tagging and releasing live swordfish.

3) ICCAT should also request submission of documentation of the methodology and calculations that have guided ICCAT nations in implementing the 1990 ICCAT swordfish recommendations, in advance of the next SCRS meeting, so that country scientists can have time to study them.

4) Request that ICCAT nations place high priority in the domestic research efforts to meet the research needs identified by the SCRS in its research agenda.

ANNEX 11

RECOMMENDATIONS FOR THE 1992-1993 MANAGEMENT OF WESTERN ATLANTIC BLUEFIN TUNA

The Commission recommends:

First:

In order to achieve the goals of maintaining improvements in the western Atlantic bluefin tuna stock and allowing ICCAT to develop an enhanced multi-year recovery program for this stock:

a) the Contracting Parties whose nationals have been actively fishing for bluefin tuna in the western Atlantic institute, for the interim, effective measures to limit the quota for scientific monitoring purposes as follows:

Period	*Quota for period*	*Max in first year*
1992 and 1993	4,788	2,660 MT
1994 and 1995	3,990	2,261 MT

b) the biannual scientific monitoring quotas described in Paragraph 1(a) be taken by these Contracting Parties in the same proportions as previously agreed for in 1990;

Notwithstanding Paragraph (a) the catch limits in 1994 or, if not in 1994, in 1996 will return to those in 1991 unless the SCRS analysis in 1993 or 1995 indicates otherwise.

c) a special western Atlantic bluefin management review committee consisting of representatives of these Contracting Parties be established for the purpose of discussing approaches for implementing the measures and reviewing the status of western Atlantic bluefin catch. This management review committee will meet early in 1992 to consider a possible reduction of the fishing level to 50 percent of the 1991 scientific quota to allow for a more rapid rebuilding of the western Atlantic bluefin stock in accordance with the following proposed schedule:

The catch limits for the western Atlantic bluefin tuna for the years 1993 and 1994 are as follows:

	US	*Canada*	*Japan*	*Total*
		(MT)		
1993	693 MT	286 MT	350 MT	1,329 MT
1994	693 MT	286 MT	350 MT	1,329 MT

The catch limits in 1995 will return to those in 1991 unless the SCRS analysis in 1994 indicates otherwise.

d) Beginning with the 1992 catch, if the catch of one of these Contracting Parties exceeds its annual or biannual scientific monitoring quota, then in the biannual period or year following reporting of that catch to ICCAT, that Contracting Party will reduce its catch to compensate in total for that overage. Such a reduction will be applied to the domestic catch category of the applicable Contracting Party of the overage.

Second:

The three Contracting Parties will prohibit the taking and landing of bluefin tuna weighing less than 30 kg. or in the alternative having a fork length less than 115 cm.

Notwithstanding the above regulatory measure, these three Contracting Parties may grant tolerances to capture bluefin tuna either weighing less than 30 kg.. or in the alternative having a fork length less than 115 cm. to limit the take of these fish to no more than 8% by weight of the total bluefin catch on a national basis and would institute measures such that there would not be any economic gain to the fishermen from such fish.

Third:

These three Contracting Parties will encourage their commercial and recreational fishermen to tag and release all fish less than 30 kg or in the alternative having a fork length less than 115 cm.

Fourth:

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

Fifth:

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

Sixth:

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

Seventh:

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

Eighth:

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

ANNEX 12

REPORT OF THE MEETING OF THE INFRACTIONS COMMITTEE

1. Opening of the Meeting

The meeting was opened by the Chairman of the Committee, Mr. A. J. Penney of South Africa, who presented an introductory statement on the role of the Infractions Committee within ICCAT. (The complete text of the Chairman's statement is attached as Appendix 2 to Annex 12). The Chairman complemented the excellent work of the SCRS, but noted the success of ICCAT is judged by how the scientific work of the SCRS is translated into effective management recommendations, how these are implemented by member and non-member countries and how successfully they are applied in Atlantic tuna fisheries. He commented further that inadequate self-appraisal by ICCAT and the Infractions Committee has contributed to the fact that outside organizations, who are less acquainted with ICCAT's work, have begun to scrutinize ICCAT closely. The Chairman asked all delegates to bear in mind the original objectives of the Committee and to suggest potential improvements during discussion of the future work of the Committee.

2. Adoption of Agenda

The Agenda was adopted without change, and is attached as Appendix 1 to Annex 12.

3. Election of Rapporteur

The Chairman asked whether the U.S.A. would be willing to provide a rapporteur for the meeting and Mr. J. McCallum (U.S.A.) offered to serve as rapporteur.

4. Status of the Application of the Regulations Recommended by the Commission on Yellowfin, Bigeye, Bluefin, and Swordfish

The Executive Secretary presented document COM/92/20, which contained the text of the ICCAT regulations currently in effect and tables on the status of their application by member countries (See Tables 1, 2, 3 and 4 attached to this Report). Regarding bluefin, the Executive Secretary noted that the 15% allowance of undersize fish has been markedly exceeded and that age 0 fish are being taken in large numbers. He urged that all countries devote every effort to complying with these regulations.

The Executive Secretary noted that COM/92/20 contained the new management measures for western Atlantic bluefin tuna adopted at the Twelfth Regular Meeting in 1991, a reference to the first meeting of the Management Review Committee held in Tokyo on May 22 and 25, 1992, and regulatory measures for Atlantic Swordfish adopted at the Seventh Special Meeting in 1990. Three supplements received after compilation of the document were also presented: A summary of Canadian regulations implemented to enforce ICCAT swordfish management measures; A report on South African implementation of the ICCAT swordfish measures; and a U.S.A. report on implementation of the 1990 ICCAT swordfish recommendations. The Executive Secretary referred to the table on the current status of regulatory measures and asked for any modifications or corrections. He also asked that any Non-Contracting Parties with an interest give attention to and collaborate with ICCAT on these regulatory measures.

The Delegate of Korea commented that on July 31, 1991, Korea issued a decree establishing a 25 kg minimum size limit for swordfish and a 15 percent undersized fish catch tolerance per trip. Formal notification will be provided to the Secretariat in the

near future. The Delegate of Spain noted that Table 4 should show February 25, 1991 as the date of Spanish implementation of all of the ICCAT recommendations for swordfish. The Delegate of Japan noted that Japan had already taken all measures to implement all ICCAT recommendations on all species. However, the information was provided orally and was not yet reflected in the tables. The Delegate indicated that Japan would provide the information to the Secretariat in written form.

The Delegate of Brazil indicated that, up to 1991, their fishery did not catch any swordfish smaller than 25 kg. However, he added that analysis of the updated size data was being conducted and that the minimum size measure would be implemented if it was found that undersized fish were being caught. The Delegate of the United States reported that the United States had fully implemented ICCAT recommendations for swordfish and the western Atlantic stock of bluefin tuna. The Delegate of Canada noted that Canada had submitted information in Supplement 1 that was not yet included in the tables.

The Chairman thanked the Delegates for providing information, and asked all countries to inform the Secretariat of any updates, modifications, or corrections in a timely manner.

5. Collaboration of Non-Contracting Parties in the Objectives of the Commission

The Chairman remarked that this agenda item had been specifically included on the Plenary Agenda as Item 10, and was reported in document COM/92/22. He therefore proposed that it be deferred to the Plenary session. There was no objection to this suggestion, and the discussion was deferred to the Commission Plenary Session.

The Delegate of Japan presented documents concerning tuna import statistics and photographs of re-flagged tuna vessels operating in the Mediterranean Sea and sighted at some ports, and noted that such data could provide vital information on the activities of non-member countries. The Delegate of Japan suggested that efforts should be made by other Contracting Parties to collect such information, and to present this to the Infractions Committee for consideration. The Chairman thanked the Delegate of Japan for these contributions and noted that such information could form a vital part of the management implementation reports to be discussed under Agenda item 7. He noted that the Japanese reports would be specifically discussed under Plenary Item 10.

The Chairman proposed that the Committee transmit its concern about the increasing problem of non-collaboration by non-Contracting Parties with ICCAT management measures, noting that this problem appeared to have become more severe than infractions by Contracting Parties. The Committee approved this proposal.

6. Review of Port Inspection

The Executive Secretary presented document COM/92/21, which provided background information on implementation of the Port Inspection Scheme, and improved forms to be used for inspection, as well as a list of inspectors and correspondents named by each country. He noted that the Scheme had been accepted formally by nine nations, and that Angola and Uruguay had indicated their intention to participate in the Scheme by designating inspectors. Since the last meeting of the Infractions Committee in 1991, only one inspection report was submitted to the Secretariat, by South Africa, which reported that no transgressions of ICCAT management measures were observed.

The Chairman noted little change in the number of countries that have indicated acceptance of the Scheme, and commented on the limitation of the effectiveness of the Scheme as a consequence of incomplete acceptance. He asked whether the Scheme is serving a role, or whether its role had been taken over by scientific sampling of undersized fish. The Delegate of Spain considered the Scheme important, and felt it should be adopted in its entirety by all countries. In 1991, Spain conducted inspections of its surface longliners for swordfish and tuna vessels at the two most important landing ports and found no infractions. These inspection results will be sent to the Secretariat.

The Delegate of Japan indicated that his country had fundamental legal difficulties with accepting the Scheme, as well as serious concerns about the degradation of the quality of deep-frozen fish destined for the "sashimi" market. Nonetheless, Japanese fishermen had been instructed to cooperate with the Scheme. The Delegate of Japan called the attention of the Committee members to paragraph 3 of the Scheme which calls for avoidance of undue interference with fishing activities. He noted that all catches are

eventually unloaded in Japan, and that random inspections are conducted at Japanese ports. The Delegate of Japan noted that Japan has also sent patrol boats to the Mediterranean and western Atlantic, and has conducted briefing meetings for Japanese skippers at Canadian ports. The Delegate also reported that Japan is now using satellite location devices on an experimental basis, and hoped to introduce such devices for its entire fleet. He expressed the hope that other countries would adopt a similar system for monitoring fishing activities.

The Chairman expressed appreciation for the Delegates' reports and suggested that this type of information be provided on an annual basis for the Infractions Committee to compile and summarize for Commission use. He proposed that this possibility be further explored under Agenda Item 7.

7. Future Work of the Committee and Plans for Improvement

The Chairman remarked that there is substantial scope for improvement of implementation and compliance within the Commission, and that substantial effort is required to gain the involvement of non-Contracting Parties.

The Delegate of the U.S.A. presented a statement expressing similar sentiments, the text of which is attached as Appendix 3 to Annex 12. The Delegate noted that there appeared to be disregard for some of the Commission recommendations, and that this reduces the credibility and effectiveness of ICCAT. The Delegate expressed specific concerns about the large catch of small bluefin tuna in the eastern Atlantic, the greatly increased fishing mortality on 2-4 year-old fish and the considerably smaller size of spawning stocks compared to 1975. He suggested that the Infractions Committee be presented with annual reports by the Contracting Parties explaining the statistical data collection and monitoring systems of each member country and showing details of implementation of ICCAT management measures (see Appendix 3 to Annex 12). The Delegate of the United States concluded that improved enforcement of regulations and detailed reporting on compliance with ICCAT management recommendations is essential to the functioning of this Commission.

The Chairman noted that the remarks of the Delegate of the United States mirrored many of the sentiments expressed in the Chairman's opening address. He asked delegates for comment on whether an annual report to the Infractions Committee on the degree of contravention of ICCAT management recommendations would be useful. The Executive Secretary confirmed that it would be feasible to compile such a report in cooperation with the Chairman of the SCRS. The Chairman also requested comments on the value of requesting the Contracting Parties to submit broad national reports containing information on statistical data collection systems, implementation of ICCAT management measures and inspection and monitoring activities. Such reports would provide the Committee with vital background information which could be combined with the Secretariat report on contraventions to highlight specific problems. The suggestion was specifically supported by the U.S.A., Japan, Canada, Spain, Venezuela, Sao Tomé & Príncipe, Korea and South Africa, and there were no objections from other countries. The proposal was considered to be unanimously supported.

The Chairman noted that the details of annual report requirements could not be worked out in the short time available to the Infractions Committee, and that member countries would need time to consider various possibilities. He agreed to work with the Executive Secretary to prepare proposed guidelines for national management implementation reports to be circulated to member countries for perusal and comment. He suggested that a new item be added to the agenda of the Infractions Committee meeting, under which these reports would be considered.

In his concluding comments on this item, the Chairman noted that the Port Inspection Scheme had been relatively ineffective in recent years, and that it might be better replaced by a more general reporting system, such as that considered above. Japan noted that much time would be needed to give adequate consideration to the various inspection and reporting options and suggested that this issue be discussed at the next meeting of the Infractions Committee. The Committee agreed and further discussion of this issue was deferred until the next Infractions Committee meeting.

8. Date and Place of the next Meeting of the Infractions Committee

The Chairman proposed that the next meeting of the Infractions Committee be held to coincide with the

Thirteenth Regular Meeting of the Commission. This proposal was accepted by the Committee.

9. Other Matters

No other matters were discussed.

10. Adoption of Report

The Report of the Infractions Committee was adopted.

11. Adjournment

The meeting of the Infractions Committee was adjourned.

Status of implementation by the member countries of the ICCAT recommendations.

Table 1. YELLOWFIN and BIGEYE TUNAS.

Species	*YELLOWFIN*	*BIGEYE*	
Commission recommendation	*3.2 kgs minimum size limit*	*3.2 kgs minimum size limit*	*3.2 kgs minimum size limit*
Area of application	*Entire Atlantic*	*Entire Atlantic*	*Entire Atlantic*
Date of entry into effect	*July 1, 1973*	*September 7, 1980*	*July 17, 1985*
Date of expiration	*Indefinite period*	*December 31, 1984*	*Indefinite period*
ANGOLA	June 17, 1979		
BENIN			
BRAZIL	Feb. 23, 1973	March 1981	
CANADA	Sept. 4, 1973	No fishing	
CAPE VERDE	Sept. 5, 1987		Sept. 5, 1987
COTE D'IVOIRE	March 2, 1970	March 2, 1970	
EQUATORIAL GUINEA	.....	No fishing.....	.....
FRANCE	June 29, 1973	March 3, 1981	
GABON	No fish./land.	Being considered	
GHANA	June 19, 1976		
GUINEA, Rep. of			
JAPAN	June 14, 1973	Sept. 7, 1980	Sept. 7, 1980
KOREA, Rep. of	Jan. 21, 1973	Sept. 15, 1980	
MOROCCO	No fishing		
PORTUGAL	Nov. 26, 1973	July 17, 1981	Aug. 10, 1984
RUSSIA	Sept. 28, 1978	Sept. 28, 1978	
SAO TOME & PRINCIPE			
SOUTH AFRICA	May 1973	Dec. 5, 1980	Dec. 5, 1980
SPAIN	May 29, 1974		Aug. 14, 1987
URUGUAY			
USA	Nov. 5, 1975	March 30, 1981	April 9, 1986
VENEZUELA	Nov. 19, 1981	Nov. 19, 1981	Nov. 19, 1981

NOTE: For more details on national regulations, please request information from the country's administration.

Status of implementation by the member countries of the ICCAT recommendations.

Table 2. BLUEFIN TUNA - ATLANTIC OCEAN (including MEDITERRANEAN SEA).

Recommendation	*Minimum size 6.4 kgs*	*Limiting fishing mortality to recent levels*				
			1st Extension	*2nd Extension*	*3rd Extension*	*4th Extension*
Area of application	*Entire Atl.*	*Entire Atl.*	*Entire Atl.*	*Entire Atl.*	*Entire Atl.*	*East Atl. only*
Entry into effect	*Aug. 10, 1975*	*Aug. 10, 1975*	*Aug. 10, 1976*	*Oct. 10, 1978*	*Sept. 4, 1980*	*July 21, 1982*
Date of expiration	*Indefinite*	*Aug. 10, 1976*	*Aug. 10, 1978*	*Aug. 10, 1980*	*Aug. 10, 1982*	*Indefinite*
ANGOLA	No fishing	.....		No fishing		
BENIN						
BRAZIL		Aug. 10, 1977	Aug. 18, 1977	March 2, 1979	Nov. 17, 1980*	
CANADA	Feb. 17, 1973	Feb. 17, 1976	Feb. 15, 1979	Feb. 15, 1979	Feb. 15, 1979	Feb. 15, 1979
CAPE VERDE						
COTE D'IVOIRE						
EQUATORIAL GUINEA						
FRANCE	Aug. 8, 1975	Dec. 27, 1974	Dec. 27, 1974	Dec. 27, 1974	Dec. 27, 1974	
GABON	No fish./land.	.....		No fishing		
GHANA						
GUINEA, Rep. of						
JAPAN	April 16, 1975	April 16, 1975	April 16, 1975	April 16, 1975	April 16, 1975	March 3, 1982
KOREA, Rep. of	Dec. 17, 1975	Dec. 17, 1975	Dec. 17, 1975	Oct. 14, 1978	Sept. 15, 1980	
MOROCCO						
PORTUGAL	Nov. 27, 1976	Nov. 27, 1976	**	**	**	
RUSSIA	Sept. 28, 1978					
SAO TOME & PRINCIPE						
SOUTH AFRICA	June 27, 1975	June 27, 1975	Oct. 19, 1976	Feb. 9, 1979	Jan. 11, 1980	
SPAIN	March 3, 1975	Feb. 19, 1976	Feb. 19, 1976	Feb. 19, 1976	Jan. 24, 1980	
URUGUAY						
USA	Aug. 13, 1975	Aug. 13, 1975	May 18, 1976	June 15, 1979	June 13, 1980	
VENEZUELA	Nov. 19, 1981					

* In process.
** Objections presented and ratified on November 16, 1978, March 19, 1980, and July 21, 1982.
NOTE: For more details on national regulations, please request information from the country's administration.

Status of implementation by the member countries of the ICCAT recommendations.

Table 3. BLUEFIN TUNA - WEST ATLANTIC.*

Catch prohibited except for monitoring purposes	*1,160 MT*	*2,660 MT*	*2,660 MT*	*2,660 MT*	*2,660 MT*	*2,660 MT*
Minimum size limit	*no*	*120 cm*	*120 cm*	*120 cm*	*120 cm*	*115 cm /30 kg*
Catch prohibited Gulf of Mexico spawning stock	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*
Date entry into effect	*Feb. 15, 1982*	*January 1983*	*January 1984*	*January 1985*	*January 1986***	*January 1992****
Date of expiration	*January 1983*	*January 1984*	*January 1985*	*January 1986*	*January 1992*	*January 1993*
ANGOLA	.....	No fishing	.....			
BENIN						
BRAZIL	.....	Developing fishery not subject to limitation	.....			
CANADA	June 14, 1982	June 21, 1983	June 21, 1983	Sept. 16, 1985	Sept. 16, 1985	
CAPE VERDE						
COTE D'IVOIRE						
EQUATORIAL GUINEA						
FRANCE						
GABON	.....	No fishing or landings	.....			
GHANA						
GUINEA, Rep. of						
JAPAN	March 3, 1982	March 7 1983	March 7, 1983	March 7, 1983	March 7, 1983	
KOREA, Rep. of						
MOROCCO						
PORTUGAL	.....	No fishing	.....			
RUSSIA			Feb. 15, 1984	Feb. 15, 1984		
SAO TOME & PRINCIPE						
SOUTH AFRICA	.....	No fishing or landings	.....			
SPAIN						
URUGUAY						
USA	June 11, 1982	June 17, 1983	July 24, 1984	Nov. 25, 1985	Nov. 25, 1985	
VENEZUELA						

* Details on the ICCAT recommendations are given in each Biennial Report of the Commission, starting with the "Report for Biennial Period 1982-83, Part I".
** This recommendation has been extended each year since 1986. It was in force until the end of 1991.
*** Enhanced management measures adopted in 1991.
NOTE: For more details on national regulations, please request information from the country's administration.

Status of implementation by the member countries of the ICCAT recommendations.

Table 4. SWORDFISH.

Commission recommendations	*Fishing mortality of fish > 25 kgs to be 15 % less than recent levels*	*25 kgs minimum size limit (125 cm fork length)*	*Limiting directed fishing mortality to 1988 levels*	*Limiting incid. catch of SWO to 10 % of total catch in weight of targeted species*
Area of application	*North of 5°N*	*Entire Atlantic*	*Entire Atlantic*	*North Atlantic*
Date of entry into effect	*July 1, 1991*	*July 1, 1991*	*July 1, 1991*	*July 1, 1991*
Date of expiration	*Indefinite*	*Indefinite*	*Indefinite*	*Indefinite*
ANGOLA				
BENIN				
BRAZIL				
CANADA	yes	yes	yes	yes
CAPE VERDE				
COTE D'IVOIRE				
EQUATORIAL GUINEA				
FRANCE				
GABON				
GHANA				
GUINEA, Rep. of				
JAPAN				
KOREA, Rep. of				
MOROCCO				
PORTUGAL				
RUSSIA				
SAO TOME & PRINCIPE				
SOUTH AFRICA	Oct. 23, 1992	Oct. 23, 1992	Oct. 23, 1992	Oct. 23, 1992
SPAIN	Feb. 25, 1991	Feb. 25, 1991	Feb. 25, 1991	Feb. 25, 1991
URUGUAY				
USA	June 12, 1991	June 12, 1991	June 12, 1991	June 12, 1991
VENEZUELA				

NOTE: For more details on national regulations, please request information from the country's administration.

Appendix 1 to Annex 12

Agenda of the Infractions Committee

1. Opening of the meeting
2. Adoption of Agenda
3. Election of Rapporteur
4. Status of the application of the regulations recommended by the Commission on yellowfin, bigeye, bluefin, and swordfish
5. Collaboration of non-Contracting Parties in the objectives of the Commission
6. Review of port inspection:
   a) Acceptance of the Scheme by the Contracting Parties
   b) Review of the reports of inspections carried out
   c) Updating of the list of authorized inspectors
   d) Updating of the list of national correspondents
7. Future work of the Committee and plans for improvement
8. Date and place of the next meeting of the Infractions Committee
9. Other matters
10. Adoption of Report
11. Adjournment

Appendix 2 to Annex 12

Statement by the Chairman of the Infractions Committee

To a large extent, the work of ICCAT is judged by the work of the SCRS, and the scientific papers emanating therefrom. This is as it should be for a scientific commission, and the work of the SCRS is excellent, confirming that ICCAT's high international scientific reputation is well deserved. However, the real success of ICCAT as an international fisheries management commission is judged by other standards, the most important of these being: how the scientific work of the SCRS is translated into effective management recommendations; how these are implemented by member and non-member countries; and how successfully they are actually applied in the Atlantic tuna fisheries.

To date, the Infractions Committee has played a relatively minor role in ICCAT. The work of this Committee has been limited to a brief review each year of the implementation of ICCAT management recommendations, and an equally brief review of the progress of the Port Inspection Scheme. Relatively little critical discussion has been conducted on these issues, and it would appear that relatively little progress has been made by this Committee in improving the implementation of ICCAT management measures. This is unfortunate, because the Infractions Committee was formed to watch over the final results of ICCAT's work, to guide the implementation of the Commission's management recommendations and, thereby, to ensure their success.

It is understandable that no one likes to be watched over in this way, but self-appraisal and, where necessary, self-criticism are essential to the success of any management venture. Self-appraisal is certainly preferable, and potentially more successful, than external criticism. This brings me to the reason for these comments. The relatively minor role that the Infractions Committee has played in ICCAT affairs to date has perhaps contributed to the fact that ICCAT is now being closely watched by a number of outside organizations, who are less acquainted with the details of ICCAT's work, and therefore perhaps less able to provide the best constructive criticism of the Commission's management efforts.

In discussing the items on our Agenda today, I would like all delegates to continually bear in mind the original objectives of this Committee, and to critically evaluate our work against these objectives. We should then be in a position to critically consider the role of this Committee, and to suggest potential improvements, during our discussion of the future work of the Infractions Committee.

Appendix 3 to Annex 12

U.S. Statement to the Infractions Committee

The U.S. wishes to acknowledge the hard work of the Infractions Committee and its dedication to ensuring compliance by the member countries to the many recommendations and requests by ICCAT. However, in spite of this dedication, the U.S. notes that there are a number of areas where there appears to be disregard for some of the most important Commission recommendations. Failure to comply with recommendations reduces the credibility and effectiveness of ICCAT and makes negotiations with non-contracting countries on issues of concern to the Commission more difficult.

Specifically, as was brought to our attention by the thorough effort of the SCRS, there are critical problems with compliance to recommendations on eastern Atlantic bluefin. The information contained in the SCRS report is very disturbing to the U.S.

-- Of great concern in the east is the reported large catch of very small fish. We note that 33% of the reported catch in 1991 consists of fish less than 6.4 kg. This percentage has gone as high as 65% in recent years.

-- There also is a large catch of age zero fish. SCRS is requesting that there be no catch of fish less than 1.8 kg. We believe the catch of age zero bluefin may be significantly under-reported, and could be much higher than indicated in official statistics.

-- Also, and equally as important, the Commission made a recommendation in 1974 to cap fishing mortality at recent levels that was implemented in 1975. However, the estimate of the fishing mortality rate on ages 2-4 fish in 1991 is twice as much as that which occurred in 1975. Mortality rates for other ages are also significantly higher than those which occurred in 1975.

-- Sizes of spawning stocks are considerably smaller than in 1975.

-- The U.S. believes it would be irresponsible for the Committee to ignore these infractions. There should be a listing of the countries involved in the fishery and detailed statistics on their fisheries. We believe this Committee should insist on countries adhering to the current management recommendations limiting the catch of small fish and abiding by the 1974 recommendation on fishing mortality.

There have been reports of lack of diligence by some countries with respect to monitoring statistical reporting by fishermen or dealers. This could have serious implications on the validity of assessments that use these data. This Committee must look carefully at the statistical reporting procedures used by all countries. One way to start this process would be to request that all Countries submit detailed reports to the Committee outlining how statistical data on pelagic fisheries are collected and monitored by them.

Another area of concern, similar to the last point, is the way in which countries are implementing ICCAT recommendations. The U.S. notes that much of the discussion in this committee meeting last year concerned implementation of the 1990 ICCAT recommendations for Atlantic swordfish. The U.S. has provided the Secretariat with a detailed report of the procedures used to implement these recommendations. The U.S. proposes that this Committee request that all countries submit detailed annual reports on implementation of ICCAT recommendations.

Improved enforcement of regulations and detailed information on compliance is essential for the functioning of this organization. We are prepared to work with this Committee to see that its responsibilities are fulfilled.

ANNEX 13

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

First Session - November 9, 1992

1. Opening of the Meeting

1.1 In absence of the Chairman of STACFAD, Mr. D. Silvestre (France), the Chairman of Commission, Dr. A. Ribeiro Lima, decided to chair the sessions of the Committee. The Committee regretted the absence of Mr. Silvestre and thanked Dr. Lima for chairing the meeting.

2. Adoption of Agenda

2.1 The Executive Secretary reviewed the STACFAD Agenda point by point, particularly those items which require an immediate decision by the Commission or that may have financial repercussions. Dr. Fernández emphasized that Items 6, 7 and 8, which refer to the financial status of the first half of the biennial budget, the contributions pending payment by the Contracting Parties, and the review of the Working Capital Fund required a thorough review by the Committee. He also indicated that Item 12, concerning the review of financial implications of Commission activities in 1993, particularly as concerns research and statistics, should be carefully considered. Dr. Fernández referred the Committee to Agenda Item 13, the review of the second half of the biennial budget, and noted that he has presented a revised total budget figure which, more updated, reflects the needs for 1993.

2.2 The Chairman noted that in order to expedite this session, the Committee concentrate its discussions on Items 6, 7 and 8, which he considered to be the most important items of STACFAD. Dr. Lima also suggested that discussion of Agenda Item 16, the updating of the Staff Rules, be deferred until a later time so that the Commissioners would have more time to study this important item. He also indicated that due to time constraints perhaps it would be better to defer the adoption of these Staff Rules until the 1993 meeting of the Committee.

2.3 The Tentative Agenda, which was circulated in advance of the meeting, was adopted, without change, and is attached as Appendix 1 to Annex 13.

3. Election of Rapporteur

3.1 The Chairman nominated Mr. J. Pereira (Portugal) to serve as Rapporteur, and this was accepted by the Committee.

5. Auditor's Report - 1991

5.1 The Executive Secretary noted that the Auditor's Report, corresponding to Fiscal Year 1991, had been circulated to all the Contracting Parties in March, 1992, and that no comments had been received from the Contracting Parties. Dr. Fernández referred the Committee to the 1992 Financial Report (COM/92/9) which includes a statement on the status of Cash and Bank at the end of Fiscal Year 1991.

6. Financial Status of the 1st Half of the Biennial Budget - 1992

6.1 The Executive Secretary referred the Committee to Document COM/92/9, the 1992 Financial Report.

This report reflects in the most summarized way possible the financial status of the Commission.

6.2 As regards the financial status of Fiscal Year 1992, the Executive Secretary noted that the accounting of the Commission had been duly converted from a U.S. dollar based system to a convertible pesetas system, in accordance with a decision made by the Commission at its 1991 Meeting.

6.3 The Executive Secretary referred the Committee to Statement 2 of COM/92/9, the Financial Report, which showed the status of the contributions corresponding to 1992 (as of October 16). He pointed out that only eight Contracting Parties had paid their contributions up to that date. Twelve (12) Contracting Parties had not paid any amount towards their 1992 contribution, and eight of these have debts pending from other years.

6.4 The Executive Secretary noted that the Republic of Guinea had not been included in the table of contributions for 1992, since at that time, the FAO had not informed ICCAT of that country's membership. In early January, 1992, the contribution corresponding to this country for 1992 was established. Once this amount is paid, it will be deposited to the Working Capital Fund, so it will have no effect on the 1992 Regular Budget.

6.5 Dr. Fernández pointed out that the total contributions owed to the Commission at the time of the meeting towards the 1992 budget amounted to 56,798,912 Pesetas, or 45 % of the total budget. He emphasized that the total accumulated debt owed to the Commission amounted to 119,648,163 Pesetas.

6.6 The Executive Secretary noted that he had solicited extra-budgetary contributions from the Contracting Parties and from non-Contracting Parties, and as a result 2,933,092 pesetas were received.

6.7 The Executive Secretary informed the Committee that Japan, Côte d'Ivoire and Gabon had balances in their favor, due to overpayment of their contributions (See Statement 4 of the Financial Report); these amounts have been recorded as advances towards 1993 contributions.

6.8 The Executive Secretary informed the Committee that the cash balance in the Working Capital Fund at the time of the meeting showed a negative balance (estimated to the end of Fiscal Year 1992) of 13,381,983 pesetas. He also noted that, as a result, the estimated deficit in Cash and Bank amounted to 5,245,019 pesetas.

6.9 Dr. Fernández referred to Section V of the 1992 Financial Report and noted that unfortunately the financial situation of the Commission had not improved since last year. The Executive Secretary reminded the Committee of a Commission decision reached at the Third Regular Meeting (Paris, 1973), authorizing the Executive Secretary to seek a short-term bank loan, if necessary. He noted that, in view of the immediate shortage of cash, it would be necessary to establish, with the Commission's authorization, a line of credit. He indicated that he had contacted the banks and was informed that the annual interest rates would be about 16 % if the loan is in pesetas, and about 6 % if a loan is taken in U.S. dollars.

6.10 The Executive Secretary reiterated the need to adopt a special budget to replenish the funds in the Working Capital Fund. He referred the Committee to Article 7 of Financial Regulations and to the recommendation adopted by the Commission at its Second Regular Meeting (Madrid, 1971), that the Working Capital Fund should be maintained at a level of approximately 15% of the total annual budget.

6.11 The Chairman pointed out two important questions which require immediate action: (1) Commission agreement to authorize the underwriting of a policy to open a line of credit; and (2) Commission agreement to the adoption of special budgetary contributions to replenish the Working Capital Fund.

6.12 The Delegate of France informed the Committee that the 1992 contribution of France (13,721,426 pesetas), would be paid before the end of 1992.

6.13 The Executive Secretary thanked the Delegate of France. He observed that the contribution of France would not be deposited to the Working Capital Fund, since regular budget contributions are applied to meet expenses for the Fiscal Year. Dr. Fernández also stated that if the contribution of France could be paid by early December, this would alleviate the immediate financial strain.

6.14 The Delegate of Portugal informed the Committee that his country had recently paid its 1992 contribution to ICCAT and this money should be received shortly.

6.15 The Delegate of Spain stated that there is a need to be comprehensive with those countries who have real economic problems. He indicated that while the issue of credit for the Commission seems urgent, his delegation needed more time to study these matters.

6.16 The Executive Secretary pointed out that the only way to assure the financial health of the

Commission is for the Contracting Parties to respect their financial commitments. The line of credit policy would at least provide some mechanism to solve the immediate problem of the shortage of cash to pay salaries and office operating expenses. Bearing in mind the fact that the Commission will not meet until November, 1993, and in case that during the early months of 1993, the Commission is faced with a similar situation of a lack of funds, the Executive Secretary considers that it is essential to have the authorization of the Commission so as to be able to meet expenses that are absolutely necessary, through the use of funds from the line of credit.

6.17 The Delegate of Canada expressed his agreement with the need for an immediate decision, but indicated that if a loan is to be considered, he would like to have more information on the conditions and elements of this loan, particularly as regards establishing a ceiling (e.g., 10 % of the pending contributions). Mr. Rideout also expressed that he was not authorized to agree to any increase in commitments to any international fisheries organizations of which Canada is a member. Therefore, Canada could not support such action for the time being.

6.18 The Chairman requested that the Executive Secretary calculate the cost of the loan and present this study to the Committee for consideration. Dr. Lima asked the members of the Committee to study these proposals very carefully so that definitive decisions can be made at the next session of STACFAD.

Second Session - November 11, 1992

4. Administrative Report (1992 Activities)

4.1 The Executive Secretary presented the Administrative Report (COM/92/8), which provides details on 1992 Secretariat activities. In reviewing the report, by sections, Dr. Fernández made reference to the Conference of Plenipotentiaries held in June, the various meetings organized by ICCAT, the meetings at which the Commission was represented, particularly the 12th Week of Fisheries held in the Azores, and the FAO Technical Consultation on High Seas Fishing recently held in Rome.

4.2 Dr. Fernández made special mention of the tagging lottery which is held annually and which stimulates interest in this ICCAT program. With respect to ICCAT's collaboration with other organizations, the Executive Secretary cited, *inter alia*, the excellent collaboration maintained with FAO and the European Community throughout the year.

4.3 As regards the Commission's publications issued in 1992, the Executive Secretary referred the Committee to Section 9 of the Administrative Report, which provides details on this matter. Dr. Fernández reiterated the recommendation made at the 1991 Commission meeting to publish a testimonial book dedicated to the Commission's first Executive Secretary, Dr. Olegario Rodríguez Martín. He indicated that the SCRS had also discussed this matter in detail at its 1992 session, and made a specific proposal.

4.4 In referring to the section of the Administrative Report concerning "Secretariat and Administration", Dr. Fernández informed the Committee that Ms. Glenda Stephens, a member of the Secretariat staff for more than 12 years, had presented her resignation. He cited Ms. Stephens' excellent professional and personal qualities and, on behalf of the Secretariat staff, expressed his appreciation to her and wished her success in her new endeavors.

6. Financial Status of the 1st Half of the Biennial Budget - 1992 (Continued)

6.19 The Executive Secretary informed the Committee that the bank had just notified the Secretariat of the deposit of Portugal's contribution corresponding to Fiscal Year 1992, and he expressed his appreciation to the delegation of Portugal.

6.20 In response to a request by the Commission at the first session of STACFAD, the Executive Secretary presented the results of a study on the estimated cost of a loan under two scenarios, depending on the total of the 1992 contributions that are presently pending: (1) a loan based on the total unpaid 1992 contributions; and (2) a loan scenario based on contributions pending for 1992, but excluding the contribution of France). The study sets a ceiling, suggested at the First Session of STACFAD, for a maximum loan limit of 10 % of the total pending contributions as of the end of the 1992 Commission Meeting. Since the annual interest rates charged by the bank would be about 16 % if such a loan is in pesetas, and about 6 % if it is in dollars, the study applies the U.S. dollar rate, since it would be less costly to the Commission over the short-term.

6.21 The Delegate of Spain recognized the serious cash shortage in Commission funds, and regretted that a multi-lateral organization such as ICCAT would have to resort to a loan to alleviate its financial crisis. Mr. Conde expressed his country's concern that this solution could result in a means to avoid the payment of contributions in the future, and would penalize those Contracting Parties that do pay their contributions in a timely fashion. He also pointed out that if this problem of non-payment becomes a structural problem, then the Commission might have to consider the curtailment of some of its services, and indicated that this has to be studied very carefully. The Delegate of Spain indicated that he would prefer that a line of credit be opened, rather than a loan, so that the Commission would only be charged for money actually used.

6.22 The Delegate of Canada commented about some logistical aspects of this matter, such as: (1) establishing a ceiling of 10 % of the total contributions due as of the end of the 1992 Commission meeting; (2) that any income received be applied towards payment of the loan; and (3) that this be a temporary solution to the problem.

6.23 The Delegate of the United States agreed with the comments made by the Delegates of Spain and Canada. He recognized the economic difficulties of many countries in the international community and that most countries cannot increase their commitments to international organizations. However, Mr. Blondin stated that the arrears in contributions to the Commission has upset the order of ICCAT, and may hinder the participation of new members that might join the Commission, such as the EC. He noted that the Commission's efforts are frustrated and that the functioning of the Commission is seriously hindered by the financial problems caused by the contributions in arrears. Mr. Blondin indicated that he was not discouraging participation of any current ICCAT Contracting Party, but in view of the difficulties some countries to meet their financial obligations to the Commission, perhaps participation, in an observer capacity, might be a temporary solution, so as not to hinder the activities of ICCAT, until the new contribution scheme enters into force.

6.24 The Delegate of Portugal expressed agreement with the practical philosophy of the comments made by Spain and the United States. Referring to taking a loan in U.S. dollars or pesetas, the Delegate of Portugal inquired whether the loan should be made in a foreign currency which is dependent on fluctuation, when all the Commission's accounting records are in pesetas.

6.25 The Executive Secretary clarified that he had based his study on the cost of a loan in U.S. dollars only because the cost was much cheaper (6% annually for dollars vs. 16 % for pesetas). Dr. Fernández indicated that the final decision was up to the Commission and that the main issue was to alleviate ICCAT's financial difficulties over the short-term.

6.26 The Delegate of Brazil expressed his preference for a loan in dollars. He indicated that while his country cannot agree to an increase in its financial commitment to ICCAT, in this exception case, Brazil would accept the decision reached by the Commission concerning these financial issues.

6.27 The Delegate of Japan associated itself with the views expressed by the previous speakers. Japan recognized that the Commission's financial situation is very serious. However, he also indicated that ICCAT is facing an important phase in the international fisheries community, which requires an increase in activities and consequently, a healthy financial state. The Delegate of Japan indicated that his country was flexible, as regards improving the financial situation of the Commission.

6.28 The Delegate of Spain noted that there seemed to be a consensus that a loan is necessary, and that his delegation agreed with Canada's comments on the logistical aspects. He added that the loan should be conditioned by the immediate need to use these funds and recognized that some facility to assure cash flow to meet expenses was necessary. Mr. Conde also indicated that the Committee should work on the preparation of a resolution or other instrument to authorize the Executive Secretary to proceed to solicit a line of credit and thus be able to borrow funds when it is absolutely necessary.

6.29 The Chairman noted that there seemed to be a consensus as regards the need for a line of credit, bearing in mind the points raised by Canada as to some logistical aspects.

6.30 The Delegate of Canada referred to the comments made earlier by the Delegate of the U.S., concerning other possible solutions for the continuing problem of non-payment of contributions, and asked that the Committee discuss this matter further at a later session.

6.31 The Delegate of France expressed regret that his country had not yet paid its 1992 contribution, especially since France is the current Chairman of STACFAD. He informed the Committee that until he received further instructions from his government, he

wished to express some reservation as to the consensus being discussed.

6.32 In view of the reservation expressed by France, the Chairman noted that a final decision to solicit a line of credit would be postponed until a later session of STACFAD.

6.33 In closing the discussions on Agenda Item 6, Dr. Fernández thanked the Committee for its constructive attitude and for the confidence placed in him, which he will try to honor as long as he occupies the position of Executive Secretary of the Commission.

8. Review of the Working Capital Fund

8.1 The Executive Secretary referred the Committee to Statement 5 of Document COM/92/9, which showed the status of the Working Capital Fund. He noted that the Fund in November, 1992, amounted to 33,787,153 pesetas. There were expenses amounting to 47,169,136 (estimated to the end of the Fiscal Year). Dr. Fernández pointed out that, taking into account the contribution of Portugal which was recently received, the Working Capital Fund will show a negative balance of about 6,800,000 pesetas (estimated to the end of 1992).

8.2 Dr. Fernández noted that, in accordance with a decision of the Commission at it Third Regular Meeting (Paris, 1973), he solicited extra-budgetary contributions to replenish the Working Capital Fund. He indicated that since it appeared that the Committee would approve establishing a line of credit, and since the contribution of Portugal had been received and that of France can be expected, then extra-budgetary contributions to replenish the Working Capital Fund would not be absolutely necessary in the short-term.

8.3 The Delegate of Spain expressed his appreciation to the Executive Secretary for his austerity in handling the Commission's funds. The Committee decided, for the time being, not to discuss the proposal to replenish the Working Capital Fund.

9. Financial status of the Albacore Research Program

9.1 The Executive Secretary referred the Committee to Section II of the 1992 Financial Report (COM/92/9), as regards the status of the Albacore Research Program. The Program shows a balance of 1,363,609 pesetas, which has been carried over from 1991, since no expenses were incurred in 1992.

10. Financial Status of the Program of Enhanced Research for Billfish

10.1 The Executive Secretary again referred STACFAD to Document COM/92/9. He noted that, as of today's date, the balance in the Special Billfish Fund (which is accounted in U.S. dollars) amounts to about $7,000, and indicated that this balance would be sufficient to cover any expenses of the Program to the end of this Fiscal Year.

11. Financial Status of the Bluefin Year Program

11.1 Dr. Fernández noted that this Program had started in 1992 and that it did not require any funding by the Commission.

13. Review of the 2nd Half (1993) of the Biennial Budget Approved for 1992-1993

13.1 The Executive Secretary referred the Committee to Document COM/92/31, containing his proposal for revision of the budget approved for 1993. Dr. Fernández explained in detail the revised budget proposed for 1993. He indicated that it takes into account an estimated 6.9 percent inflation rate in the country of the ICCAT Headquarters as well as the recent 5 percent official devaluation of the Spanish currency. The revised total budget figure amounts to 133,172,000 pesetas, which represents, in current monetary terms, a 2.9 percent over the total budget of 129,402,000 pesetas approved provisionally by the Commission at the 1991 meeting, and an increase of 5.8 percent, also in current monetary terms, over the total budget of 125,840,000 approved for 1992.

13.2 Dr. Fernández noted that provision was made in the revised budget proposal to include "home leave" for two staff members and their families in 1993, which had not been included in the budget adopted provisionally for 1993.

13.3 The Executive Secretary noted that the proposed revised budget for 1993 shows, in essence, a negative increase, in real terms. He also pointed out that provision had been made for miscellaneous expenses in Chapter 7 and Sub-Chapter 8h and noted

that the total of these two figures represented about 1 percent of the total 1993 budget.

13.4 The Committee reviewed the tables attached to Document COM/92/31, the Proposed Revised Budget. These proposals were explained by Dr. Fernández. He recalled that the Republic of Guinea had not been included when the 1993 contributions of the Contracting Parties were approved provisionally by the Commission in 1991, since the Secretariat had not yet been informed of the Republic of Guinea's membership until after the 1991 Commission meeting had adjourned.

Third Session - November 12, 1992

12. Review of the Financial Implications of 1993 Commission Activities

12.1 Among those activities in research and statistics and inter-sessional meetings scheduled in 1993 that have financial implications, the Executive Secretary informed the Committee, in particular, of three proposed meetings to be held in 1993: (1) the meeting on the technical aspects of methodologies which account for individual growth variability by age, to be held at the St. Andrews Biological Station in Canada, at the invitation of Canada; (2) the first meeting of the Working Group to Evaluate Atlantic Yellowfin Tuna, to be held at the Tenerife Laboratory of the Spanish Oceanographic Institute; and (3) a GFCM meeting to be held in Malta, for which it is recommended that ICCAT take advantage to improve important statistics, particularly Mediterranean data on tunas and swordfish.

12.2 The Executive Secretary noted that since the 1993 meeting of the Commission will most likely be held in Madrid, there are no special budgetary implications foreseen.

13. Review of the 2nd Half (1993) of the Biennial Budget Approved for 1992-1993 (Continued)

13.5 In response to an inquiry from the Delegate of Canada concerning the costs charged to the budget chapter on the annual Commission meeting, the Executive Secretary responded that such costs included mainly the rental of the main conference room, a room for small group meetings, contracted staff to help in reception, interpreters, rental of simultaneous interpretation equipment, and overtime for the staff.

13.6 The Delegate of Canada further inquired whether the cost of staff overtime should be charged to salaries, rather than meetings, so that the meetings chapters would reflect only logistical costs.

13.7 The Delegate of Canada expressed his country's concern about the proposed increase in the Commission Budget for 1993. Mr. Rideout indicated that he had instructions from his government to maintain the budget at the level that was approved in 1991.

13.8 The Executive Secretary referred back to Canada's comments about the meeting costs and explained that while the cost of staff overtime was substantial, overtime was only utilized for the Commission and scientific meetings. Overtime has been essential to assure that all the working session documents and meeting reports are ready on a timely basis for review by the delegates in the three languages of the Commission. He pointed out that overtime during the SCRS and the stock assessment groups was also essential, given the volume and the complexity of the reports prepared by the scientists, and their need to use the Secretariat facilities until late in the night.

13.9 Dr. Fernández further explained that it was difficult to assess the cost for overtime beforehand, since this was determined by the needs of each particular meeting. Therefore, the practice that has been followed up to now has been not to include the cost of overtime in the salaries chapters, but in the meetings chapters, for more flexibility.

13.10 The Executive Secretary noted out that the provisional 1993 budget approved at the 1991 meeting did not include any provision for "home leave" for two staff member whose contract includes such an entitlement. He pointed out that the increase in the proposed revised 1993 budget for travel is reflected by the inclusion of this home leave. He noted that while, if necessary, travel of the Executive Secretary could be kept to an absolute minimum or even curtailed, the Commission should comply with the obligations established in the Staff Rules.

13.11. The Delegate of France indicated that his country favored the proposed revised budget of 133,172,000 pesetas for 1993.

13.12 The Delegate of Spain also indicated acceptance of the proposed revised budget.

13.13 The Delegate of the United States expressed his country's acceptance of the revised budget as proposed by the Executive Secretary.

13.14 The Delegate of Portugal also indicated acceptance of the revised budget proposed by the Executive Secretary.

13.15 The Delegate of Canada reiterated that his country could not support any increase in the budget for 1993.

13.16 The Chairman encouraged other delegations to voice their opinions on this important issue of the budget for 1993 and suggested that the matter be discussed later so as to give the members of the Committee more time to study this matter.

15. Draft Wording of the Modifications of the Financial Regulations to Include the New Scheme for the Calculation of Contributions and the Change in the Monetary Unit of the Commission Budget

15.1 The Executive Secretary presented Document COM/92/28, concerning the modification of the ICCAT Financial Regulations. He pointed that there were two types of modifications to be made: (1) to reflect a Commission decision made last year concerning the change in the budget base currency from "United States dollars" to "Convertible Pesetas". This modification affects Regulation 2.3 and Regulation 9.1; and (2) to reflect the amendment of Article X-2 of the Convention, once the Madrid Protocol is ratified and enters into force.

15.2 The Executive Secretary noted that even though the Protocol is not yet ratified by a sufficient number of the Contracting Parties to enter into effect, he considered it necessary that a draft text of the amendment be prepared in advance, in case ratification is completed within the next few months. Dr. Fernández pointed out that his draft text was based on the decision of the Conference of Plenipotentiaries to the effect that the Commission should, at its first meeting following the entry into force of the amendment of Article X, introduce in its Financial Regulations the new method to calculate the contributions.

15.3 The Delegate of the United States expressed his appreciation to the Executive Secretary for his draft text. He asked for clarification as to whether the Commission could modify the Financial Regulations before the Protocol formally enters into force.

15.4 Mr. Hallman, of the U.S. Delegation, also introduced a modification to the draft text of the Financial Regulations, to be added to the second paragraph of point 1, which would then read as follows: "The annual contributions towards the Commission budget for the joint expenses by each Contracting Party shall be set by agreement of all the Contracting Parties present and voting and shall be determined as follows:"

15.5 The Executive Secretary reiterated his proposal to the effect that no modification would be made to the Financial Regulations until the Protocol to amend Article X, paragraph 2, of the Convention is ratified. Dr. Fernández took due note of the modification presented by the U.S. Delegate and expressed the hope to have a previous agreement of the Commission during the meeting on a text, which will be formally approved at the appropriate time.

15.6 The Delegate of France supported the comments made by the Delegate of the United States.

15.7 The Delegate of Spain also wished to support the proposal made by the U.S. and indicated that there seemed to be a consensus among the Committee on this matter.

15.8 The Chairman noted that the approved text will be presented at the appropriate time so that the Commission can adopt the decision to modify accordingly its Financial Regulations.

15.9 The representative of FAO, Dr. D. Fadda, noted that he could see no difficulty to accept these proposed modifications to the draft text so as to make the text of the Financial Regulations more precise. Dr. Fadda offered to work closely with the Secretariat to polish the text of the current Financial Regulations (specifically Regulations 4 and 7) and Rule 9 of the Rules of Procedure, to adequately reflect the amendment of Article X, paragraph 2, of the Convention.

15.10 The Executive Secretary expressed appreciation to the FAO representative for all the collaboration provided this year on this matter.

15.11 The Delegate of South Africa suggested some changes, of an editorial nature, to the draft text of the Financial Regulations and due note was taken of these suggestions.

15.12 The Chairman pointed out that several important matters were still to be decided by the Committee, such as the need for a final consensus as regards the line of credit, as well as a final solution as regards the 1993 budget. He hoped that the Committee

members would come to the next and final session of STACFAD ready to make these important decisions.

Fourth Session - November 13, 1992

7. Contributions Pending Payment from the Contracting Parties

7.1 The Executive Secretary referred the Committee to Statement 2 of Document COM/92/9, which showed the status of the contributions of each of the Contracting Parties as of October 16, 1992, and he reiterated that 45 percent of the contributions corresponding to the 1992 budget was still pending as of the same date. The accumulated debt owed to the Commission for unpaid contributions amounted to 119,648,163 pesetas, as of October 16, 1992.

7.2 Several delegations expressed that there is a need to find a solution to the serious problem of non-payment by some Contracting Parties of their financial obligations to the Commission, and emphasized that such arrears seriously affects practically all ICCAT activities.

13. Review of the 2nd Half (1993) of the Biennial BudgetApproved for 1992-1993 (Continued)

13.17 The Delegate of France stated that his country was in favor of the Commission making a loan to alleviate the immediate financial difficulties, with the reservation, however, that such a loan should not entail any increase in the contributions that have been approved for 1993.

13.18 The Executive Secretary appreciated the support of France and clarified that any loan will have its corresponding interest expense, which should be taken into account. He indicated that consequently, some slight changes in the amounts allocated to certain budget chapters could be made to cover the interest expenses accrued.

13.19 The Chairman emphasized that the loan will only be made in very extreme conditions and only for an amount that is deemed absolutely necessary.

13.20 The Chairman then indicated that a consensus had been reached by the Committee to authorize the Executive Secretary of the Commission to underwrite a policy to open a line of credit, thus permitting the Executive Secretary to borrow money in cases of extreme shortage of cash to meet the payroll and office operating expenses.

13.21 The Committee reviewed the Draft Resolution, authorizing the Executive Secretary to underwrite a policy to open a line of credit with a bank, when absolutely necessary, and which provides guidelines concerning the maximum limit of the loan, the guaranty of the loan based on the commitment of the Contracting Parties to finance the budget, repayment of the loan, and periodic information to be provided by the Executive Secretary.

13.22 The Committee approved the Resolution authorizing the Executive Secretary to solicit a bank loan, which is attached as Appendix 2 to the STACFAD Report, and recommended it to the Commission for adoption.

13.23 The Delegate of Canada reiterated his reservations as concerns the 1993 budget, and indicated that, in a spirit of collaboration, Canada would support the revised budget for 1993. Mr. Rideout also recommended that the Executive Secretary present at next year's meeting a budget that will be as close as possible to a zero increase, in terms of pesetas, for 1994.

13.24 The Delegate of Canada noted that the inquiries he made at an earlier session of STACFAD concerning the expenses for overtime were to clarify in what budget chapters such expenses were charged. He commended the Secretariat staff for the excellent work they carry out at the meetings and throughout the year.

13.25 The Delegate of the United States referred to the revised budget for 1993 and indicated that this total budget represented a 5.8 percent increase, rather than a 2.9 percent increase, as pointed out by the Executive Secretary in an earlier intervention.

13.26 The Executive Secretary clarified that the revised total budget figure of 133,172,000 pesetas for 1993 represents a 5.8 percent increase over the 1992 budget (125,840,000 pesetas), whereas it represented only a 2.9 percent increase, as compared to the budget approved provisionally for 1993 (i.e., 129,402,000 pesetas).

13.27 The U.S. Delegate thanked the Executive Secretary for his explanation, and reiterated that his country could accept the revised budget for 1993.

13.28 The Delegate of Venezuela expressed his support for the revised 1993 budget as presented by the Executive Secretary.

13.29 The Delegates of South Africa, Brazil, Morocco, Japan, Russia, Sao Tomé and Korea also indicated their support of the revised budget of 133,172,000 pesetas for 1993.

13.30 The Executive Secretary expressed his appreciation to all the delegates for their support of the revised budget. He referred to the recommendation made by the Delegate of Canada as regards a zero increase, in terms of pesetas, for the 1994 budget, and pointed out that such a budget would actually mean a decrease, in real terms, which could then mean a reduction in Secretariat activities.

13.31 The Committee approved the revised budget of 133,172,000 for 1993, which is attached to this report as Table 1, and recommended it to the Commission for adoption.

14. Contributions of the Contracting Parties to the 1993 Budget

14.1 The revised contributions of the Contracting Parties corresponding to Fiscal Year 1993, as presented by the Executive Secretary, were reviewed by the Committee, and are attached to this Report as Table 2. These contributions correspond to the revised total budget of 133,172,000 pesetas, as approved by the Committee.

14.2 The Executive Secretary, in referring to the 1993 country contributions, pointed out that the calculations were based on current Commission and Panel membership and on 1989 catch and canning data. He also indicated that the Republic of Guinea, the newest Contracting Party of the Commission, has also been included in the table of regular contributions for 1993.

14.3 The Committee approved the 1993 contributions of the Contracting Parties, as shown in the attached Table 2, and recommended them to the Commission for adoption.

16. Updating of the Staff Rules

16.1 Following a suggestion made at the time of the Twelfth Regular Meeting of the Commission (Madrid, November 1991), the Executive Secretary presented in Document COM/92/31, a "Draft of the ICCAT Staff Regulations and Rules", which concerns updating and/or modifying the current Staff Rules. He pointed out that the last edition of these ICCAT Staff Rules was issued in 1983. Dr. Fernández emphasized the importance of this document and recognized that its review could require considerable study by the Committee.

16.2 In view of time constraints at this meeting of STACFAD, the Chairman of the Committee proposed that the members of the Committee carefully review this document, and direct any inquiries to the Executive Secretary during the year, and then be prepared to discuss it at the 1993 meeting of the Committee. The Committee agreed with this proposal.

17. Date and Place of the Next Meeting of STACFAD

17.1 The Committee agreed that the next meeting of the Standing Committee on Finance and Administration (STACFAD) would be held during the same week and at the same place as the 1993 meeting of the Commission.

18. Other Financial and Administrative Matters

18.1 There were no other matters of a financial and/or administrative nature discussed.

19. Adoption

19.1 The reports of the First, Second and Third Sessions of STACFAD were adopted by the Committee at its Final Session. Due to time constraints, the Committee decided to adopt the report of the final session, as well as the Report in its entirety, by correspondence.

20. Adjournment

20.1 The Committee thanked Dr. A. Ribeiro Lima for the excellent chairing of the 1993 STACFAD sessions.

20.2 Dr. Lima appreciated the expressions of congratulations from the Committee. He thanked all the delegates for their collaboration in approving the 1993 budget and contributions. He commended the Executive Secretary and his staff for their efficient work through the session. Dr. Lima also thanked the interpreters.

20.3 The 1992 meeting of the Standing Committee on Finance and Administration (STACFAD) was adjourned on November 13, 1992.

Table 1. Revised Budget adopted for 1993 (in 1,000 Pesetas)

CHAPTERS	1992 BUDGET (A)	PROVISIONAL BUDGET APPROVED FOR 1993 (B)	REVISED BUDGET ADOPTED FOR 1993 (C)
1. Salaries	68,016	71,417	71,417
2. Travel	1,040	1,092 *	3,121 **
3. Commission Meeting	5,200	5,460	5,564
4. Publications	3,120	3,276	3,276
5. Office Equipment	728	764	764
6. Operating Expenses	9,568	10,046	10,237
7. Miscellaneous	520	546	1,254
Sub-total Chapters 1-7	88,192	92,602	95,633
8A. Salaries	19,760	20,748	20,748
8B. Travel	1,040	1,092	1,113
8C. Port Sampling	1,560	1,638	1,638
8D. Biostatistical Work	1,248	1,310	1,310
8E. Electronic Equipment	1,560	1,638	1,638
8F. Data Processing	3,952	4,149	4,149
8G. Scientific Meetings	5,928	6,224	6,343
8H. Miscellaneous	0	0	600
8I. Albacore Research Program	0	0	0
8J. Billfish Research Program ***	0	0	0
Sub-total Chapter 8	35,048	36,800	37,539
Sub-total Chapters 1-8	123,240	129,402	133,172
Conference of Plenipotentiaries	2,600	0	0
TOTAL BUDGET	125,840	129,402	133,172

* "Home Leave" was not included.
** "Home Leave" is included for 1993.
*** Funded by the Trust Fund for Billfish Research.

Table 2. Member country contributions to the 1993 Commission Budget (Based on the Revised Budget adopted for 1993)

Based on 1989 figures

Country	Panel # (A)	Panel % (B)	Catch MT (C)	Canning MT (D)	C+C MT (E)	C+C % (F)	Fee Conv. Pts (G)	Panel Conv. Pts (H)	Panel Conv. Pts (I)	C+C Conv. Pts (J)	Total Conv. Pts (K)
			Total Budget (Convertible Pesetas)				**133,172,000**				
Angola	2	4.918	609	244	853	0.142	104,000	208,000	2,079,148	119,669	2,510,817
Bénin	0	1.639	444	0	444	0.074	104,000	0	693,049	62,290	859,339
Brasil	2	4.918	21,023	1,475	22,498	3.733	104,000	208,000	2,079,148	3,156,294	5,547,441
Canada	2	4.918	1,940	4,974	6,914	1.147	104,000	208,000	2,079,148	969,980	3,361,128
Cap Vert	1	3.279	4,675	177	4,852	0.805	104,000	104,000	1,386,098	680,698	2,274,796
Côte d'Ivoire	1	3.279	5,120	8,000	13,120	2.177	104,000	104,000	1,386,098	1,840,634	3,434,732
España	4	8.197	155,661	36,743	192,404	31.924	104,000	416,000	3,465,246	26,992,779	30,978,025
France	3	6.557	57,600	22,883	80,483	13.354	104,000	312,000	2,772,197	11,291,137	14,479,333
Gabon	1	3.279	0	0	0	0.000	104,000	104,000	1,386,098	0	1,594,098
Ghana	1	3.279	47,091	0	47,091	7.814	104,000	104,000	1,386,098	6,606,500	8,200,598
Guinea Ecuatorial	0	1.639	400	0	400	0.066	104,000	0	693,049	56,117	853,166
Guinée, Rép. de	0	1.639	0	0	0	0.000	104,000	0	693,049	0	797,049
Japan	4	8.197	63,355	0	63,355	10.512	104,000	416,000	3,465,246	8,888,212	12,873,458
Korea, Rep. of	3	6.557	12,512	0	12,512	2.076	104,000	312,000	2,772,197	1,755,336	4,943,533
Maroc	2	4.918	3,320	210	3,530	0.586	104,000	208,000	2,079,148	495,231	2,886,379
Portugal	3	6.557	13,299	13,198	26,497	4.396	104,000	312,000	2,772,197	3,717,322	6,905,519
Russia	2	4.918	20,472	294	20,766	3.446	104,000	208,000	2,079,148	2,913,308	5,304,455
S.Tomé & Principe	1	3.279	330	0	330	0.055	104,000	104,000	1,386,098	46,296	1,640,395
South Africa	1	3.279	6,670	67	6,737	1.118	104,000	104,000	1,386,098	945,149	2,539,247
U.S.A.	4	8.197	26,427	37,076	63,503	10.537	104,000	416,000	3,465,246	8,908,975	12,894,221
Uruguay	0	1.639	522	0	522	0.087	104,000	0	693,049	73,233	870,282
Venezuela	2	4.918	32,875	2,999	35,874	5.952	104,000	208,000	2,079,148	5,032,842	7,423,990
Total	39	100	474,345	128,340	602,685	100	2,288,000	4,056,000	42,276,000	84,552,000	133,172,000

A: Panel membership.
B: % annual and panel membership (G+H).
C: Catch (live weight).
D: Canned production (net weight).
E: Total (C+D).
F: Percentage distribution of E.
G: Pesetas equivalent to $1000 annual membership fee (at the time of calculation).
H: Pesetas equivalent to $1000 for each panel membership (at the time of calculation).
I: 1/3 of (Total less G+H) distributed according to col. B %.
J: 2/3 of (Total less G+H) distributed according to col. F %.
K: Total (G+H+I+J)

Appendix 1 to Annex 13

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

1. Opening of the meeting
2. Adoption of Agenda
3. Election of Rapporteur
4. Administrative Report (1992 activities)
5. Auditor's Report - 1991
6. Financial status of the 1st half of the biennial budget - 1992
7. Contributions pending payment from the Contracting Parties
8. Review of the Working Capital Fund
9. Financial status of the Albacore Research Program
10. Financial status of the Program of Enhanced Research for Billfish
11. Financial status of the Bluefin Year Program
12. Review of the financial implications of 1993 Commission activities:
    - -- Research and statistics
    - -- Intersessional meetings
    - -- Publications
    - -- Next Commission meeting
    - -- Others
13. Review of the 2nd half (1993) of the biennial budget approved for 1992-1993
14. Contributions of the Contracting Parties to the 1993 budget
15. Draft wording of the modifications of the Financial Regulations to include:
    - -- the new scheme for the calculation of contributions
    - -- the change in the monetary unit of the Commission budget
16. Updating of the Staff Rules
17. Date and place of the next meeting of STACFAD
18. Other financial and administrative matters
19. Adoption of Report
20. Adjournment

Appendix 2 to Annex 13

Resolution Authorizing the Executive Secretary
to Open a Line of Credit

The International Commission for the Conservation of Atlantic Tunas (ICCAT) hereby authorizes the Executive Secretary to underwrite a policy to open a line of credit, in United States dollars, from the Banco Exterior de España, where the Commission has maintained accounts since it opened its office in Madrid, Spain in 1970.

The Commission recommends that the maximum limit of this line of credit be established at 10 percent of the total contributions pending payment at the end of the current Commission meeting. If there should be a shortage of cash to pay absolutely essential expenses of the Secretariat, the Executive Secretary, after prior consultation with the Chairman of the Commission and the Chairman of the Standing Committee on Finance and Administration (STACFAD), is hereby authorized to solicit a loan from this line of credit for the amount considered absolutely necessary to meet these expenses. It is understood that the interest rate will be that applicable by the Banco Exterior de España to loans in

U.S. dollars at the time the loan is made, and shall be payable only on that amount that is borrowed.

The Commission authorizes that the commitment of all the Contracting Parties to finance the 1993 Budget approved by the International Commission for the Conservation of Atlantic Tunas (ICCAT), be considered as a guaranty to solicit the loan. Consequently, all contributions received corresponding to the Regular Commission Budget shall be deposited in the Banco Exterior de España.

The Commission requests that income received from the payment of contributions towards the 1993 or previous budgets be applied, inasmuch as possible, to pay off the loan, as soon as possible, so as to avoid excessive interest costs to the Commission.

The Commission requests that, in the case that credit is utilized, the Executive Secretary provide detailed information concerning the amount of the loan, the rate of interest applied, payments due, etc., to the Commissioners, on a quarterly basis.

ANNEX 14

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

(Madrid, November 2-6, 1992)

1. Opening of the Meeting

Dr. J. L. Cort, Chairman of the Standing Committee on Research and Statistics (SCRS), opened the 1992 SCRS Plenary Session of the Committee. He reviewed briefly the various inter-sessional meetings held by ICCAT in 1992, and the work carried out by the Commission. Dr. Cort pointed out the important work to be done during this session.

Dr. A. Fernández, the Executive Secretary of the Commission, addressed the Committee and expressed his satisfaction in having this opportunity to address the participants of the SCRS, since this is his first SCRS meeting since joining ICCAT. He commended the progress made by the SCRS in the past and stressed the importance of the Committee in the Commission's work. While doing so, the Executive Secretary reminded all the participants of their responsibility to carry out adequate scientific research and stock assessments. He referred to the substantial increase in the number of the scientific contribution papers at this year's SCRS, and expressed confidence that the scientific body would make good progress in its work at this session, and would provide sound scientific advice to the Commissioners and to all those persons interested in these matters. Dr. Fernández also referred to the financial problems of the Commission, which he hoped would be solved in the near future by the Commission's adoption of the new contribution scheme.

2. Adoption of Agenda and Arrangements for the Meeting

The Tentative Agenda was presented and the Executive Secretary provided some detail on the new items added this year. The Agenda was adopted and is attached to this report as Appendix 1 to Annex 14.

The following scientists served as rapporteurs for the 1992 SCRS Report:

Agenda Item 12: Review of conditions of stocks

Tropical Tunas (General)		A. Fonteneau
YFT:	Yellowfin	P. Pallarés
BET:	Bigeye	J. Pereira
SKJ:	Skipjack	J. Ariz
ALB:	Albacore	F. X. Bard
BFT:	Bluefin	B. Liorzou
BIL:	Billfish	E. Prince
SWO:	Swordfish	Z. Suzuki
SBF:	Southern bluefin	Y. Ishizuka*
SMT:	Small tunas	A. Srour

All other SCRS Agenda items: P. M. Miyake

3. Introduction of Delegations

The scientific delegations of all the Contracting Parties were introduced. The List of the Participants is attached as Appendix 2 to Annex 14.

* Not present at the 1992 SCRS Meeting; Draft report was presented through correspondence.

4. Admission of Observers

The observers were introduced and duly admitted, since they had all been invited in accordance with the criteria approved by the Commission. The list of observers is also included in Appendix 2 to Annex 14.

5. Admission of Scientific Documents

The Committee noted that there were 175 scientific documents presented at this session (see Appendix 3 to Annex 14). Since there are some that did not meet the criteria set up for acceptance of documents established by the SCRS, the Committee decided to set up a group to review these documents for admission. The group later reported its decision on the various documents, which was reiterated by the Committee. The group's report is attached as Appendix 4 to Annex 14.

6. Review of National Fisheries and Research Programs

6.1 *BRAZIL*

In 1991 the longline fleet consisted of 17 Brazilian vessels and 14 chartered vessels (11 with Taiwanese flag). The baitboat fleet consisted of 53 Brazilian boats and 4 chartered Japanese flag vessels.

Preliminary data for 1992 show that the Brazilian longline fleet increased to 21 boats while the leased Taiwanese fleet increased to 15 vessels.

There is a lack of data on a number of boats operating in artisanal fisheries in the northeast region of Brazil.

The 1991 total catch of tunas and tuna-like fishes was 24,647.1 MT, but data are incomplete since catches by Santos-based longliners and by the artisanal fisheries are not yet available.

Catches by leased longliners amounted to 2,747 MT, exceeding the past highest catch of 2,284 MT, recorded in 1986. Until 1990, the dominant species in the catches were bigeye and swordfish. In 1991, as a result of operations of the Taiwanese fleet, species composition changed and showed, for the first time, the predominance of albacore in the catches.

Preliminary estimates for 1992 indicate catches of 3,724 and 380 MT, respectively, for the Taiwanese and Japanese longline fleets. The total catch by baitboats was 22,072 MT, of which 73 percent was taken by national baitboats. Skipjack continues to be the dominant species caught by the baitboats, followed by yellowfin. The majority of the yellowfin catches are taken by Brazilian baitboats based in Rio de Janeiro.

The collection of statistics and size samples from the baitboat fleet continued in 1991. Some problems have been experienced in data collection in Rio de Janeiro, since 1990, which resulted in low sampling coverage for length and a low recovery rate of logbook records in 1991. However, sampling activities were resumed in 1992. Yellowfin sampling for both length and weight was started in 1992, to study seasonality in the length-weight relationship.

Sampling for size frequency was also carried out on yellowfin caught by Brazilian longliners in northeastern Brazil.

The ICCAT Data Preparatory Meeting for Southwest Atlantic Tuna Fisheries was hosted in 1991, at the Federal Rural University of Pernambuco (July 1 to 7), in which a significant improvement in Brazilian statistics was achieved.

Regarding shark fisheries, information available shows that there has been an increase in shark catches in the tuna fisheries. The shark catches now represent about 40 percent of the total catches of Brazilian longliners. The blue shark (*Prionace glauca*) is the species that is most caught, representing nearly 38 percent of the total catches from this fleet.

6.2 *COTE D'IVOIRE*

Landing and transshipment activities at Abidjan, mainly from the foreign fleet, remained at 150,000 MT in 1991. A lesser amount is foreseen for 1992, for economic reasons.

The "Centre de Recherches Océanographiques" assures the statistical monitoring and biological studies (reproduction, feeding, migration). There was special coverage of billfish landings.

6.3 *FRANCE*

French tuna catches rose to 81,500 MT in 1991, which is the record high of the last ten years and was due mainly to the high catches of tropical tunas.

In the Mediterranean in the 1991 fishing season, 24 purse seiners caught 4,570 MT of bluefin tuna. The

Atlantic bluefin catches for the same year remained at a low level (565 MT).

In the Atlantic, fishing for albacore was carried out in the summer of 1991 by 47 gillnet vessels and 23 pairs of pelagic trawlers, which landed 3,660 MT and 460 MT of albacore, respectively.

The catches of tropical tunas made in 1991 by French boats reached a record high of 72,200 MT, of which 34,200 MT were yellowfin and 31,400 MT were skipjack. There was an increase in purse seine fishing effort (three more purse seiner vessels) and a decrease in baitboat effort (from 17 to 9 vessels).

Research on these fisheries and on the species they exploit was carried out as in the past by the scientists of IFREMER (temperate tunas) and ORSTOM (tropical tunas, in collaboration with various countries, such as: Côte d'Ivoire, Senegal, Venezuela). A summary of this research was submitted to the SCRS in 1992.

6.4 JAPAN

The 1991 Japanese catch of Atlantic tunas and billfishes was estimated at 48,627 MT. This represented a decrease of about 10,000 MT from 1990, due mainly of Japanese fishing effort in the Atlantic. More than 90 percent of the total catch was taken by longline gear, and the remainder was taken by purse seine. The largest species component in the catch was bigeye tuna, which represented approximately two-thirds of the total catch in terms of weight, followed by swordfish, yellowfin and bluefin tunas. There were no substantial changes in these fisheries, except for the longline fishery, which has recently intensified fishing operations in the higher latitudes of the central north Atlantic (30°W-50°W) in the winter months, where little fishing took place in the past.

The fishery statistics were compiled by scientists of the National Research Institute of Far Seas Fisheries (NRIFSF) and submitted to ICCAT as in the past. Major research activities for tunas and billfishes were continued on the following: development of the standardized abundance indices and assessment techniques, studies on biology such as maturity and fecundity, and genetic studies in relation to stock structure. Japan participated in, and contributed to, all the 1992 inter-sessional meetings, i.e., the Data Preparatory Meeting for the Southwestern Atlantic, the Billfish Workshop, the Second GFCM/ICCAT Joint Consultation on Stocks of Large Pelagic Fishes in the Mediterranean, the Swordfish Stock Assessment Session, and the Albacore Stock Assessment Session.

6.5 KOREA

The 1991 total catch of tunas and tuna-like fishes amounted to 1,876 MT, taken by nine longliners, which showed a decrease of 57 percent as compared to the 1990 catch. Bigeye tuna remained the major species in 1991. Bigeye and yellowfin catches amounted to 801 MT and 260 MT, respectively.

The National Fisheries Research and Development Agency (NFRDA) has been in charge of collecting and processing the tuna fishing data. Catch and effort data as well as size data on tunas and tuna-like fishes for 1991 were submitted to ICCAT.

6.6 MOROCCO

During 1991, the total catch of tunas and tuna-like species off the coast of Morocco amounted to about 4,250 MT, of which 70 percent was caught by the coastal fleet and 30 percent by the traps. These catches declined by approximately 20 percent, as compared to 1990. The most important species in the catch was bluefin tuna, followed by swordfish and small tunas (frigate tuna and bonito).

These species were caught by artisanal longliners operating near the base ports. The vessels normally use surface gears. The purse seiners also take tuna as by-catch. It should be noted that tuna fishing with traps has recently regained interest.

A program was initiated this year at the port of Nador to collect size data of swordfish and fishing effort data of longliners based at that port.

6.7 PORTUGAL

Portuguese tuna fishing takes place mainly in the Azores and Madeira, where the local baitboat fleets seasonally catch tuna with live bait. A longline fleet targeting swordfish operates off the continental Portuguese coasts and in Azorean waters.

In 1991, the catches of tunas and tuna-like species rose to 15,736 MT, of which 5,559 MT were bigeye, 8,044 MT were skipjack, 709 MT were albacore and 1,424 MT were other species.

The total catch for 1991 increased by 2,491 MT compared to 1990, but continued to be lower than the catches of the recent past. This is mainly due to a very sharp drop in Azorean catches, although there has been a significant increase in Madeiran catches.

This trend continued in 1992, and the preliminary estimates of catches taken in the first three quarters indicated a catch of 4,750 MT for the Azores and 6,110 MT for Madeira.

Modernization of the baitboats continued. In the Azores, three new baitboats entered the fishery in 1991. In Madeira, changes in the baitboat fleet resulted in three new baitboats entering the fishery in 1991 and six in 1992.

Research activities, port sampling and collection of statistics continued in a satisfactory manner as in the past.

6.8 *RUSSIA*

In 1991, the total catch of tunas and related species amounted to 9,189 MT, including 3,200 MT of yellowfin tuna, 1,175 MT of skipjack, 617 MT of black skipjack, 1,078 MT of frigate mackerel, and 948 MT of bullet tuna.

The fishery was carried out mainly in traditional areas of the central east Atlantic. Purse seine catches amounted to 5,423 MT, and catches by trawlers reached 3,766 MT.

Scientific research consisted of a biological analysis of fishery statistics, studies of tuna distribution, age composition of catches and some behavioral aspects and reproduction biology of tunas, and a study on sharks.

6.9 *SOUTH AFRICA*

Catch and effort of the South African surface baitboat fishery decreased sharply during 1991 as a result of restricted access to Tripp Seamount. The reported catch decreased by 41% to only 2,849 MT, the lowest catch since 1984. Albacore provided 95 percent of the catch. By-catches of yellowfin and bigeye tunas declined to very low levels. The demersal trawl fishery reported a 5 MT by-catch of swordfish in trawling operations and a sport fishery also started to develop on this species.

Data from tuna dealers confirmed that tuna catches have been under-reported in logbooks. Catch totals were therefore revised based on dealer returns and reported to ICCAT.

Sampling effort was directed at sampling of Taiwanese longlined albacore on behalf of the ICCAT Port Sampling Program. 2,488 albacore were measured from 31 Taiwanese longliners transshipping 2,673 MT of albacore and 77 MT of other tunas in Cape Town harbour. A limited morphometric sampling program was also initiated to determine conversion formulae for use in a revised assessment of south Atlantic albacore at the 1993 SCRS meeting.

A new bottom longline fishery developed targeting adult hake (*Merluccius* sp.). The catch of sharks in this fishery increased rapidly, resulting in the issue of 21 directed shark longline permits. Shark CPUE trends in this fishery will be closely monitored.

6.10 *SPAIN*

Spanish catches of tunas and swordfish rose to 187,154 MT in 1991, 14 percent above the mean catch of the last four years. This increase was due basically to the catches of tropical tunas (skipjack and bigeye catches increased by 56 percent). The catches of the other species, including yellowfin, decreased to a greater or lesser degree.

In 1991, four tagging cruises were carried out: two on juvenile bluefin in the western Mediterranean, financed by the EEC, one on albacore in the Bay of Biscay, and one on skipjack in the Canary Islands. Opportunistic tagging of swordfish was continued. Likewise, the systematic collection of catch, effort and size samples from the different fisheries, as well as biological sampling (maturity and sex ratio) of bluefin and swordfish continued. In 1991, a study was initiated on the feeding of skipjack.

6.11 *UNITED STATES*

Total reported U.S. landings of tuna and tuna-like fishes (excluding billfishes, king and Spanish mackerels) from the Atlantic Ocean, Gulf of Mexico and Caribbean Sea in 1991 were 15,697 MT. This represents an increase of 1,104 MT from 1990. Swordfish landings made by U.S. vessels decreased by 1,240 MT from 1990 to 4,254 MT in 1991. U.S. vessels fishing in the northwest Atlantic killed an estimated 1,780 MT of bluefin, an increase of 11 MT compared

to the revised estimate for 1990. An estimated 199 MT of bluefin were discarded dead by U.S. longline vessels in 1991 (compared to 133 MT in 1990). Yellowfin tuna landings increased 582 MT over the 1990 level, although landings from the U.S. fishery for yellowfin in the Gulf of Mexico decreased in 1991 to 3,217 MT, down from 3,610 MT (revised) in 1990. Skipjack landings increased by 534 MT to 774 MT. Bigeye landings increased by 283 MT to 933 MT, and albacore landings decreased by 41 MT to 345 MT.

Major research activities on large pelagics in 1991 and 1992 included continued monitoring of landings and size of swordfish, bluefin tuna, and other large pelagic species; initiation of observer sampling in the U.S. large pelagic fleet; initiation of research activities in response to the ICCAT Bluefin Year Program (BYP); continuation of activities responsive to ICCAT-recommended research primarily directed at determining the reproductive biology of Atlantic swordfish; investigation into development of new indices of abundance for swordfish; participation in the 1992 ICCAT Swordfish Stock Assessment Meeting in Madrid, Spain; continuation of port and tournament sampling for billfishes and other pelagics; coordinating further increased efforts related to the ICCAT Enhanced Research Program for Billfish; continuation of bluefin larval surveys; and hosting the Second ICCAT Billfish Workshop at its Miami Laboratory. The cooperative tagging program tagged and released 7,653 billfishes and 2,079 tunas in 1991, increases of 10 percent and 65 percent over 1990, respectively.

6.12 VENEZUELA

In 1991, the catches of tunas by the Venezuelan fleet in the Caribbean Sea and western Atlantic rose to 28,896 MT, representing an increase of about 11,873 MT (70 percent) with respect to 1990.

This increase is attributed in part to the increase in purse seine and baitboat effort.

The collection of catch data and other fishery statistics has improved significantly due to the active participation of various institutions (FONAIAP, D.G.S.P.A., and ORSTOM) and to the implementation of multi-species sampling, as well as to improvement in the collection of logbooks.

As regards research, Venezuela promotes activities related to tunas and tuna-like species (billfish and swordfish) through commercial and artisanal fishing, with the support of the ICCAT programs.

The results of the research carried out in 1991 were presented to the SCRS in 1992. Some are found in documents SCRS/92/74, 78 and 121.

6.13 CARIBBEAN COMMUNITY AND COMMON MARKET (CARICOM)

During 1991/1992, the CARICOM Fisheries Resource Assessment and Management Program initiated several subprojects in the twelve participating countries. In the area of institutional strengthening, the subprojects to enhance the Fishery Management Planning, Data and Information Systems, and Licensing and Registration are most relevant to ICCAT activities. In April, 1992, the Program established the Pelagic and Reef Fishes Resource Assessment Unit, in St. Vincent and the Grenadines. This Unit has completed a survey of fishery assessment needs in the participating countries, and is developing proposals for their consideration. The most significant changes in pelagic fisheries in CARICOM were in Grenada, St. Vincent and the Grenadines, and St. Lucia where 8, 5 and 5 new 15 m longline vessels became operational during the year. In St. Lucia, 20 (of 40) new 9 m vessels also went into operation.

6.14 TAIWAN

The Taiwanese tuna fishery which operates in the Atlantic only uses longline gear. The number of vessels in 1991 was 135, which was slightly less than in 1990 (145). Most of these vessels apparently operated in the south Atlantic. There have been no significant changes in fishery pattern since 1989 and no new gears were introduced in 1991.

Total catches decreased slightly from 34,300 MT in 1990 to 30,619 MT in 1991. This decrease corresponded mostly to the north Atlantic (7,256 MT in 1990 to 3,531 MT in 1991).

In the north Atlantic, 1991 catches were estimated at about 3,531 MT, which resulted in a significant decrease of about 51 percent from 1990 catches, and the decline corresponded to catches of species targeted by deep longline. The bigeye catch decreased from 2,803 MT in 1990 to 440 MT, and yellowfin from 2,117 MT in 1990 to 689 MT. The albacore catch (1,574 MT) was similar to that of 1990 (1,512 MT).

In the south Atlantic, catches in 1991 were estimated to be about 27,088 MT, which was similar to

that of 1990 (27,048 MT). Albacore was the predominant species (20,345 MT) and represented about 75 percent of the total. The bigeye catch decreased sharply from 2,096 MT in 1990 to 301 MT, and yellowfin catches dropped from 998 MT in 1990 to 541 MT in 1991. Catches of billfish and other species increased to maintain the total in the south Atlantic at the 1990 level.

7. Reports of 1992 Inter-sessional Scientific Meetings

-- *Data Preparatory Meeting for the Southwestern Atlantic (Recife, Brazil - July, 1992)*

The Report of the Data Preparatory Meeting (SCRS/92/15) was presented by the Rapporteur of the meeting, Dr. P. M. Miyake, and supplementary comments were presented from Dr. J. H. Meneses de Lima (Brazil), who hosted the meeting. The Committee was informed that southwest Atlantic tuna statistics (particularly for Brazil) were fully reviewed during the Recife meeting. Brazilian statistics, which were previously all combined for the country, were separated by base ports and the availability of size and catch/effort data was reviewed by such units. There were substantial improvements in the catch statistics (e.g., logbook catch was adjusted by landing weight, gilled and gutted weight was converted to round weight, etc.) and in Task II catch and effort and size data. A coordinated statistical collection system was started in Brazil and this effort will improve future statistics and will also make available the past data that had been collected but not been processed.

-- *CWP Meeting (Halifax, Nova Scotia, Canada - July, 1992)*

The Report of the CWP Meeting (COM-SCRS/92/7) was presented by the ICCAT Assistant Executive Secretary, who represented the ICCAT at this meeting. The Committee was informed that the CWP had discussed difficulties in statistics that are common to all the agencies as well as those areas where there was still a need for improvement in data collection. One of the items related to ICCAT's activities was the responsibility for collecting high seas fishery statistics, by which the ICCAT current system appeared to provide satisfactory information. However, it was noted that 5° and 5° areas, in which most of the ICCAT high seas statistics are collected, might present some difficulties in dividing catches between high seas and EEZ. The CWP appreciated ICCAT's efforts to eliminate the differences in statistics between the ICCAT data base and the FAO tuna data base. The deliberate or unintentional mis-reporting or under-reporting of catches was also a subject of discussion. The CWP decided to abandon further efforts to compile tuna fleet statistics. ICCAT agreed to provide ICES with total catches and Task II catch data, so that they can report tuna catches according to their areas. The CWP recommended changing its name from the "Coordinating Working Party on Atlantic Fisheries Statistics" to the "Coordinating Working Party on Fisheries Statistics", so that world regional agencies can participate in its work. The ICCAT extended an invitation to hold the next CWP session, scheduled for 1994, in Madrid, pending approval by the Commission.

-- *Second Billfish Workshop (Miami, Florida, U.S.A. - July, 1992)*

The Report of the Second Billfish Workshop (COM-SCRS/92/16) was presented by the Convener of the meeting, Dr. E. Prince. The meeting was held at the NMFS Southeast Fisheries Center in Miami, at the invitation of the U.S. Government. Scientists from 16 countries attended the Workshop.

The Workshop reviewed genetic studies, including species identification, and found that progress was satisfactory. In reviewing historical statistics, a few new data series were reported for some recreational fisheries. Tagging activities were reviewed and it was found that these activities have been increasing in recent years quite satisfactorily. The comparison of Task I catches with Task II data in the ICCAT data base made it possible to separate sailfish catches into east and west Atlantic. At the same time, some standardizations of effort were successfully carried out and a non-equilibrium production model was applied to blue marlin, under the hypothesis of two stocks, north and south.

The Workshop noted the marked progress made in the last five years, under the auspices of the Enhanced Billfish Research Program, and several priority items were identified. The Workshop reiterated that billfish research is part of ICCAT's regular responsibility. The Workshop also proposed that the report and the

contribution papers presented be published in a more enhanced publication form, such as was done for the Yellowfin Year Program Report.

-- *Second GFCM/ICCAT Joint Consultation on Large Pelagic Fish in the Mediterranean Sea (Crete, Greece - September, 1992)*

The Assistant Executive Secretary presented the report of the Second GFCM/ICCAT Joint Consultation (COM-SCRS/92/17). The holding of a second joint consultation meeting was proposed by ICCAT at its 1991 meeting. Consequently, the Secretariat organized this Consultation jointly with the GFCM Secretary (FAO). Finally, through funding by the EEC, the Institute of Marine Biology in Crete, Greece, hosted the Consultation, which was held in September, 1992, immediately prior to the ICCAT swordfish stock assessment.

The majority of the tuna fishing nations in the Mediterranean area were represented at the Consultation and most of the catch statistics were updated to 1992. The historical data base was also reviewed and some serious errors were found and corrected. (The reported catches in round weight were found to be indeed gilled and gutted weight.) A few sets of new nominal catch and effort data series became available and some sets of biological data were also made available. The swordfish catch-at-size base was created during the Consultation and was presented at the 1992 Swordfish Stock Assessment Session.

Many new sets of bluefin data obtained during the Consultation were also used by the ICCAT East Atlantic Bluefin Stock Assessment Session. In general, the Consultation was very useful in improving our knowledge on the Mediterranean fisheries and in collecting better data.

The Consultation proposed establishing an Ad Hoc Working Group consisting of members of both organizations to collaborate in research and to exchange statistical and scientific information.

The Committee reviewed all the reports of 1992 inter-sessional meetings and approved them, with the understanding that a more detailed review of each would be made under the pertinent species sections and by the Sub-Committee on Statistics.

8. Report of the Results of the CITES Conference (Kyoto, Japan - March, 1992)

The Executive Secretary presented document COM-SCRS/92/14, regarding the proposal made by the Government of Sweden to include Atlantic bluefin tuna in the Appendices of the Conference on International Trade in Endangered Species of Wild Flora and Fauna (CITES). The Commission was represented at the Conference, held in Kyoto, by Mr. D. Silvestre (on behalf of the Commission Chairman, Dr. A. Ribeiro Lima) and by Mr. J. S. Beckett (member of the Canadian Delegation to CITES). The ICCAT scientists prepared a detailed response to the Swedish proposal that was sent to the CITES Secretariat well in advance of the Conference. At the same time, the Secretariat prepared two pamphlets, one explaining the Commission's scientific standpoint on this issue and another summarizing the Commission's activities. At the Conference, the Swedish Government withdrew its proposal, with the condition that the ICCAT continue to improve statistics and research on this species, and that all the nations fishing bluefin collaborate in the management of the stocks. Sweden also requested that CITES be informed of the results of ICCAT's scientific findings. The next Conference of CITES will be held in 1994 in the United States.

The SCRS Chairman stressed the importance of the Committee's scientific work and the need to present a well-balanced report on its findings which, in the future, will be much more critically reviewed by world scientists who may not be specialists in tuna research.

9. Review of the Progress Made by the Albacore Research Program

A report on the progress of the Albacore Research Program (COM-SCRS/92/11) was presented by the Program Coordinator, Dr. F. X Bard (Côte d'Ivoire). He explained that the Program had been proposed due to the rapid change in the albacore fishery and to improve our knowledge on the biology of albacore. Research carried out in 1990 through 1992 under this Program produced reliable information on albacore reproduction, and an analysis of 1989 data, based on substantial at-sea sampling in that year. Also, intensified tagging has been carried out in the last few

years. The aging technique has progressed and the MULTIFAN software was used to convert catch at size to catch at age. Using the catch-at-age thus obtained, tuned VPA was used for the first time for albacore.

In order to conclude the Program, the Coordinator proposed holding an Albacore Workshop in 1994.

The Committee approved the Report and the recommendations, with the understanding that the proposal of holding an Albacore Workshop in 1994 be further discussed under Agenda Item 18, "Review of Future SCRS Activities". The Report is attached as Appendix 11 to Annex 14.

10. Review of the Progress Made by the Program of Enhanced Research for Billfish

Document COM-SCRS/92/12, concerning the Secretariat's coordination of the Billfish Program, was presented to the Committee. It was noted that this Program has been supported by private funding, that research had been carried out according to the Program Plan throughout 1992, and that most of the Plan had been accomplished. The 1992 Billfish Workshop was the highlight of the research activities carried out in the last four years.

A substantial improvement has been noted in billfish data. Information on the income and expenditures of the Billfish Trust Fund in 1992 was attached to the Report. The Fund was used to finance the participation of many scientists at the Workshop. The results of several research activities financed by this Fund were reported in various 1992 SCRS papers.

The west Atlantic Coordinator's plan to visit west African ports to improve the statistical system in that area has not yet been realized. In response to an inquiry from the Committee as to the reasons why this had not been carried out, the west Atlantic Coordinator replied that the Workshop preparations took up so much of his time and also because funds were relatively limited.

The Report was reviewed and adopted and is attached as Appendix 12 to Annex 14.

11. Review of the Progress Made by the Bluefin Year Program

The Bluefin Year Program (BYP) was approved at the 1991 Commission meeting. Mr. B. Liorzou (France), presented the report on the progress of the Program (COM-SCRS/92/13). There was no financing authorized by the Commission for this Program and hence voluntary contributions (in terms of money and research) were solicited. Mr. Z. Suzuki (Japan) was nominated as General Coordinator of the Program and Mr. Liorzou was named Co-coordinator for the eastern stock. Up to now, the U.S., France, Canada, Spain and Japan have reported on their research conducted in 1992 within the framework of this Program, the results of which were reported in several papers presented at this Session. These papers are relative to the fundamental biology of bluefin (stock structure, reproduction biology, abundance indices, etc.) for the west as well as for the east Atlantic.

Mr. Liorzou also reported that the BYP was discussed during the Second GFCM/ICCAT Joint Consultation on Large Pelagic Fish in the Mediterranean Sea, and that many GFCM members who are not ICCAT members showed considerable interest in the Program. Many subjects covered by the BYP complement a program that is currently being carried out by the EEC in the Mediterranean area. Dr. J. L. Cort and Dr. Z. Suzuki were nominated as Project Leaders for the reproduction and growth studies on bluefin tuna for the east and west stocks, respectively.

The SCRS Chairman added that the Second Consultation also served to establish collaboration between the ICCAT BYP and the EEC Program. Since the ICCAT Program does not have any funding by the Commission, it is important that we take advantage of this currently on-going EEC Program.

The Co-Coordinator commented the intention to designate 1994 as the "Bluefin Year".

The Committee approved the Report, which is attached as Appendix 9 to Annex 14.

12. Review of the Conditions of Stocks

YFT - YELLOWFIN

YFT-1. Description of Fisheries

Yellowfin is fished in the entire tropical Atlantic between 45°N and 40°S by surface gears (purse seine, baitboat and handline) and by longline.

The baitboat fisheries target juvenile yellowfin which are associated, in mixed schools, with skipjack, juvenile bigeye and small tunas in the east Atlantic, and with skipjack and small tunas in the west Atlantic. On both sides of the Atlantic, the baitboat fisheries have been exploiting yellowfin tuna in coastal areas (YFT-Figure 1). The average weight of the individuals caught by this gear is around 5 kg., with sizes ranging between 30 and 130 cm for the east and 40 and 125 cm for the west.

In the east Atlantic, purse seine fisheries have developed rapidly since the mid-1970's, basically targeting large yellowfin in spawning concentrations of the Equatorial areas during the first quarter of the year, and targeting small yellowfin that are caught in mixed schools in the same areas as the baitboats (YFT-Figure 2). The size ranges caught show a bimodal distribution with the modes defined at 50 and 155 cm, slight representation of intermediate sizes (70-100 cm) and the presence of large sizes (> 160 cm). The purse seine fisheries of the west Atlantic, with some exceptions, have developed in the coastal areas due to the lesser power of the vessels of the fleets using purse seine. The sizes caught show a smaller range than in the eastern Atlantic (40-140 cm) with a greater representation of intermediate sizes.

In 1991, the main purse seine fleets in the east Atlantic (France and Spain) developed fishing with floating objects. This has been a traditional type of purse seine fishing that has been increasing with the placing of buoyed artificial objects. This type of fishing obtains greater catches during the last quarter of the year. In this period, 55 percent of the yellowfin catches are caught in association with floating objects, compared to 15 percent, which is approximately the average percentage of the catches with floating objects for previous years. The species and size composition of the schools associated with floating objects remains very constant, although, as the fishing area is located more in the high seas, small yellowfin, bigeye, skipjack and small tunas are caught together with large yellowfin in a greater proportion than when fishing in association with natural objects.

The longline fisheries operate in a wide area between 15°N and 10°S, continuous throughout the entire Atlantic (YFT-Figure 3). This is the fishing area of the main fleets that use deep longline targeting bigeye. At present, with the change in target species to bigeye and the almost withdrawal of the Cuban, Panamanian, Taiwanese and Korean fleets, the importance of these fisheries has been reduced considerably. The catches by these fleets are comprised of large individuals with an average weight over 40 kg. On the western side, local longline fisheries have developed on a more local level, such as the Brazilian fisheries of the southwestern Atlantic, which catch significant amounts of this species, even though the specific target is not yellowfin, or the United States surface longline fishery in the Gulf of Mexico.

YFT-1.a Catches

YFT-Table 1 and YFT-Figures 4, 5, and 6, show the trends in yellowfin catches by gear for the east, west and total Atlantic, for the period 1961-1991.

In the last year, the total catch has declined slightly, after the historic record catch of 1990. This reduction is a consequence of the considerable decrease (16 percent) in east Atlantic catches in 1991. For this part of the Atlantic, the 1991 catches broke the increasing trend which began in 1988 and has continued due to the high catches of adult yellowfin by the purse seine fleets during the first quarters of 1989 and 1990. The baitboat catches remain stable at the same level as the last few years. Longline catches, which made up the main component of the catches at the beginning of the fishery, remain at a low level of the recent period (less than 5 percent of the total catch), while there is a clear predominance of purse seine catches representing more than 80 percent of the total eastern Atlantic catch.

In recent years there has been an important increase in purse seine catches of "NEI" (nowhere else included), which is the category that includes vessels that fly flags of convenience. The 1991 catches of this fleet make up almost 15 percent of the total purse seine catch.

For the western Atlantic, two well defined period are observed: one prior to the development of the surface fisheries (especially purse seine) which goes to

the end of the 1970's with catches of about 13,000 MT; and a second period of the last nine years with catches close to 30,000 MT (YFT-Figure 5). During this second period, the catches have remained stable with small fluctuations due to the movement of the surface fleets between the Atlantic and Pacific Oceans.

YFT-1.b Effort

YFT-Table 2 and YFT-Figure 7 show the changes in nominal effort of the east Atlantic surface fleets for the 1972-1991 period.

The change in fishing effort is independent and very different for the two types of fishing. The baitboat fishery has maintained a very similar effort level throughout the series. On the other hand, purse seine effort increased continuously until 1984, when the low yields obtained on the large yellowfin caused a drastic reduction in effort in 1985 which continued, although to a lesser degree, during the subsequent years, due to the massive movement of vessels of the FIS (French, Ivorian and Senegalese) and Spanish fleets to the Indian Ocean. In recent years, a slow return of these fleets to the Atlantic has been occurring, with the ensuing increase in nominal effort.

However, in this fishery in particular, the change in nominal effort is not very indicative of the real effort which, in terms of fishing mortality, is exerted on the stock. Considerable data from the fishery (decrease in searching time, lesser proportion of null sets, greater size of the sets, etc.) show that the technical improvements introduced in the fleets as well as increasing knowledge of the fishery by the captains are resulting in an increase in the fishing power of the purse seiners. This situation was supposedly real although no methods had been developed to evaluate the importance of the change until this year. A method was proposed to analyze the changes in the fishing efficiency of the fleets, based on the catchabilities estimated after "calibrating" the VPA with nominal effort data. Applied to the purse seine data, the method indicates a significant increase in effective effort that is being exerted on this stock.

As regards the west Atlantic, the Data Preparatory Meeting for Southwest Atlantic fisheries produced important advances in the availability of and improvements in the data from these fisheries. YFT-Figure 8 shows the change in effort of the Brazilian longline and baitboat fisheries from 1979 to 1991. Longline effort increased continually until 1983, declined during the following years, and then increased considerably in 1986 and subsequent years. In 1991, effort declined to the 1983 level. As regards the baitboats, an increasing trend was observed until the high level of 1983, which were maintained until 1985 and then decreased in 1986 and have been maintained in the recent period.

Surface fishing effort for the Venezuela area has increased in the last year with the incorporation of new purse seiners.

As concerns longliners, U.S. fishing effort in the Gulf of Mexico has decreased slightly in 1991, while Japanese effort has maintained its increasing trend of recent years, concentrated in the southern area of the fishery.

YFT-2. State of the Stocks

The hypothesis of two independent stocks of yellowfin, in the east and west Atlantic, has been widely adopted by the Committee as a basis of the assessments. However, in recent years, there have been several indices presented that question this hypothesis. In 1991, there were eight reports of transatlantic recoveries of large yellowfin tagged off the east coast of the United States and recovered in the eastern Atlantic near the Equatorial area. These recoveries, together with the 17 recoveries reported previously, support the stock structure hypothesis that was proposed during the Yellowfin Year Program and further examined and expanded at the last SCRS Meeting.

However, although at the 1992 SCRS Meeting an analytical assessment of Atlantic yellowfin under a single migratory stock with two geographic components (east and west) was presented, this year only assessments of the so-called east Atlantic stock have been presented.

YFT-2.a East Atlantic stock

YFT-2.a.1 Production model

The generalized production model PRODFIT was fitted for m=2 (Schaefer model), m=1 (exponential model) and estimated m and a value of k=4. The model was applied to the period 1969-1991. Three different effort series were considered:

1) Effective effort estimated in the traditional manner from the annual catches and the abundance indices combined for FIS and Spanish purse seiners.

2) Nominal effort, in fishing time, standardized for FIS purse seiners in category 5. The total effort was obtained by multiplying the sum of the fishing times, standardized for the two main purse seine fleets, by a weighting factor equal to the ratio between the total catch and the catch by these fleets.

3) From the previous series, considering a constant 3 percent increase in fishing power of these fleets from one year to another. This increase would be justified by the numerous data that are received in this sense from the fishery and which this year have been put in a model whose results were presented to the Committee.

YFT-Table 3 shows the data used for the fit.

YFT-Table 4 shows the results obtained. In all the trials, the estimated maximum sustainable yields are similar to, and consistent with, previous results; in all cases the catches of the last three years are above the MSY. On the other hand, the current effort, in relation to the optimum effort, varies widely according to the effort series considered. With the first effort series, the situation is one of low exploitation, whereas it is close to full exploitation if the last series is considered. The Committee decided that this last, more pessimistic, situation should be the one that comes closest to the real situation. The choice of this solution is supported by:

1) The changes that have occurred in effective effort, as a result of the increase in fishing power of the purse seiners, are not taken into account in calculating the abundance indices. Hence, these indices would over-estimate the abundance and under-estimate the effective effort exerted on this stock.

2) The high indices corresponding to 1989 and 1990 may indicate significant increases in the biomass of the stock, or rather an increase in the catchability of yellowfin in those years. Analyzing the catch per unit of effort of large yellowfin (YFT-Figure 9), it can be seen that the high values of the indices are due to the extraordinary yields obtained during the first quarter of those years on the adult stock. The size distributions in the catches for those years (YFT-Figure 10) would lead to the same conclusion. In comparing different abundance indices of the adult stock (YFT-Table 5), it can be observed that the high values of the indices in 1989 and 1990, estimated from purse seine data, in no way correspond to those estimated from longline data. The Honma longline index for 1989 has a normal value compared to the high value of the purse seine CPUE. This fact would lead to seeking the cause of the high values of the purse seine indices in factors other than abundance, and that could be related to environmental factors. The availability of yellowfin to purse seines is clearly related to the position and definition of the thermocline. YFT-Table 6 shows the temperature range at 70 m (depth at which the purse seine is closed) in the Equatorial area for the most recent years. In 1989 and 1990 the thermocline is not very deep and is clearly defined, which undoubtedly contrasts with the situation in 1984. In that year, an obvious decrease in the catchability of yellowfin to purse seine was observed. It can be said that the high values of the indices of abundance in 1989 and 1990 are probably not representative of the biomass of the stock in those years, but instead show increases in the catchability of large yellowfin by purse seine and that, therefore, the effective effort for those years would be clearly under-estimated.

From the last fit of the production model (YFT-Figure 11) it can be concluded that the stock is close to full exploitation. In this situation, any increase in effort will not result in sustained increases in catches.

YFT-2.a.2 Non-Equilibrium Production Model

An additional model of yellowfin was estimated, using the ASPIC non-equilibrium production model. The model was fit to the data in YFT-Table 3, using effort series 3.

Although a model using effort series 2 (YFT-Table 3) was also fit, the present model was considered more realistic, as it appeared to be in better agreement with the data and with the known information about fishing power. The following details are similar to those concerning the PRODFIT models:

This model fits the data much better (R^2 = 79 percent) than the model of series 2 (R^2 = 60 percent). (Both models were fit by minimizing errors in estimated effort, thus assuming that reported catches are more precise than calculated effort.)

The better fit was given an approximate statistical test to determine whether it might have occurred by chance. The F-statistic is significant at $P < 0.03$. It was concluded that the better fit was very unlikely to be from chance.

The pattern of residuals of model of series 2 exhibited a series of negative residuals for the last six years, indicating that those catches were higher than expected. The residual pattern of the final model did not exhibit this pattern and was much more random, which suggests better agreement of the model structure with the observed data.

At the 1991 SCRS meeting, an estimate was made of increase in catchability in recent years, under a simple model in which a separate catchability coefficient was estimated for the years following 1987 (to correspond with the wide usage of bird radar). In that analysis, the catchability was estimated to have increased by about 40 percent (see YFT-Figure 12 of the SCRS Report in the Biennial Report of 1990-1991, Part II).

From our knowledge of fishing techniques, it is believed that an increase in catchability would be expected due to improvement in fishing methods. These improvements include the use of bird radar, massive placement of artificial floating objects, etc..

For those reasons, the model of series 3 is presented here. The model fit (YFT-Figure 12) was able to follow much of the variability in observed fishing effort. YFT-Figure 13 shows relative biomass to the optimum biomass, and YFT-Figure 14 shows fishing mortality rate relative to the F corresponding to B_{MSY}. The estimated biomass has been divided by the estimated optimum biomass B_{MSY}. This provides a more precise result and expresses the results in relative terms. It is estimated (YFT-Figure 13) that the stock biomass has been decreasing since the start of 1989. The stock biomass at the start of 1992 appears to be at about 80 percent of its optimum level and to be at about the same level as in the start of 1984.

The estimate of MSY from this model is 115,000 MT, which is less than the recorded catches in 1989, 1990 and 1991. An approximate non-parametric 80 percent confidence interval on MSY is 112,000 MT to 120,000 MT (YFT-Figure 15). The estimated optimum effort rate is around 40,800 nominal effort units (the same type of units as in the PRODFIT analysis), which is about 10 percent lower than the 1991 effort rate (YFT-Table 3), and about 20 percent lower than effort estimated by the model in 1990 and 1991. The estimated 80 percent confidence interval on optimum effort is around 38,000 units to 44,000 units (YFT-Figure 15). Thus this model estimates that effort and recent catches have exceeded the optimum levels.

There is evidence that yellowfin catchability is affected not only by changes in fishing practices, but also by oceanographic conditions. It remains to be seen how models of such processes might be combined with stock-assessment models (such as production models), although in theory it would not be difficult to do so. It is also not clear how the present results might be changed by including the results of oceanographic variability. If the oceanographic variability is random (which seems a reasonable assumption), then the results from ASPIC should be unbiased. However, including oceanographic variability should increase the precision of the estimates, and that might mean a revision of the current assessment conclusions towards a more optimistic or more pessimistic state.

YFT-2.a.3 Virtual Population Analysis (VPA)

A VPA fitted for the different levels of recruitment was applied, on a quarterly basis, as is usually done for this species. Up to now, no yellowfin assessment has been carried out using integrated methods of calibration, such as ADAPT. The application of these methods on yellowfin presents some problems. First of all, these programs are developed for working on a yearly base, and not by quarters, as is advisable for this species which has markedly seasonal fishing and few age classes present in the catches. Secondly, there are reasonable doubts about the validity of the indices of abundance that are necessary for the calibration, since changes in oceanographic conditions could be interpreted as changes in abundance.

The results of the VPA (YFT-Table 7) show that fishing mortalities on juveniles and pre-adults, and biomass values, are maintained at the level of recent years, and that fishing mortalities on adults have been high in the recent period. The estimated biomasses do not show high values for the years of high yields (1989 and 1990). No yield per recruit was estimated for this stock.

YFT-3. Effects of Current Regulations

The adoption, in 1973, of a minimum size regulation of 3.2 kg for yellowfin does not appear to have caused a reduction in fishing mortality on juveniles.

YFT-4. Recommendations

YFT-4.a Statistics

i) In 1991, the main purse seine fleets that operate in the eastern Atlantic have directed the major part of their effort on fishing with floating objects. The statistical problems that this new situation generates and their possible solutions are included in a general recommendation of the tropical species group, which is attached as Appendix 6 to Annex 14.

ii) In 1991, the volume of catches from the so-called NEI fleet increased considerably and the information available indicates that the increase will continue. It is absolutely essential that information from the vessels that change flag not be lost. Therefore, it is recommended that the Secretariat and the scientists responsible for these fisheries make a joint effort to continue obtaining the statistics of these vessels, in accordance with the norms of the SCRS.

iii) The system of existing currents in the southeast Atlantic could constitute an oceanographic barrier between the Atlantic and Indian Ocean stocks. Therefore, it is recommended that the eastern Atlantic catches taken in latitudes below 20°S, be monitored carefully, since they can possibly pertain to the Indian Ocean stock.

iv) Catches from the Japanese longline fleet are provided in number of fish, rather than in weight. There is some information to the effect that the fish are weighed on board. Therefore, the group recommended that Japan provide such information to ICCAT, if it is available.

YFT-4.b Research

i) The Working Group on Western Atlantic Tropical Tunas, and the Data Preparatory Meeting on the data base of the southwestern Atlantic have resulted in a significant improvement in the availability and processing of data from fisheries in that part of the Atlantic. With the current situation, all the problems related to the stock structure of Atlantic yellowfin tuna can now be studied. For this, the formation of a Working Group to evaluate the Atlantic yellowfin tuna is recommended. This group will have a double objective: (1) to broaden our knowledge on the state of the stock in the western Atlantic; and (2) to assess the overall status of the stock, east Atlantic and west Atlantic, from models that, for example, permit the incorporation of migratory components. It is recommended that the group maintain contact with the FAO's permanent network TUNET of Working Groups for Studying Interactions of Pacific Tuna Fisheries.

ii) The numerous transatlantic recoveries reported in recent year have provided invaluable information on the structure of the adult stock. This information could be expanded if the tagging programs are expanded to other areas of the eastern Atlantic. Therefore, it is recommended that the scientists responsible for the southwestern Atlantic fisheries develop tagging programs for large yellowfin. It was also recommended that catches be analyzed quantitatively.

iii) An interesting method was presented to analyze the changes in fishing efficiency of purse seiners in the eastern Atlantic, although the estimates of the changes should be considered preliminary. It is recommended that the studies continue on the different factors that could influence this change (environmental causes, improved fishing techniques, etc.) so as to arrive at a better understanding of the change.

iv) A study was presented that analyzes the stock structure through meristic studies, however the data used for the eastern Atlantic were obsolete. Given the low cost of this type of study, it is recommended that a joint, multi-year program be developed for the entire Atlantic.

v) The group reiterated the recommendation made by the Data Preparatory Meeting on the Southwestern Atlantic to improve the current size-weight relations for western Atlantic yellowfin tuna.

YFT-4.c Management

The two production models (PRODFIT and ASPIC) which were fitted to the eastern Atlantic catch and

effort data show a status of the stock close to or slightly above full exploitation. According to both models, the 1991 catch would be more than 117,000 MT, the estimated MSY according to the PRODFIT model, and 115,000 MT, the estimated MSY according to the ASPIC model. Effort would be very close to, in the case of the PRODFIT model, or higher than, in the case of the ASPIC model, the effort corresponding to MSY. the ASPIC model shows a state of the biomass, at the beginning of 1992, at the 1984 level (approximately 80% of the biomass corresponding to the MSY).

In this situation, sustained increases in effort should not correspond to sustained increases in the catches, which could only be expected to increase if, as happened in 1989 and 1990, there are favorable oceanographic conditions that increase the catchability of yellowfin. Up to now, the only changes detected refer to the accessibility of large yellowfin to the purse seine.

Therefore, it is recommended that the current level of effort on eastern Atlantic yellowfin not be increased.

As regards the exploitation of the stock, the results of the virtual population analysis do not show changes in fishing mortality on juveniles. Therefore, it can be considered that the conclusions of earlier analyses of yield per recruit, on size at first capture, are still valid at present.

BET - B I G E Y E T U N A

BET-1.Description of fisheries

Bigeye tuna are widely distributed in the tropical and temperate waters of the Atlantic Ocean, between approximately 45°N and 45°S. The presence of juveniles is only observed in the Gulf of Guinea, the only presently known nursery.

The stock is exploited in the entire area of distribution by different fleets and fishing gears: longline, purse seine and live bait.

The main bigeye fishery is the longline fishery which operates during the whole year in the entire area of distribution. The longline fishery exploits adult bigeye tuna (weighing about 40 kg). Since 1980, the Japanese and Korean longliners directly target bigeye tuna using deep longlines and concentrate their effort in the time-area strata where the density of bigeye tuna is higher. From 1990, Taiwanese longliners began targeting bigeye tuna, especially in the south Atlantic, using deep longlines.

Of the surface fisheries, many local baitboat fleets seasonally target bigeye in the areas of the Azores, Madeira and Canary Islands. These fisheries of the northeastern Atlantic islands exploit mainly pre-adult or adult bigeye tuna (average weight of approximately 30 kg).

The Dakar-based baitboats, which fish off Senegal and Mauritania, seasonally catch medium-sized pre-adult bigeye. The mean weight observed for bigeye taken by the Dakar-based baitboats in 1991 was 10 kg.

In the eastern tropical Atlantic, the purse seine and baitboat fleets take juvenile bigeye (mean weight of approximately 5.5 kg for the purse seiners and 2.5 kg for the Tema-based baitboats) which form mixed schools with skipjack and young yellowfin. These last two fisheries do not directly target bigeye, but each year take significant amounts of juveniles, especially in terms of number of fish.

Since 1990, the increasing use of artificial floating objects has been observed in the tropical surface fisheries. The change in fishing strategy of these fleets due to the use of aggregating devices has caused an increase in the catch of juvenile bigeye tuna, simultaneously with the expansion of the purse seine fishing area towards the west to latitudes near the equator, following the drift of the floating objects.

BET-1.a Catches

The annual catches of bigeye tuna, from 1962 to 1991, by country and fishing gear, are given in BET-Table 1, and the total catch, by gear, from 1950 to 1991 is shown in BET-Figure 1.

BET-Figure 2 shows the areas of operation and the size ranges characteristic of each gear; BET-Figure 3 shows the changes in annual catches of these gears for 1975-1991.

The total catch in the Atlantic increased regularly to 63,600 MT in 1974 and then showed a declining trend until 1979 (45,100 MT). In the following years, the catches gradually increased, reaching a maximum of 74,400 MT in 1985. They then decreased to 48,700 MT in 1987, and increased in the following years and are currently at a level of 69,500 MT (1991, preliminary).

The decrease in catches observed in the period 1986-1988 is mainly due to a decrease in the longline catch, but a decrease was also observed for the surface gears.

The between-year variability observed in the catches of bigeye tuna is mainly a result of the longline operation whose catches have represented 60 to 70 percent of the total up to 1990. This predominance of the longline in the bigeye catches has been the case since the beginning of this fishery in the Atlantic Ocean as well as in other oceans. The preliminary data for 1991 show a 26 percent decrease in the longline catches, which only represent 47 percent of the bigeye catch during this year.

The strong between-year variability observed in the Portuguese and Canary Island catches is most probably linked to the variations in the local hydrological conditions.

Regarding surface gears, the catches showed a decreasing trend from 1987 to 1989, but then increased during the following years. The catch for 1991 (36,700 MT), is the highest recorded for the history of the fishery. This reflects the continuous increase observed in the baitboat catches since 1989, and especially in the purse seine catches, which reached a record high of 21,100 MT in 1991, and which corresponds to 30 percent of the total catch.

BET-1.b Effort

The decline in the longline catches observed in 1986 and 1987 was caused by the decrease in the number of Japanese and Korean longliners in the Atlantic during this period. This situation has reversed since 1988 and, in 1991, the number of Japanese longliners that operated in the Atlantic was the highest of the last six years. In contrast, the number of Korean longliners has continued to decrease in recent years.

Fishing effort of FIS baitboats based in Dakar continued to decline in recent years. In the baitboat fisheries of the Azores and Madeira, fishing effort continued to increase in the last few years.

The decrease in purse seine catches, observed in the recent period, is due to the decrease in effort which occurred after 1984, following the departure of part of the purse seine fleet to the Indian Ocean. Since 1990, the number of purse seiners in the Atlantic has increased, which resulted in an increase in nominal effort and in their catches, that have also increased in comparison to previous years.

In the southwest Atlantic, there has been an increase in the last three years in the effort of the longliners operating off Brazil.

BET-2. State of the Stocks

The state of the bigeye stock was analyzed using the hypothesis of a single stock in the entire Atlantic. A single bigeye stock remains the most likely hypothesis in view of the fisheries data, the geographic distribution of the species, the tagging results, the location of the spawning areas known in the tropical area between 15°N and 15°S and in view of the fact that the only nursery known for young bigeye is found in the Gulf of Guinea.

The only abundance indices used for the bigeye stock are those calculated from the catch rates of the longline fishery, which directly targets bigeye tuna in the entire Atlantic. In fact, since the surface fisheries only catch bigeye seasonally or incidentally, and since they only catch certain sizes, their CPUE indices are not considered representative of the total stock abundance.

The CPUE of the seasonal fisheries of the northeastern Atlantic islands reflects the local abundance of a fraction of the stock, and is subject to variations caused by local hydrological conditions. This situation is illustrated in BET-Figure 4, which shows the changes in CPUE of Azorean baitboats from 1979 to 1991, during the second quarter, when this species is fished. The CPUE shows a declining trend in recent years. The strong influence of the hydrological conditions on this fishery indicates that this trend may not correspond to the adult stock abundance.

As concerns the FIS baitboat fishery, its CPUE, although seasonal, is less influenced by environmental changes (BET-Figure 5). The increase observed in CPUE from 1984 is related, in part, to a change in the fishing strategy and to an increase in the efficiency of the fleet.

The CPUE of the purse seiners, which can be interpreted as an abundance index for juvenile bigeye, shows no marked trends in recent years. The CPUE of the FIS purse seiners also shows fluctuations, without trends, for the 1969-1991 period (BET-Figure 6), although a slight increase was observed in the last two years.

In the southwest Atlantic, a decrease in the bigeye CPUE is observed for the longliners fishing off Brazil.

Adult stock abundance, calculated from the Japanese longline CPUE (the Honma index with adjustment for the use of deep longline) continues to show relative stability in recent years, with a slightly increasing trend, compared to the period before the introduction of deep longline. However, this increasing trend could be explained by the introduction of bias when adjusting the effort for the deep longline to that of the traditional longline.

The current abundance index, calculated from the average longline CPUE for the 1984-1990 period, represents 80 percent of the CPUE calculated for the initial phase of the fishery (1961-1965); this can be interpreted as an indication of a low exploitation rate (BET-Figure 7).

The mean fishing mortality rates according to age, estimated by cohort analyses for the period 1980-1989, indicate that in recent years fishing mortality is at a relatively high level for the young fish (ages 1 and 2) due to the tropical surface gears. For adults fish, ages 4 and over, fishing mortality is also relatively high compared to the historical period, especially for the longline fishery.

Fishing mortality observed in 1990 is at the average of the 1980-1989 period (BET-Figure 8). However, fishing mortality on juveniles is higher than that observed for the reference period.

For the first two years, a very high natural mortality varying with age for juveniles (M = 0.8) and for the following years a very low mortality (M = 0.4) was assumed for the cohort analyses.

The yield-per-recruit analysis for bigeye indicates that, with the current exploitation scheme, yield could increase significantly by increasing fishing mortality. In contrast, a modification in the age at first capture would have no effect on the yield per recruit, unless it was accompanied by an increase in fishing mortality (BET-Figure 9).

The multi-gear yield-per-recruit analysis suggests that with the current exploitation scheme the most significant gains by an increase in fishing mortality on adult bigeye tuna would be discounted by a simultaneous decrease in mortality on juveniles (BET-Figure 10). In contrast, in the case of an increase in fishing mortality on juveniles, the gains to be expected in yield per recruit would only be marginal. This was the case in 1991, but it was not taken into account in the current analysis, which only uses data up to 1990.

An updated production model analysis (PRODFIT), adjusted for the 1961-1990 data, indicates MSY values from 67,500 MT (m = 2) to 76,100 MT (m = 1). This analysis suggests that the current catches, in 1990, are at the level of the MSY (BET-Figure 11).

The production model analysis also indicates that fishing effort on bigeye tuna is at a level below the optimal fishing effort (F_{opt}) estimated by the model to reach MSY; this was always the case in previous analyses with this model.

Two fittings of the ASPIC non-equilibrium production model were also made on the data on bigeye tuna. Model 1 assumed that catchability was constant over the entire time series, 1961-1990. Model 2 assumed that catchability was constant during each of two time periods, 1961-1984 and 1985-1991, but might have changed between periods, because fishermen have improved the longline gear used to target bigeye. This division of time was chosen because 1985 was the first year when the "deep longline 2" (12-15 branch lines) was used more than the "deep longline 1" (8-11 branch lines) by Japanese vessels. Model 2 was used to test whether the increase in catchability assumed to result from that change could be demonstrated mathematically.

The results of the analysis (BET-Table 2) support the hypothesis of increased catchability in recent years. The estimated increase in catchability was about 50 percent (BET-Table 2). This change, of course, is an increase in fishing power.

Once the scenario of increased catchability (Model 2) is accepted, a less optimistic assessment of the state of the stock is reached (BET-Table 2). Recent catches, specifically in 1989 and 1990, appear to have been larger than MSY. Also, the stock biomass at the start of 1991 is estimated to have been slightly below the optimum level, and the fishing mortality rate in 1990 appears to be about 15 percent in excess of the optimum (BET-Figures 12 and 13).

BET-3. Effects of Current Regulations

The bigeye minimum-size regulation of 3.2 kg has been in effect since 1980. It was adopted to reinforce the yellowfin regulation. It has been reported in recent years that the tropical surface fleets (baitboat and purse seine) continue to land a large number of juvenile bigeye tuna.

Under the present conditions, the analyses indicate that the size regulation of 3.2 kg would not provide any possible gains in yield per recruit for bigeye tuna. Nevertheless, since the effort of the tropical surface fleet is increasing and using artificial floating objects increased the catch of juveniles to record amounts, the current regulation has been useful in improving the yield per recruit of the stock.

BET-4. Recommendations

A series of recommendations which also concern bigeye tuna are presented in the yellowfin and skipjack sections, and in Appendix 6 to this Report. The Committee also recommended that:

BET-4.a Statistics

i) The increasing use of deep longline by the longline fleets poses a problem for the processing of the longline data. So that the effort data can be standardized, it is recommended that all the countries which fish with longlines send to ICCAT detailed information, by 5°/month, on the proportion of deep longlines in operation.

ii) Evaluate the species composition and the volume of bigeye catches in the landings in African ports.

BET-4.b Research

i) An abundance index be generated that encompasses information on the bigeye surface fisheries. This should include analyses on the apparent variability of recruitment based on the CPUE of age-classes 1 and 2 from FIS and Spanish purse seiners in the coastal areas, and on the CPUE by size class and by limited time-area strata, for purse seiners as well as for longliners.

ii) Research on changes in gear efficiency between traditional and deep longline operations be continued in order to calculate the effective effort exerted on bigeye tuna.

iii) Studies on the influence of the environment on bigeye CPUE be developed.

BET-4.c Management

According to the available assessment results, there are few potential benefits to changing the age at first capture, in the current situation. However, the Committee recommended maintaining the regulations currently in effect, taking into account a possible increase in purse seine effort and that the use of artificial floating objects increases the catch of juveniles. Thus, the current regulation is always useful for improving the yield per recruit of the stock.

SKJ - S K I P J A C K

SKJ-1. Description of fisheries

Skipjack tuna is a cosmopolitan species distributed in the tropical and sub-tropical waters of the three oceans.

Skipjack tuna are caught almost exclusively by surface gears in the entire Atlantic Ocean, although minor by-catches of skipjack are taken by longline. In the east Atlantic, the major fisheries are purse seine, especially the Spanish and FIS fleets, followed by the baitboat fisheries of Ghana, Portugal, Spain and the FIS fleet. This fishery underwent important changes in 1991: the introduction of floating objects and the expansion of the purse seine fishery towards the west, in latitudes close to the equator, following the drift of the objects. These changes have resulted in an increase of the exploitable biomass of the skipjack stock (due to the expansion of the fishing area), whereas the usual size distribution of the catches has been maintained. In the west Atlantic, the most important fishery is the baitboat fishery, comprised almost exclusively of Brazilian, Cuban and Venezuelan vessels. As regards the purse seine fisheries, whose overall catches are much less important that those of the baitboat fisheries, catches were only taken by the Venezuelan, Spanish (absent from this fishery since 1986) and the United States fleets.

SKJ-Figure 1, shows the size distributions of skipjack catches by the principal Atlantic fisheries.

SKJ-1.a Catches

Catches, by gear, in the east and west Atlantic are shown in SKJ-Table 1 and SKJ-Figures 2 and 3. In 1991, catches of this species in the Atlantic Ocean reached their highest level.

East Atlantic skipjack catches in 1991 are the highest for the historical period. This important increase is due almost entirely to the increase in the catches of the purse seine fleet (from 73,000 MT to 124,000 MT) (an increase of 70 percent), while baitboat catches were 19 percent higher than those of the previous year. The catches of the principal east Atlantic fisheries are shown in SKJ-Figure 4.

As regards the west Atlantic, there has been an overall increase in catches, due to the increase in purse seine catches, mainly by the Venezuelan and Spanish fleets. This represents a break in the decreasing trend that started in 1985 when the major part of the Venezuelan fleet shifted to the Pacific Ocean. Catches by the baitboat fleets have remained stable at about 20,000 MT since 1987. Catches by the principal fisheries of the west Atlantic are given in SKJ-Figure 5.

SKJ-1.b Fishing effort

As concerns fishing effort, there is no information available on effective skipjack effort. As in other years, vessel carrying capacity has been used as a measure of nominal effort for the east Atlantic (YFT-Table 2). Carrying capacity is not an ideal measure of effort, since it does not take into account the increase in fleet efficiency, fleet interaction, etc., since only the load capacity of the wells of the vessels was taken into account.

Nominal effort of the FIS and Spanish purse seine fleets was calculated, in days fishing, standardized to category 5 FIS purse seiners. The total effort was obtained by multiplying the sum of the standardized fishing times of the two main purse seine fleets, by an annual factor equal to the ratio between the total catch and the catch of these fleets. Besides, after 1980, an increase of 3 percent in the fishing power of these fleets, constant from one year to another, was taken into account. This factor, established in document SCRS/92/38 for yellowfin, attempts to adjust the nominal effort to real effort (fishing mortality), in order to adjust the continuous increase in the efficiency of the purse seiners.

SKJ-Figure 6 shows the change in total carrying capacity, and by fleets, for the eastern Atlantic. This figure also shows the change, since 1980, in nominal effort, in fishing days, calculated based on the purse seine fleets.

The maximum carrying capacity was reached in 1983 (81,800 MT), and since then there was slow decline until 1988 (43,900 MT), due to the massive movement of vessels of the FIS and Spanish purse seine fleets towards the Indian Ocean. Afterwards there were slight increases in 1989 and 1990, and an important increase in 1991 to 59,300 MT, which is 28 percent less than that of 1983.

Due to the lack of data on carrying capacity, estimates of total nominal effort for the west Atlantic could not be carried out, although there are indications that there has been a slight increase, due to the increase in the number of purse seiners and to the stability of effort of the Brazilian baitboat fleet.

SKJ-2. State of the Stocks

Up to now, studies carried out on skipjack stock structure in the Atlantic have not provided definitive information on the stock structure to make it possible to divide the resource into smaller units. Two management units have been established: one in the east Atlantic and one in west Atlantic, with slight mixing, judging by the absence of transatlantic recoveries of tagged fish (especially in the east).

SKJ-2.a East Atlantic stock

The last detailed skipjack stock assessment for the east Atlantic was carried out in 1984 by the Working Group on Juvenile Tropical Tunas. For these analyses, data and parameters obtained mainly during the International Skipjack Year Program were used. The results of this evaluation showed that the stock was under-exploited, just as the Group, and later the SCRS, had assumed.

In observing the change in vessel carrying capacity, it is noted that at the time of the assessment, the fishery supported the highest levels of exploitation of the historical period. Vessel carrying capacity in 1983 was 81,800 MT, while it is currently 59,300 MT, which represents a 28 percent reduction. This decline in recent years, with respect to the time when the assessment was carried out (1984), might not have

been accompanied by a similar drop in effective effort, taking into account the increase observed in the individual fishing power of the purse seiners and the important change that occurred, at the end of 1990 and during 1991, in the pattern of exploitation of skipjack, due to the massive introduction of floating objects, especially by the purse seine fleets (about 75 percent of the catches obtained in association with objects are of skipjack).

Besides, it is noted that the reported catches are underestimated, for two reasons:

a) a significant part of small-sized tunas, including skipjack, caught in association with floating objects, are sold at local African markets, and for which the amount and the species composition is unknown.

b) as a consequence of fishing with floating objects, there are sometimes discards of small-sized tunas, among which skipjack could be found.

SKJ-Figures 7 and 8 indicate the changes in the fishery, which clearly show the two periods of effort and their relation to the catches.

As regards parameters such as CPUE, the Committee did not advise interpreting their changes as an index of skipjack stock abundance, since to be considered an index of the biomass of the stock, the catchability should be maintained constant from year to year.

Overall effort exerted in the eastern Atlantic was established from effort data of FIS and Spanish purse seiners, considering an annual increase of 3 percent in fleet efficiency. In comparing the results obtained with the catches made (SKJ-Figure 9), stability is observed until 1990, whereas in 1991, important catches were reached with moderate effort.

In recent years there have been changes in the FIS purse seine fishery strategy; in 1984 and 1988, effort was concentrated on time-area strata with high skipjack concentrations and hence important catches of this species were made, which remained stable during this five-year period. However, skipjack catches by the Spanish fleet still show continuous fluctuations without trend (SKJ-Figures 10, 11 and 12).

It should be noted that the Spanish fleet (since the last quarter of 1990), and the FIS fleet (since early 1991) have started the massive use of artificial flotsam to aggregate the schools, mainly in the equatorial area (6°N-5°S and 3°W-20°W). This activity has been maintained and has resulted in an expansion of the fishery to the west, following the drift of the objects. This change in fishing strategy has not changed the size distribution of skipjack catches (SKJ-Figures 13 and 14), but it has changed the fishing area, which has shifted towards the west (SKJ-Figure 15).

In the baitboat fishery of the Azores Islands, which is the northern limit of the skipjack fisheries, the fluctuation of CPUE, with no trend, is much more marked, (SKJ-Figure 16). This is probably due to the influence of environmental changes. The recent environmental changes in other areas have had a favorable effect. Such is the case of the Madeira Islands, where after various years of practically null catches, the fishery has again developed.

No definitive conclusion can be reached on the state of the eastern Atlantic stock, since the important increase in the catches could be due to conflicting reasons: an increase in the available biomass or an increase in fishing mortality due to an increase in catchability.

SKJ-2.b West Atlantic stock

Skipjack catches in the west Atlantic remain stable, for the various Venezuelan fleets until 1990 (SKJ-Figure 17) as well as for the baitboat fleet of Brazil (SKJ-Figure 18). The low variability of the CPUE's, compared with the large fluctuations that are normally found in the catches of this species, would confirm the local character of these indices.

SKJ-3. Effects of Current Regulations

There are no regulations of any type in effect for skipjack. The current minimum size regulations implemented on yellowfin and bigeye have no effect on skipjack.

SKJ-4. Recommendations

A series of recommendations for all the tropical tunas are presented in Appendix 6 to this Report. The following recommendations specifically concern skipjack:

SKJ-4.a Statistics

i) Continue and improve the evaluation on the volume of the catches of small-sized tunas that are landed at African ports, as well as an estimation, through multi-species sampling, of the proportion of skipjack in these catches.

ii) Attempt to estimate the discards of skipjack of the purse seine fleets, in spite of the difficulties that this would cause.

iii) Improve the collection of catch and effort statistics of the fleets that operate in the western Atlantic.

iv) Improve the sampling quality in the southwestern Atlantic in general and for Brazil, in particular.

v) Improve the multi-species sampling coverage of Venezuelan landings, stratified by gear type, in order to correct the biases detected in the fishing logbooks.

vi) The Secretariat update and improve the current tables on the carrying capacity of the purse seine and baitboat fleets in the east Atlantic, and create similar tables for the west Atlantic. For this purpose, the countries concerned should provide the historical data on the composition of their fleets.

SKJ-4.b Research

i) Improve knowledge on the associations of tropical tunas with (artificial and natural) floating objects, marine mammals, etc., in order to determine the repercussions that these interactions can have on the assessment of these species.

ii) Attempt to assess this species, carrying out the calculations with the current species compositions, which were not available when the last assessment was carried out.

iii) Carry out complementary research on skipjack reproduction in the west Atlantic.

iv) Analyze the changes in effective effort, caused by the decline in competition between vessels due to the decrease in the number of vessels and to the increase in purse seine vessel efficiency with the introduction of bird radars and generalized fishing with artificial objects.

v) Continue research on the effect of environmental factors on abundance, recruitment and availability of skipjack. This would benefit new assessments of the skipjack stocks, particularly from an analytical standpoint.

SKJ-4.c Management

It is not known if the high catches of 1991 can be maintained, but due to the lack of analysis, management measures cannot be established.

ALB - A L B A C O R E

ALB-1. Description of fisheries

ALB-1.a The fisheries

It is generally agreed that the Atlantic albacore resource is composed of a north stock and a south stock, separated at 5°N latitude. Up to now, there have been no studies suggesting that this hypothesis be changed. The two recent GFCM/ICCAT Expert Consultation meetings confirmed that albacore in the Mediterranean should be considered as a third separate stock.

The main albacore fisheries in the Atlantic are shown in ALB-Figure 1.

North Atlantic

North Atlantic albacore are exploited by surface and subsurface gears.

-- Surface fisheries

The trollers and baitboats are mainly Spanish vessels that fish in the summer and autumn in the northeast Atlantic, principally in the Bay of Biscay and

its adjacent open waters. At times, some Spanish baitboats fish in winter and at the beginning of spring in the Canary Islands and during autumn months in the Azores. The French fleet, after a period of sharp decline, introduced two new gears in 1987: driftnets and mid-water paired pelagic trawls. These gears are employed by the vessels at night. The use of the troll during the day has became occasional. Surface fisheries generally catch juveniles and pre-adults (2-15 kg), except in the Canary Islands and Azores where the baitboats exploit both pre-adult and adult fish (about 15 kg or larger).

The Committee noted that, contrary to the information provided last year, a large Taiwanese driftnet operation was conducted for albacore in the North Atlantic in 1990. This operation ceased at the end of 1990. Exploratory driftnet operations by Ireland and Great Britain, quoted in last year's reports, have not yet been confirmed.

A minor fishery is conducted by the U.S. in the northwest Atlantic. Catches are mainly made by the rod and reel recreational fishery, with a lesser amount from coastal pelagic longline vessels.

-- Longline fishery

The longline fleet in the North Atlantic is mainly Taiwanese. It has been markedly reduced since 1987, due to economic factors and a change to targeting on bigeye and yellowfin tuna. These longliners mainly exploit the adult albacore stock.

Size frequencies of fish caught by surface gear and longlines are shown in ALB-Figure 2 for two series of reference years, 1980-1982 and 1989-1991.

South Atlantic

The south Atlantic albacore stock has been mainly exploited by longliners for 30 years. The current main longline fleet is Taiwanese which succeeded the Japanese fleet at the beginning of the 1970's. There are also Brazilian and Uruguayan longline fisheries making minor catches.

A surface fishery is conducted by the South African baitboat fleet in the southeast Atlantic off the southwest coast of South Africa. This fishery started in 1980 and exploits pre-adult and young adult fish from November to May annually, alternating with other fisheries for squid, etc.

Size frequencies of fish caught by baitboat and longline are shown in ALB-Figure 3 for two series of reference years, 1980-1982 and 1989-1991.

Mediterranean

According to the recent GFCM/ICCAT meeting, various small fisheries operate along the French, Italian, and Greek coasts, using baitboats, driftnets, longlines or other unclassified gears. Minor opportunistic fishing by Spanish baitboats and trollers in the western Mediterranean occurred during 1990-1991.

ALB-1.b Catches

ALB-Table 1 and ALB-Figure 4 show the historical series of catches for the total Atlantic, and for the North and south Atlantic and Mediterranean stocks from 1962 to 1991.

North Atlantic

ALB-Figure 5 shows the historical series of catches of this stock, by gear, from 1962-1991. In general, the total catch has followed a decreasing trend over the 1960-1991 period. This decrease is explained mainly by the general reduction in fishing effort of the traditional gears, as well as by the drastic reduction in longline effort since 1987.

In 1991, the total catch in the North Atlantic was 24,700 MT, or 11,600 MT less than in 1990. The surface fisheries caught 22,200 MT in 1991, compared to 33,800 MT in 1990. This important decline of the surface catches can be explained by several reasons which are:

-- The lower catches made by the Spanish troll fleet (9,000 MT in 1991, compared to 10,300 MT in 1990).

-- A drop in Spanish baitboat catches (8,300 MT compared to 15,400 MT in 1990, due to a sharp decrease of the nominal catch rate which lead to an early closure of the fishing season).

Of this total catch, only 600 MT were taken by the Spanish baitboat fleet operating during the fall in the Azores in 1991, compared to the 1990 catch of 1,300 MT.

-- The exceptional 1990 Portuguese baitboat catch of 3,135 MT in the Azores did not continue in 1991.

On the other hand, catches by the new French gears increased to 4,100 MT in 1991, compared to the 3,300 MT in 1990.

South Atlantic

ALB-Figure 6 shows the historical catch series, by gear, for the south Atlantic stock. In general, south Atlantic albacore annual catches showed relatively large fluctuations between 13,000 MT and 38,000 MT during the last three decades. The total 1991 south Atlantic albacore catch was 24,800 MT compared to 28,700 MT in 1990.

Longline catches decreased from 23,400 MT in 1990 to 21,900 MT in 1991. Catches by the South African surface fishery decreased from 5,500 MT in 1989 to 2,700 MT in 1991. Reduced South African catches resulted principally from reduced access to fishing areas off Namibia.

Mediterranean

Reported catches of albacore in the Mediterranean are still minor, ranging between 1,500 MT to a maximum of 4,200 MT in 1985. The catches were lower for 1990 and 1991, at 1,600 and 2,000 MT respectively.

ALB-1.c Fishing effort

North Atlantic

ALB-Table 2 and ALB-Figure 7 show the changes in nominal fishing effort of Spanish and French baitboats and trollers, as well as French gillnet and mid-water trawlers in the North Atlantic since 1975.

-- Trollers

A continuous and significant decrease in nominal fishing effort was noted for trollers from 1967 to 1975, followed by a moderate decrease from 1976 to 1984. The general decline in effort that began in 1967 and continued through 1984 is explained mainly by the gradual disappearance of the French troller fleet.

From 1985 to 1990, effort was stable at a slightly higher level than for the previous period, at an average of 21,500 fishing days. In 1991, nominal troll effort decreased to 14,000 fishing days.

-- Baitboats

Nominal fishing effort for baitboats decreased slowly over the 1967-1977 period, but was rather stable from 1978-1990, at an average of 10,750 days. It dropped to 7,900 fishing days in 1991.

-- Gillnets

Nominal effort of the new French gillnet fleet has increased since its introduction in 1988 and 1989. It decreased in 1990 and increased again in 1991, reaching 1,904 fishing days.

-- Mid-water trawlers

Nominal effort of the new French mid-water trawl fleet increased since its introduction in 1988 and 1989, reaching 2,900 fishing days in 1989, then decreasing until 1991 (306 fishing days).

-- Longliners

Nominal fishing effort for longliners in the North Atlantic (ALB-Table 2 and ALB-Figure 8) showed two periods of high effort, 1976-1977 and 1983-1986. Since 1987, effort dropped to a very low level. This was due to logistic difficulties encountered by the Taiwanese longliners, forcing them to leave the North Atlantic.

In 1990, there was a new increase in the nominal effort of longliners. However, this increase in nominal effort was produced in conjunction with a change in the target species and with a change in fishing strategy through the use of deep longlines at lower latitudes.

In 1990, nominal effort was 17.4 million hooks (7.4 for regular longline, 10 for deep longline). In 1991, nominal effort rose to 23.3 millions hooks (5.5 for regular longline and 17.8 for deep longline).

South Atlantic

In the south Atlantic, the general trend in longline effort by Taiwan remained rather stable (ALB-Figure 9), but an abrupt increase to the historically highest point occurred in 1987, when the decrease in Taiwanese longline effort occurred in the North Atlantic. Subsequently, effort has been sustained at a high and slightly declining level since 1987, reaching a nominal effort of 82.4 million hooks in 1990 (74.9 for regular, 7.5 for deep) and 85.4 millions hooks in 1991 (49.1 for regular, 36.3 for deep).

Nominal fishing effort of the South African baitboat fleet increased from 1980 to 1989. In 1990 and 1991, there was a decrease in the nominal effort of this fleet due to restricted access to fishing areas off Namibia.

Mediterranean

In the Mediterranean, trends in fishing effort are still difficult to determine, due to the absence of a sufficiently long series of statistics.

ALB-1.d Catch rates

North Atlantic

Nominal catch rates of the surface fisheries are shown in ALB-Figure 10. The catch rate trend for the trollers was relatively stable during recent years.

The baitboat catch rate increased in 1976, possibly due to an increase in fishing power resulting from the adoption of sonar equipment, and remained rather stable until 1990. It dropped markedly in 1991.

The new gears (driftnets and pelagic trawls) have been developing since 1987 and their nominal catch rates are in the same range as those of traditional gears.

The nominal catch rate of the longline fishery in the North Atlantic is given in ALB-Figure 11. The longline catch rate remained stable from 1975 to 1983, then decreased gradually until 1991. This decrease is believed to be linked to the shift in the target species.

South Atlantic

ALB-Figure 12 shows the nominal catch rates for the Taiwanese longline fleet fishing in the south Atlantic. Catch rates were stable from 1972 to 1986, then decreased regularly until 1991.

South African baitboat nominal catch rates declined from 2 MT per boat-day in 1987 to 0.8 MT per boat-day in 1990. No value is available for 1991.

ALB-2. State of the Stocks

ALB-2.a North stock

The state of the northern stock is based on the assessment made at the special session on albacore (SCRS/92/22). The catch-at-age table used is shown in ALB-Table 3a.

-- Abundance indices

Age-specific standardized CPUE indices for Spanish surface fisheries from 1983 to 1991 were presented in SCRS/92/150. General Lineal Modelling (GLM) procedures were used to derive these indices from trip data of trollers and baitboats, stratified by year, gear and area. In order to develop indices by age, catch-at-age for the different trips was estimated from the corresponding length composition by applying "Yearly Age Length Keys" (YALK's) derived from the MULTIFAN analysis of document SCRS/92/48. Results varied for the different age classes (ALB-Figure 13), probably being more consistent and reliable for ages 2 and 3, the main exploited age groups, than for ages 1 and 4.

Age-1 indices show large fluctuations that are difficult to relate to fluctuations in recruitment as this age group is not targeted, and is occasionally avoided. Indices for Age-4 show wide fluctuations following a slightly decreasing trend. These indices result principally from catches of baitboats, that are more affected through changing fish availability, by factors such as oceanographic conditions and migration.

Both sets of indices, Age-1 and Age-4, may not reflect correctly abundance of these age classes. This is particularly true for the first age group, due to the reasons mentioned above. Although there are still some reservations with regards to indices of Age-4, the results obtained are more consistent than those obtained in SCRS/91/105, as the correspondence between Age-3 and Age-4 is more realistic. This is probably due to the improved YALK's used in this analysis.

CPUE indices for the main target groups, Age-2 and Age-3, were considered to be reliable and may be considered as estimates of the relative trends of these age groups in the population.

Age-2 indices show a slow increase from 1985 to 1988, a decline in 1989, and an increase in 1990 and 1991, reaching the highest level of the time series in 1991.

Age-3 shows a relatively stable period from 1984 to 1986, a sharp increase in 1987, followed by a slight and continuous decline until 1991. Different probable causes for the decline were given. One was a reduction in catchability by surface fisheries as a result of interaction with new fishing gears introduced after 1987. Another was a decrease in abundance of Age-3 albacore as a result of increased mortality of Age-2, as indicated by the VPA results.

Standardized CPUE indices derived from the Taiwanese longline fishery were presented in document SCRS/92/104. Three different methods of standardization were used: Honma, GLM and simple normalization. ALB-Figure 14 shows the CPUE indices estimated for 1968-1991. (Some sets of 1983-1991 data that were used for tuning the ADAPT VPA (GLM values) are shown in ALB-Figure 13.) According to these results, a relatively stable period from 1968 to 1983 was followed by a continuous decrease, which was only interrupted in 1988 and 1989.

-- Virtual Population Analysis (VPA)

Stock condition was investigated using calibrated virtual population analysis. The catch-at-age table used was obtained using the MULTIFAN method applied to the catch-at-size data (SCRS/92/48). Two VPA methods were applied: the ICES standard *ad hoc* VPA and the ADAPT VPA.

-- *Ad hoc* VPA: The catch-at-age table was set up for ages 1 to 7+ for years 1983-1991. Natural mortality was assumed as M= 0.3. Only the standardized abundance indices (Ages 1 to 4) derived from the Spanish surface fishery were utilized for the tuning. Taiwanese longline indices were not used because they were not split by ages. Therefore, a value of F= 0.1 was set for ages 5 and 6 in 1991. Three different runs were made using different proportions of the average of the F of the four younger ages (2 to 5) to estimate fishing mortality for the oldest age group (age 6): 20%, 40% and 60%.

Although absolute results obtained in the three different runs executed present important discrepancies, in relative terms they show some consistency, as shown in ALB-Figures 15 and 16, where average F for ages 2, 3 and 4, and recruitment for years 1983 to 1990, are presented.

According to these results, there has been an increase in fishing mortality during recent years on the immature fraction of the population. Average fishing mortalities for ages 2 to 4 show an increase from 1983 to 1987, and remain at a relatively high level from 1988 onwards. Recruitment has remained stable during the period analyzed.

-- ADAPT VPA: A catch-at-age table was set up for ages 1 to 11 for years 1983-1991. Natural mortality was assumed as M= 0.3. Standardized abundance indices for ages 1 to 4 from the Spanish surface fishery and for the Taiwanese longline fishery were used to index the VPA trials. The longline indices were considered to be representative of ages 4 and greater. The estimates of mean square error from the fitted model were used as weighting factors in the VPA. Full recruitment was assumed to be age 2, and input selectivity at age was determined from separable virtual population analysis.

After the special albacore assessment session, another run (10th) was conducted, correcting the bounds of one input parameter (upper limit of age 4 abundance), that in the previous runs affected estimation of this parameter.

Results of the ADAPT VPAs lead to conclusions similar to those obtained with the *ad hoc* VPA: an increase in fishing mortality of the younger age groups of albacore (2, 3 and 4 age groups) during the period analyzed and variation without trends in recruitment (ALB-Figures 15 and 16).

However, when these results were compared with the past data, catches and virtual populations between

1975 and 1982, (ALB-Table 3b), inconsistencies appeared: apparent current recruitment levels seem to be substantially lower (about 40%) than those estimated for the 1975-82 period. Possible explanations of this situation are:

i) Systematic underestimation of recruitment by the tuned VPA used;
ii) Unexplained decrease in recent catchabilities of surface gears; and
iii) A real decrease in the average level of recruitment since 1983.

An eleventh run of ADAPT was therefore conducted with the series 1975-1991, using longline abundance indices of Taiwan (1975-1990) and Spanish surface indices (1983-1991) to tune the analysis. Results indicated a decrease in the level of recruitment during recent years (ALB-Figure 17), although the above reservations are still valid for this conclusion.

-- Yield per Recruit (Y/R)

The theoretical yield per recruit was analyzed using the classic Ricker model. The F vectors were calculated as the average of the fishing mortalities for the period 1987-1990, derived from the *ad hoc* VPA (with oldest F= .4 x average of the 4 younger age groups) and the ADAPT VPA (Run 10).

The results of applying effort multipliers varying from 0.25 to 3.0 are shown in ALB-Figure 18. Results derived from both methods lead to a similar Y/R representation.

ALB-Figure 19 shows the Y/R projections according to F multipliers and age at first capture (tc).

From these results, the Committee concluded that the North Atlantic albacore stock could currently be near a highly exploited state. This conclusion is with the reservations mentioned above as to the lack of consistency between the 1983-1991 tuned VPA and the analysis for earlier years. If an underestimation of recruitment was real, it would result in an overestimation of fishing mortalities, and consequently of exploitation level.

The Committee also noted that the current pattern of exploitation concentrates effort mainly on immature fish. Considering that it will be difficult to determine the state of the adult stock in the future due to the sharp decline of the longline fishery in the area, the Committee recommended that close monitoring of the surface fisheries be continued in the future.

-- Recruitment

Recruitment appears rather stable during the period described (1983-1990), as shown in ALB-Figure 16. However, considering the inconsistencies between the tuned VPA assessment and the earlier analysis, the absolute level of recruitment during 1983-1990 is uncertain. Two possibilities, at least, can be considered:

i) a relatively well estimated constant recruitment through the period, but with a scaling error in one or the other period;

ii) A real, but unexplained, decrease in recruitment occurred during the 1983-1991 period.

ALB-2.b South Stock

Two CPUE indices for the Taiwanese longline fishery, one standardized using the Honma method and the other standardized using a General Linear Model, are the only available indices for the South Atlantic albacore stock (ALB-Table 4 and ALB-Figure 20, SCRS/92/104). This fishery exploits mainly adult albacore and it was noted that no applicable abundance indices have yet been proposed for the juvenile portion of this stock.

Standard production model assessments were fitted to these abundance index data series. Mean annual weights were used to convert CPUE data in number of fish caught per 100 hooks to weight of fish caught (ALB-Table 4) and effective effort was derived from the total annual catch divided by standardized CPUE to produce an effective effort series. Both CPUE index series have similar trends from 1973 onwards, with the Honma-standardized index showing fluctuations from 1968 to 1986, followed by a sharp decline thereafter. The GLM-standardized index fluctuated around a decreasing trend until 1986, with a constant decline thereafter.

Equilibrium production models (PRODFIT) fitted to these series showed estimated MSY values of 27,000 MT at an optimum effective effort of 277 million

effective hooks (Honma standardization, m = 1.001, k = 4) and 26,000 MT at an optimum effort of 100 million effective hooks (GLM standardization, m = 1.001, k= 4) (ALB-Figure 21).

Such equilibrium production models have, however, been shown to produce substantially positively biased estimates of MSY (SCRS/92/171). An alternate assessment using a dynamic production model (Punt, 1992, ICCAT Coll. Rec. Doc. XXXIX (1): 215-224) produced from the Honma standardized data series available at the 1991 SCRS meeting suggested an MSY of only 20,000 MT, with a current annual sustainable yield of slightly less than 15,000 MT. This analysis further indicates that the available exploitable biomass has declined from 165,000 MT in 1960 to approximately 26,000 MT in 1990.

Equilibrium production model analyses indicate that catches of south Atlantic albacore slightly exceeded MSY between 1985 and 1990, with effort exceeding optimum effort after 1987 (ALB-Table 4). In contrast, non-equilibrium assessments suggest that MSY levels have been markedly exceeded for at least the past five years and that the exploitable biomass and sustainable yield levels are low. The contrast between current predicted yield levels and historically sustained catches is cause for concern and research efforts must be made to substantiate assessments using alternate methods, particularly ADAPT-type VPA assessments using the recently created catch-at-size database for this stock.

It appears that the south Atlantic albacore stock could have been strongly exploited and must be closely monitored using all applicable assessment methods. The sudden increase in estimated effective effort in recent years is cause for concern, although this may be due to erroneous inclusion of effort for deep longlines targeting bigeye tuna, rather than albacore. It was recommended that this Taiwanese deep longline effort be taken into consideration when estimating effective CPUE indices for future assessments. It was further recommended that analytical models and recruitment indices be developed for the south Atlantic albacore stock.

ALB-2.c Mediterranean

No evaluation of the state of the Mediterranean stock has yet been possible because of the lack of sufficient data on these fisheries.

ALB-3. Effects of Current Regulations

No regulations are presently in effect for albacore in the Atlantic Ocean.

ALB-4. Recommendations

ALB-4.a Statistics

The Committee made the following recommendations:

i) The ICCAT criteria for data submission must be strictly observed by national scientists in the collecting and presenting Task II catch and effort and catch-at-size data. It would be desirable to obtain surface fishery data stratified by at least 5°x5°, and even better by 1°x1°.

ii) Task II longline data should be reported separately by deep and by regular longline.

iii) Complete ICCAT tagging files should continue to be maintained and special efforts should be made to check and recover the entire data file by Albacore Program scientists involved.

iv) The meeting held between GFCM/ICCAT scientists has proved to be highly beneficial. The Mediterranean data base has been improved and this work should continue in the future.

v) Standardized abundance indices were obtained for surface fisheries combined. Disaggregated standardized indices for both troll and baitboat fisheries and for gillnets should be calculated in the future.

vi) Standardized abundance indices in weight for surface gears using the GLM method should be developed in order to calculate the overall standardized effort index for surface gears for the period 1983 onwards.

vii) Standardized longline abundance indices by age should be developed in order to calibrate the VPAs.

viii) Improvements in the ICCAT Secretariat computer software, hardware and experience with models for stock assessments should be considered carefully for the next albacore meeting.

ix) Concerning the U.S. albacore fishery, appropriate biometric conversion formulae should be provided to convert dressed-weight frequencies to round-weight frequencies.

x) A data file of nominal effort should be maintained by the ICCAT Secretariat for albacore fisheries.

xi) The use of MULTIFAN version 3.1 software to obtain catch-at-age data has proved to be quite useful. Its application should be continued for the north stock of albacore and, when possible, it should also be applied to the south stock.

ALB-4.b Research

The Committee made the following recommendations:

i) The contrast between results of production model analyses for the south Atlantic stock using standard and non-equilibrium models indicates strong positive bias in MSY estimates using standard equilibrium production models. A non-equilibrium production model (e.g., ASPIC) should be fitted to available abundance indices for both the northern and southern stocks.

ii) The Committee encouraged the use of ADAPT VPA assessments, or similar analyses, for further assessment of northern and southern stocks. In particular, application of such tools to the recently created catch-at-size database (when corrected) for the southern stock may help resolve conflicts in current production model assessments.

iii) For the northern stock, a more thorough analysis of the entire 1975-1991 series of catch at age should be carried out.

iv) The general decrease in recruitment of northern stock for years 1983-1991 should be investigated as to if it reflected the real situation.

v) Research must be continued to establish ageing methodology using hard parts for large fish in the North Atlantic. Verification of research results should be carried out to complete validation requirements by the end of the Albacore Research Program.

vi) Collection of spines from a full range of albacore sizes in the first quarter of the year in the North Atlantic is urgently needed.

vii) Ageing research on the Mediterranean stock should be reported to the Albacore Research Program.

viii) The ageing program done for the south stock using hard parts should be compared to the results of applying the stochastic ageing method (MULTIFAN).

ix) Analysis of information from tag-recapture data must continue.

x) A final meeting of the Albacore Research Program is to be held in mid-1994.

xi) The Committee recommended that albacore be included in the proposed intersessional meeting on ageing methods to be held in 1993.

ALB-4.c Management

No management recommendations were proposed. However in view of the conclusions achieved for both the north and south Atlantic stocks, close monitoring of these stocks should continue.

BFT - BLUEFIN TUNA

BFT-1. General Description of Atlantic Fisheries

Bluefin tuna is a long-lived species that occurs in all the oceans of the world. Atlantic bluefin tuna is taken along the east and west coasts of the Atlantic Ocean and in the Mediterranean Sea. A large number of countries catch this species with many gears, among which longline and purse seine are the most important. Different fisheries operate in the eastern and western Atlantic. For example, a relatively large catch of bluefin is made by rod and reel in the west, while in the east, large catches are made by baitboat, purse seine and trap fisheries. The size of the fish caught varies in accordance to the gear used, the time of year and the area fished.

The SCRS has been conducting assessments of Atlantic bluefin for many years under the hypothesis of

the existence of two separate stocks with a limited rate of exchange: one stock in the east Atlantic, including the Mediterranean, and one in the west Atlantic, divided at 45°W in the northern hemisphere and 25°W in the southern hemisphere (BFT-Figure 1).

The total Atlantic and Mediterranean bluefin catch for 1991 was 24,400 MT. Although provisional, this amount is 310 MT lower than the 1990 total and reflects a decrease which began in 1988 (BFT-Table 1 and BFT-Figure 2). As the amounts caught have been stable for the west Atlantic after the measures taken in 1982 regulating the level of catches, this decrease is generally attributed to east Atlantic catches which have gone from 6,700 MT in 1988 to 5,300 MT in 1991. At the same time, the catches landed from the Mediterranean have declined slightly, from 17,200 in 1988 to 16,300 MT in 1991.

Although the amounts reported for the west Atlantic are updated regularly, collecting catch data for the east Atlantic, and even more so for the Mediterranean, is hindered by the great number of nations/gears exploiting this resource. As a result, much of the data for 1991 are either preliminary estimates or are values assigned based on reports from the preceding year.

Japan is a large consumer of bluefin tuna and imports significant quantities of this species from different countries. Market data occasionally indicate significant differences between the reported import figures and the reported catches, suggesting under-reporting of some national statistics, because landings of these fish can be made very far from where they are caught and because some species, such as southern and northern bluefin, are confused in their identification.

Since 1991, and following the proposal by the SCRS, assessments for eastern and western stocks of bluefin are done in alternate years. As the 1991 assessment had been dedicated to the western stock, the SCRS focused its attention on the east Atlantic stock in 1992. However, The SCRS reviewed the information on the west Atlantic fisheries and catches so that no significant change would go unnoticed.

BFT-1W. Description of West Atlantic Fisheries

Catches in the west Atlantic (BFT-Figure 2) have been restricted by regulation to 2,660 MT annually since 1983, about half the average during the period 1973-1981. (In 1982 the catch limit was 1,160 MT.) The total reported catch in 1991 was 2,843 MT, about 80 MT more than 1990, mostly due to the increase in the Canadian catch. Under-reported and unreported volume was estimated by comparing catch statistics, by country, with the Japanese import statistics. The estimates of under- and unreported catches from the west Atlantic were small compared to those estimated for the eastern Atlantic and Mediterranean. However, the Committee believed the west Atlantic quantity was likely still under-estimated.

BFT-1E. Description of East Atlantic Fisheries

BFT-1E.a East Atlantic (BFT-Figure 3 and BFT-Figure 4a)

The majority of the landings reported in 1991 for the east Atlantic (5,300 MT) are made in similar proportions for the traps (34 percent), baitboats and longlines (31 percent each). The Moroccan surface catches and French gillnet and mid-water trawl catches form the major part of the remaining 4 percent. Baitboat catches which were stable in 1988 and 1989 (about 2,680 MT) decreased in 1990 and 1991 to 1,993 MT and 1,648 MT, respectively. The decrease was especially noticeable in Spanish baitboat catches and was somewhat compensated by an increase in catches of French baitboats, even though the number of these has decreased. There was a decrease of 16 percent in Spanish trap catches, while there was an increase of 9 percent in the catch of the Japanese longliners. This increase was mainly due to increased effort in the Japanese winter longline fishery between 30°W to 45°W.

BFT-1E.b Mediterranean (BFT-Figure 3 and BFT-Figure 4b)

The Mediterranean is characterized by a significant number of countries fishing for bluefin tuna with a great diversity of both very ancient and very modern gears. Because of this, it is difficult to obtain complete catch data from the Mediterranean fisheries. Many of these countries are not members of ICCAT but they do form part of the General Fisheries Council of the

Mediterranean (GFCM). Two joint GFCM/ICCAT meetings (Bari, 1990 and Crete, 1992) led to marked improvement in the current and historical catch data. Data reporting in 1991 from the Mediterranean (16,300 MT) reflects this improvement since only 19 percent of the 1991 catches were estimating by assigning previous year reports.

Information on the origin and volume of imports of bluefin tuna by Japan has allowed estimating of under-reported or unreported catches which are included under the classification "NEI" (Not Elsewhere Included). A large part of the unreported or under-reported catches were caught by vessels flying flags of convenience.

The SCRS has expressed its concern on the lack of information from some fisheries, regarding the amount of catches as well as the size composition. This may represent more than 5,000 MT in the last few years (20 percent of the reported catches).

The French, Italian, Turkish, and Yugoslavian (Croatian in 1991) purse seine catches comprise 71 percent of the landings with a total of 11,604 MT. French and Italian purse seine activities have remained at the same level as the two preceding years, which is around 4,500 MT and 2,400 MT, respectively, while there was a marked increase in landings by Tunisian purse seiners. The unclassified Algerian, Italian and Spanish gears represent 89 percent of this category and 14 percent of the total caught in the Mediterranean. The trap catches dropped in comparison to last year, going from 1,545 MT to 639 MT. This decrease concerns the Moroccan and Spanish traps. In part this is explained by a decrease in the number of Spanish traps in operation.

BFT-2E. State of the Stocks, East Stock

The Committee discussed the methods available for evaluation of the state of the eastern Atlantic stock of bluefin. Much of the Committee's previous efforts have been directed at conducting age-sequenced analyses of bluefin catch and effort data. It was noted that recent progress made in the application of non-equilibrium production models provided another analysis tool that could be applied to east Atlantic and Mediterranean bluefin catch and effort data. The Committee discussed the potential advantages and disadvantages of application of both model types to the east Atlantic bluefin data. It was decided that the application of both model types to the data could provide additional insight into the status of this resource. However, given the limited time available for conducting the assessment, the lack of standardized time series of biomass CPUE needed for the non-equilibrium production model, and to provide consistency with previous assessment methods applied to this stock, highest priority was given to conducting the age-sequenced analysis (VPA) for assessing the state of the stock.

BFT-2E.a Natural mortality and growth

The same growth equation, estimated by Cort (1991) and the same assumed value (0.14) for the instantaneous rate of natural mortality were used as in the previous east Atlantic-Mediterranean stock assessment (1990).

BFT-2E.b Catch at age

Catch at size was available from 1960-1991. Since 1984, the SCRS has decided to restrict its virtual population analyses to the years since 1970, primarily because of concern that there was only a limited number of size samples available for earlier years. Even for the most recent period (1970-1991), the Committee noted that a high proportion of the annual catch-at-size information was based on substituted size samples being applied to catches by fisheries for which no size information was available (BFT-Table 2, BFT-Figure 5). For catches from the east Atlantic, there was a decrease in the catches that required substitution since 1970. Between 1970 and 1978, an average of 45 percent of the catches from the east Atlantic required sizing with samples taken from other fisheries, but from 1979-1991, the average percentage was considerably smaller (16 percent), indicating an improvement in the sampling programs for these fisheries (BFT-Table 2).

In the Mediterranean, however, an average of 50 percent of the catches made from 1970-1991 required sizing with samples taken from other fisheries (the lowest yearly value of 26.5 percent was in 1979 and the highest yearly value of 77.6 percent was in 1972) (BFT-Table 2). The Committee expressed concern over the possibility that the resulting catch-at-age data from catches sized with such a high substitution rate could

contain considerable error, and might be substantially different from that which would be calculated by applying different substitutions to the catches for which no size data are available. For this reason, the Committee decided to examine the sensitivity of the catch at age to an alternative set of sizing substitutions. However, for the purpose of conducting a base case assessment, the substitutions reviewed at the 1992 GFCM/ICCAT meeting were used for calculating catch at size.

The catch at size was converted to catch at age using the age slicing system established by the SCRS. That system is primarily based on the growth curve estimated by Cort (1991). The estimated catch at age, through age 15+, is shown in BFT-Table 3. The highest proportion (about 90 percent) of the catch of east Atlantic and Mediterranean bluefin tuna is of fish of ages 0-4 years (BFT-Figure 6). In general, fish from this age category are not spawners, and thus are being harvested before contributing to the reproductive success of the stock. Catches of age 0 fish are very under-estimated and sporadic studies show that these catches are important.

BFT-2E.c. Abundance indices

Eight abundance indices were examined by the Committee (BFT-Table 4, BFT-Figures 7a, 7b, and 7c). Five of these were used for calibration of the VPA in the 1992 SCRS assessment. The five series are catch rates for the Spanish trap and Japanese longline fisheries for large tuna, and the Spanish baitboat, and French purse seine (two separate indices) fisheries for small bluefin. Two other indices (Italian purse seine ages 3-7 and ages 8+) were considered to require further analysis and recent data points before they could be used for tuning. Questions raised about the two Italian purse seine indices at the 1992 GFCM/ICCAT meeting (COM-SCRS/92/17) were not resolved in time for consideration of the indices in the tuning procedure.

The eighth series (the Japanese longline catch rate for large tuna in the east Atlantic and Mediterranean for the period 1975-1991) was revised by the Committee. Because of small numbers of fish sampled for ageing the Japanese longline catches in 1978 and in 1982, these years were excluded from the catch rate standardization procedure, and the CPUE series was revised. The revised series (BFT-Figure 7c) showed a very similar pattern to the entire time series. With respect to the Japanese longline series, the catch rate data from the east Atlantic and the Mediterranean were standardized within the same model, resulting in a single index from these data, rather than a separate index for the east Atlantic and Mediterranean, as provided in previous years. The Committee preferred the combined series for use in tuning the model.

Further evaluation of the CPUE series used in tuning the VPA was conducted by examining the residual patterns for each index fit to the catch-at-age data. Non-random patterns in the residuals, such as runs of consistently positive or negative values, suggest the presence of systematic differences between predictions of the VPA and the actual CPUE data. Such patterns can result from changes in catchability or changes in other characteristics of the fishery (discrepancies in reporting catches, etc.) that are not adequately controlled in the procedure used to standardize the CPUE data.

Such patterns were observed in two of the indices examined: the baitboat index for young fish and the trap index for large fish. After considerable discussion, the Committee decided that the use of sonar by baitboats could have led to a change in the effective effort of these vessels, a change that may not have been sufficiently controlled in calculation of the annual CPUE values. Sonar was widely used by this fleet by 1978 and the Committee therefore decided to separate the CPUE into two series (1970-1977 and 1978-1991) to account for the hypothesized change in effective effort that may have occurred from the wide use of sonar in the fleet.

In the initial VPA fits to the trap index for large fish, the residuals were consistently negative in the period 1971-1981 and consistently positive in the period 1982-1991. Examination of the catch-at-age data showed a consistently higher proportion of fish of ages 7, 8, and 9, compared to ages 10 and older in the catches from this gear in the 1982-1991 period. After discussion, it was decided that the apparent change in the catch of 7, 8, and 9 year-old fish by this gear may have resulted from increased market demands for fish of this size class, or some other effect not related to abundance of the stock. For these reasons, the Committee decided to separate this index into two series for use in tuning the VPA: one for 1971-1981 and one for 1982-1991.

In the final tuning of the VPA, the indices were weighted in proportion to the inverse of the mean square error in the model fit contributed by each

index, by application of an iterative re-weighting procedure. This procedure results in more precise estimates of stock sizes in the most recent year of the catch and effort series than procedures that assign equal weights to the indices. The results of the base case assessment fits of the indices used and the estimates of stock sizes are shown in BFT-Figure 8.

BFT-2E.d Partial recruitment

The Committee studied the partial recruitment pattern in 1991 using separable virtual population analysis (SVPA) as it had in the past. Catches for ages 1-14 from 1988-1991 were used to estimate the selectivity pattern. Ages 10-14 were used to obtain an indication of the relationship between the fishing mortality rate (F) on age 9 and older ages. One level of F (0.3) and three different ratios of selectivities for age 2 vs. 14 (0.5X, 1X and 1.5X) were explored. The estimated selectivity pattern showed little sensitivity to these inputs, and therefore the final selectivity pattern for the terminal year was selected from the analysis using an F of 0.3 and a relative selectivity of age 14 equal to that of age 2.

The Committee also used SVPA to examine the relationship between the selectivity patterns as well as the relative selectivities of ages 10-14 to age 9 in earlier years. Four periods were considered for these examinations, because it was considered that this relationship may have been relatively stable during those years. Those periods were: 1970-1973, 1974-1981, 1982-1987 and 1988-1991. The ratios of ages 10-14 to age 9 were examined with an input of selectivities on age 14 being 0.5, 1.0 and 1.5 times the selectivity on age 2; little sensitivity to these inputs was observed in the relationships of F's on ages 9 and 10. The Committee noted that there appeared to be no difference in the estimated selectivity pattern for the 1974-1981 and 1982-1987 periods, but that the selectivity pattern estimated for the earliest period (1970-1973) and the latest period (1988-1991) showed some differences (BFT-Table 5, BFT-Figure 9). Lower selectivity for age 10 fish, relative to age 9 was evident in the early period and this selectivity was higher in the most recent period (1988-91), when compared to the middle periods (1974-81 and 1982-87). The F's on ages 10+ were estimated to be 3.65, 2.85, and 0.60 times the F's on age 9 during the 1988-1991, 1974-1987, and 1970-1973 periods, respectively.

BFT-2E.e Population Analysis

The refinement of the eastern Atlantic bluefin stock assessment methodology and data base continues, reducing some of the uncertainties associated with past assessments. However, improvements in the data base, especially from the Mediterranean, need to be made to reduce the considerable remaining uncertainties. The general conclusions from the base case assessment are similar to those presented previously. The 1992 assessment is illustrated in BFT-Figure 10. The estimated numbers of fish at each age and fishing mortality rate by age are given for the years 1970-1992 and 1970-1991, respectively, in BFT-Table 6 and BFT-Table 7. Sensitivity analyses were also carried out to evaluate the effects, upon hypotheses concerning the different periods, of disregarding portions of the catch and of applying alternative selectivity assumptions for sizing the catches for which no size data are available. Results of the base case analysis and of the sensitivity trials are described below.

Base Case Assessment Results:

This base case assessment is conducted using Virtual Population Analysis (VPA) which utilizes catch at age and indices of abundance. Estimates of stock size in the most recent year obtained from VPA are subject to more uncertainty than are the estimates in the same analysis for the stock size two or three years earlier. Investigation of the VPA results was made to examine them for possible underestimation or overestimation. The estimates of young fish stock sizes (ages 2-4, BFT-Figure 11) in recent years, as implied in the present VPA, were found to depend somewhat upon the number of years of data in the analysis. Although there was some tendency for increasing stock size estimates of young fish with increasing number of years included in the analysis (VPAs for 1970-1989, 1970-1990, and 1970-1991 were conducted with the current data set) the size of the change between successive years was not thought to indicate a strong retrospective pattern in these data. In addition, there was no consistent pattern seen in the other age groupings. In other words, the current estimate of the 1992 stock sizes which was made using the base case catch at age and CPUE may change in the next assessment with the addition of more data, as there is

more uncertainty in the estimates of stock size for the most recent year than in prior years in the analysis (especially for young fish). However, the magnitude and direction of the change is not evident from this retrospective analysis of the current VPA. However, changes in the assumed catch-at-age matrix could also result in different estimates of 1992 stock size.

The 1982 year-class was the largest estimated for the 1970-1991 period; this cohort has now passed into the oldest age grouping (entering into the age 10+ grouping in 1992) and has already been fished fairly heavily. There is no evident trend in recruitment (estimates of age 1 stock abundance are the most variable of those shown in BFT-Figure 10 and there is more uncertainty in these estimates than for other age groups). There is positive correlation between the estimated fishing mortality rate trajectory and the estimated stock size trajectory. This indicates that the fisheries for small fish may fish more heavily on relatively strong cohorts as they first become available to these gears. In the base case, estimated fishing mortality rates for this age group are relatively high (estimates of F for age 1 fish generally range between 0.3 and 0.6 for the 1983-1990 period, see BFT-Figure 10, BFT-Table 7).

Estimates of stock size for ages 2-4 in the base case assessment have also shown variability over the 1970-1991 time period (BFT-Figure 10, BFT-Table 6), although this variability is less than seen for age 1 fish. The reduced variability is partly the result of the fact that there are 3 ages in this grouping (multiple ages in a grouping tends to dampen variability, when compared to the variability in single age abundance trajectories). In the base case results, abundance of this age group appears to have increased slightly from levels estimated for the early part (1970-1974) of the time series, but most recent abundance estimates (1987-1991) are lower than those from the period 1984-1986, which corresponds to the time period during which the 1982 cohort was included in this age group. Estimates of fishing mortality rate on this age group have also shown variability, although there has been an increasing trend in estimates of F from levels ranging from 0.2-0.4 during the 1970-1975 period to recent levels around 0.6 or higher since 1985 (BFT-Figure 10, BFT-Table 7).

Estimates of abundance of fish aged 5-9 (BFT-Figure 10, BFT-Table 6) also show variability that may, in part, reflect the passage of relatively strong cohorts through the age group (the 1982 cohort was part of this age group from 1987-1991). The average estimated abundance of this age group during the 1987-1991 period was about 80 percent of the average estimates for the age group in the 1971-1975 period. The average abundance for the most recent period was also equal to the average in the 1980-1984 period. Fishing mortality rate estimates for this age group are also variable, but are lower than the rates estimated for both younger and older fish (estimates of F for this age group have ranged from about 0.05 to 0.2 over the time series), reflecting the relatively lower assumed catches of fish in this size range made by the various eastern Atlantic and Mediterranean fisheries. However, the highest estimates of F (generally ranging from about 0.1 to 0.2) have occurred in the period since 1983, while F estimates from the earlier period (1970-1982), were usually between 0.05 and 0.1 (BFT-Figure 10, BFT-Table 7). As stated earlier, the estimates of F on this age group are relatively low compared to those estimated for younger fish.

Abundance estimates for the oldest fish in this stock (ages 10 and older) have shown a consistent downward trend since 1970, although with some variations, including a moderate increase since 1990 (BFT-Figure 10, BFT-Table 6). The 1982 cohort entered into this age group in 1992. Overall, the average estimated abundance of fish in this age group for the period 1990-1992 was about one-third of the average estimate from the 1970-1972 period. Estimates of F on this age group from the base case assessment increased from levels around 0.3 in the early 1980's to levels of 0.6 and higher in the most recent period (1989-1991, see BFT-Figure 10, BFT-Table 7). In the base case, the estimated abundance of fish aged 5 or older, which includes most of the spawning stock, has shown a consistent downward trend. The average estimated abundance of age 5+ fish in the most recent three years (1990-1992) is about one-half of the average estimates from the first three years of the time series (1970-1972).

Sensitivity Analyses:

The Committee conducted investigations of the sensitivity of the VPA estimates to modeling and data assumptions.

A number of sensitivity trials were used to develop the base case model. These investigate the effects of estimating different numbers of abundances directly, rather than assuming predetermined relationships

among various ages. First, the Committee studied the method of estimation of the abundance of the 10+ group in each year; in previous analyses of this eastern Atlantic management unit, the relationship between the oldest age group and one or more of the younger ages had been assumed to be constant. The Committee concluded that the assumption of constancy in the ratio of F on age 9 to F on ages 10+ was not supported by the data, it observed differences in the 10+ population abundance trajectories made with and without that assumption, and decided to estimate more than one such ratio. The second investigation of modeling assumptions examined the effects of estimating different combinations of stock size at age in 1992. The Committee observed very little difference in estimates between the base case in which three age-specific 1992 abundances were estimated and a case in which seven 1992 abundances were estimated, though the uncertainty about the estimates increased, in the latter case.

The Committee noted a high degree of uncertainty about the magnitude of estimated catches for several fisheries and was particularly concerned about the estimates for Italian Adriatic fisheries and Algerian fisheries. Catches from those two fisheries have ranged from 100-500 MT in the 1970's to nearly 2,000-3,000 MT in recent years. The Committee conducted virtual population analyses excluding those catches, and observed only small differences in the trajectories of estimated fishing mortality rates (BFT-Figure 12).

The Committee investigated the effects of assumptions about the size composition of catches of three groups of fisheries for which size samples were often not available, using one alternative set of substitutions. They were: the high-seas longline fisheries, the Mediterranean fisheries for large bluefin, and the Mediterranean fisheries for small bluefin. The information on fisheries for which size composition was usually available was not changed. Results of the estimated fishing mortality rate trajectories were similar to those estimated in the base case (BFT-Figure 12). In addition to similar trends in F, the magnitude of estimated F's for ages 2-4 were similar to the base case. This result implies that the fishing mortality rate estimate for this age group was insensitive to this change in the catch-at-age matrix. For the older ages estimates of F frequently differed from the base case. Estimates of F for 5-9 year-olds were lower than the base case after 1986, but similar in earlier years. For ages 10+, which have accounted for less than 10 percent of the catch throughout the period (BFT-Figure 6), the estimates of F levels were consistently lower suggesting higher 10+ stock size estimates than in the base case. However, in a relative sense, the change in estimated level of age 10+ stock size over the time period was very similar to the base case. The Committee noted that for younger ages all analyses indicated high levels of fishing mortality (about 0.6 in the most recent period).

These analyses indicate the importance of obtaining basic data from all fisheries and suggest that increased efforts are needed to obtain both historical and current information before the uncertainties in the assessment analyses might be reduced. The Committee noted that the alternative assumptions about catch and size composition that went into these analyses were made to examine effect, that with the limited time available only gross assumptions could be made, and that a wide range of the assumptions are possible. The Committee recommended careful examination of alternative assumptions for use in conducting more formal sensitivity analyses in the future assessments.

Non-Equilibrium Production Model:

The Committee was unable to complete analyses with a non-equilibrium production model, because of the limited time available and the lack of sufficient data (only catch and effort data were available for a few of the fleets, most of which was from a very short time period). A preliminary run of the model was completed using the available data, but because the Committee was unable to thoroughly evaluate the data and the particular assumptions made for this run, the Committee felt it was inappropriate to present these results.

BFT-2E.f Yield per recruit

The assessment allows consideration of the impact of maintaining the current regulation as it is presently being implemented and the impact of modified forms based on size categories. For this purpose, two yield per recruit simulations were conducted (BFT-Table 8). The two analyses that were conducted were: (a) assuming the 1991 fishing pattern estimated from the

base case VPA; and (b) modifying the estimated 1991 fishing pattern by assuming that there would be no fishing mortality on ages 1 to 3 (small fish). In case (a), present (1991) fishing mortality rates are in excess of yield per recruit benchmarks (F_{max}, $F_{0.1}$); and thus, the yield per recruit would more than double from about 11 kg to about 23 kg, if there were large reductions in the overall fishing mortality rate to the estimated level of F_{max}. In case (b), the decrease in small fish mortality would increase yield per recruit from 11 to about 33 kg. These results support previous reports of SCRS that substantial gains in yield could be realized by a reduced mortality rate and/or an alternative mortality structure by age.

It is clear in this context that the pattern of high fishing mortality on small fish, which is a consistent feature across the base case and each of the sensitivity analyses, has reduced the potential for increases in yield that might be realized. Increases in yield per recruit can be expected by avoiding capture and mortality of small fish. This increased yield could support a wide range of spawning stock sizes. Alternatively, substantial reductions in the capture of small bluefin should have a high probability of significantly increasing the abundance of medium and large fish.

BFT-2W. State of the Stocks, West Stock

Since in 1992 The Committee concentrated its efforts on updating the assessment of eastern Atlantic bluefin stock status, no in-depth discussions of western Atlantic bluefin stock status were held. However, the Committee was pleased to note that a large number of scientific working documents detailing 1991 and 1992 research results on west Atlantic bluefin tuna were provided to SCRS for reference. The Committee decided to defer detailed discussions of these documents until the next assessment meeting (1993) for west Atlantic bluefin tuna.

BFT-3E. Effects of Current Regulations

The ICCAT recommendations for the management of the east Atlantic stock of bluefin tuna went into effect in August, 1975.

The first recommendation was to limit fishing mortality of bluefin tuna in the entire Atlantic and Mediterranean Sea. If this is interpreted as a limitation of catches, the effectiveness of the recommendation could be noted by studying the catch trends after this date in comparison to the preceding period.

The east Atlantic catches went from 23,000 MT (1962) to 10,000 MT (1975), then to 5,200 MT in 1976. Then they increased to 7,000 MT in 1977, decreased regularly to 3,300 MT in 1981, then increased again during the three subsequent years to around 7,000 MT. From 1985 to 1987, the catch averaged 4,500 MT; in 1988, it increased to 6,700 and slightly decreased in a saw-toothed pattern to 5,300 MT in 1991. The current catch levels are somewhat below those reached in 1975.

In the Mediterranean, the catches varied around 5,000 MT between 1962 and 1973, with a slight increase in 1967-1969. Landings then increased, although still fluctuating widely, going from 10,000 to 17,000 MT, except for 1978 and 1979 in which the landings were less (8.800 and 7,400 MT, respectively), and for 1985 when the catches reached a peak of 19,400 MT. In the last three years, the catches seem stable at slightly below 16,000 MT. The level of the catches for the entire period following the regulation, since 1991, is almost always higher than the 1975 level (11,000 MT).

The second recommendation prohibited the catching and landing of bluefin tuna less than 6.4 kg in the entire Atlantic, with a tolerance limit of 15 percent (in number) for incidental catches. Part of the variability observed in BFT-Table 9 could be due to the gaps in sampling, as well as to changes in the fisheries. After the entrance into effect of this regulation, the percentage of bluefin less than 6.4 kg was still high in the east Atlantic and Mediterranean, with an average of 51 percent and 36 percent, respectively, during the 1975-1991 period. There is a marked decrease in the east Atlantic for the last few years (73 percent in 1988 to 33 percent in 1991), while the percentage was subjected to strong variations in the Mediterranean. It should be noted that the catch of age 0 bluefin tuna is significantly under-estimated and the proportion of these fish in the catch could be much higher than indicated in the official statistics.

Few studies were carried out on this subject. Some sporadic surveys indicate that the under-sized fish in the Mediterranean are greatly under-estimated for some countries. Following the local market trends, many of these nations continue to target small-sized

fish, in spite of the development of a market for exporting very large fish to Japan.

BFT-4E. Recommendations for East Atlantic Bluefin Tuna

The Group reviewed the recommendations formulated at the recent joint GFCM/ICCAT meeting. Although they are applicable to all the large pelagic fishes of the Mediterranean, these recomdations are very similar to those formulated expressly for east Atlantic bluefin tuna.

BFT-4E.a Statistical data and analysis

The decision to carry out assessments in alternate years for each of east and west Atlantic bluefin stocks on a bi-annual basis is beneficial for the Committee. This is the first year the SCRS is carrying out this process on the east stock. This has allowed a more in-depth study of the validity of the basic data necessary for the assessment and the Committee has identified many problems, some of which are not new.

One problem concerns the quality of the catch data and the related size composition. The SCRS recommended that the Contracting and non-Contracting Parties of ICCAT fishing for this species provide catch data associated with fishing effort and size composition in time-area strata as detailed as possible. The Committee considered that the problems are crucial in the Adriatic, in the eastern part of the Mediterranean Basin and for some north African countries. The problem of the vessels flying flags of convenience of countries which do no report their catches was also subject of attention of the SCRS. It is requested that any approach to report these landings, especially from information on the origin and volume of Japanese imports, be continued.

Another problem is the number of countries/gear actively operating in this fishery. The SCRS is sometimes obliged to make suppositions on the sizes of the fish caught in a particular area by a specific gear. The result is that some substitutions carried out to establish the catch at size are not adequate and, at a given size, could corrupt the catch-at-age tables. The participation of a larger number of national scientists who know their fisheries would increase the precision of the analyses carried out and reduce the time necessary for making many sensitivity studies on uncontrolled parameters.

As regards these two points, the SCRS recommended that a joint GFCM/ICCAT *ad hoc* working group be set up as soon as possible, as was proposed at the Second GFCM/ICCAT Consultation in Crete. The SCRS also suggested that a joint GFCM/ICCAT meeting be held just before the meetings of the east Atlantic assessment group in order to carry out an evaluation of the Mediterranean stock.

The Group noted with satisfaction the presence of many scientists interested in the assessment work on bluefin tuna. Because of the increase in participation of scientists interested from countries that fish bluefin tuna, the SCRS advice on the assessment of this species will be expanded.

BFT-4E.b Research

Although progress has been made on the knowledge of the biology of bluefin tuna, the Committee recognized a number of topics that require close attention. These topics should be incorporated into the Bluefin Year Program (BYP) or into any research on this species, in order to have international coordination and standardized methodology.

The growth of bluefin tuna needs to be validated, particularly during the winter phase when few samples have been collected up to now. The between-year and between-season fluctuations in growth should also be refined.

Information on the rate of sexual maturity and the fecundity by size is essential in order to determine the amount of the fertile biomass which assures the durability of the stock and studies should be carried out in this sense.

Good management of the stocks involves knowledge of its structure and ranges. Tagging of juveniles as well as adults should be continued and increased in order to have a better understanding of the migration patterns and the exchanges of fish between areas. It was noted that two additional transatlantic movements of bluefin were documented in 1992. Improvement of the tag-recapture computer files is also recommended.

Some larval surveys of tunas have shown that in the Mediterranean, bluefin tuna may reproduce in more varied areas than previously believed. A better knowledge of the potential spawning areas and of the

duration of reproduction is needed, especially in the eastern Mediterranean and in the east Atlantic.

One of analytical methods which the SCRS currently applies requires abundance indices series to calibrate the VPA. These indices should be standardized and developed for a larger number of fisheries and especially for ages 3 to 7 fish for which CPUE series are not available.

The development of standardized biomass abundance indices is necessary to apply to the non-equilibrium production model for the tuna stocks. For east Atlantic bluefin, this method could improve its precision of analyses of the state of the stocks. The variability of catches in the different traps in operation on each side of the Strait of Gibraltar appears to be related to environmental phenomena which influence the migratory course of the tuna schools. The coastal countries at this area should develop series of catch data, with a fine time scale. In order to produce standardized indices, the real, original date of the capture should be considered, rather than the date the fish were killed, for nursery fish, after being caught by trap.

The Committee recommended detailed analyses of the effects of alternative substitutions of size composition information for fisheries for which size samples are limited or not available.

BFT-4E.c Management

The analysis carried out this year reflects similar patterns as in the 1990 analysis. In spite of uncertainties in the analysis it is apparent that higher long-term yields could be realized if fishing mortality rates were reduced, especially on young fish. The Committee is concerned by the high catch of small individuals and recommended that every effort be made so that the current measures on the size limit of 6.4 kg be adhered to. It is expressly recommended that steps be taken so that no age 0 fish (< 1.8 kg) are caught. Not respecting these recommendations could be highly detrimental to the future of the stock.

The Committee noted that in 1975, it was recommended that fishing mortality on bluefin tuna in the entire Atlantic and Mediterranean be limited to recent levels. Based on estimated F levels for young and oldest fishes, it is apparent that this recommendation has not been met.

BIL - B I L L F I S H E S

BIL-1. Description of Fisheries

Billfishes (Istiophoridae) are distributed throughout the tropical and temperate waters of the Atlantic Ocean. Blue marlin, white marlin, sailfish, and longbill spearfish are commonly caught by many fisheries, both directed and incidental, throughout their ranges. Black marlin landings from the Atlantic, if any, are negligible. Major catches of billfishes are incidental to the tuna and swordfish longline fisheries of many countries.

Other major fisheries are the directed recreational fisheries of the United States, Venezuela, Dominican Republic, Senegal, Costa Rica, Mexico, Jamaica, Bahamas, and Brazil. Smaller recreational fisheries also exist in Cuba, Bermuda, Portugal (Azores, Madeira), Côte d'Ivoire, and numerous other countries in the Caribbean Sea and eastern Atlantic. Artisanal fisheries for sailfish along the west African coast are becoming increasingly important, especially in Ghana and Senegal, but also in the Caribbean island country of Grenada. Artisanal fisheries for marlins and sailfish also exist in Côte d'Ivoire, Barbados, Brazil, Aruba, Curaçao, and in most other Caribbean island countries.

Recent development and geographical expansion of major longline fisheries in the Gulf of Mexico for tuna, Caribbean Sea for swordfish, and expansion of fisheries in the south Atlantic (south of 5°N) for swordfish have been reported by various nations (mainly Spain and the U.S. for the east and west Atlantic, respectively). Other countries that report expanding longline fisheries for swordfish in the Caribbean include Venezuela, Barbados, Grenada, and Trinidad. Development of industrialized longline fisheries using small diesel powered boats (11-14 m) and modern equipment, targeting yellowfin tuna, has also recently been reported in St. Vincent and Grenada. Because these regions are known to have significant concentrations of billfishes, incidental catches of these species can be expected to increase in areas of concentrated fisheries. The incidental nature of some billfish catches (mainly for the U.S. and Spanish longline fleets, and tropical purse seine fisheries of numerous countries) also results in discards which are difficult to document and result in uncertainties in the billfish catch statistics.

BIL-2. State of the stocks

The most recent stock assessments presented to the SCRS for blue and white marlin were in 1982; eastern Atlantic sailfish assessments were last presented in 1988. However, as a result of the work accomplished at the Second ICCAT Billfish Workshop in July 1992 (SCRS/92/16), updated assessments for blue and white marlin in the north, south, and total Atlantic were made and presented to the SCRS in 1992. Overall data preparations, assessment methods, and assessment results were presented in the Billfish Workshop Report, as well as in numerous 1992 SCRS documents. These are summarized below by species.

BIL-2.a Blue marlin

Total reported Atlantic landings of blue marlin (BIL-Table 1, BIL-Figure 1a) increased rapidly from 1960, reaching a peak of more than 9,000 MT by 1963. Landings generally declined until 1967 and remained relatively stable through 1977, fluctuating between 2,000 and 3,000 MT. From 1977 to 1979, landings declined to a somewhat lower level, fluctuating between 1,300 and 2,200 MT. During the last decade, landings have shown a general upward trend, particularly for the last three years, with fluctuations between 1,600 and 3,677 MT. The North and South Atlantic regions show trends similar to those for the total Atlantic. Most of these catches are incidental to the longline fisheries for tuna and swordfish; the general trends in catches have followed the intensity of these fisheries. It should also be noted that estimates of blue marlin (as well as other species of billfish) by-catch mortality in the U.S. longline fishery in the western Atlantic for 1989 through 1991 are considered under-reported. The east Atlantic tropical purse seiners' by-catch may also be significant, but these data have not been updated since 1983.

Production model assessments of Atlantic blue marlin presented to the SCRS in the early 1980's generally showed declines in the stock(s) biomass from the early 1960's to the mid-1970's, with some stabilization for the total Atlantic from the mid-1970's through 1980, but at values far below the 1965-75 average. These results suggested that blue marlin were at least fully exploited and likely over-exploited by 1980 or so. Concerns about the quality of the data base were stated in past SCRS reports. In addition, comparisons between recent abundance indices and earlier series based on Japanese longline catch and effort were not made in previous SCRS meetings because the recent effort component was not fully standardized for changes in fishing gear, fleet deployment pattern, and target species. However, these problems were addressed during the most recent Billfish Workshop. In addition to standardization of the Japanese longline indices for the north, south, and total Atlantic (BIL-Figures 2a, 3a, and 4a), standardization of CPUE series for the Taiwanese longline indices was accomplished for the north, south, and total Atlantic (BIL-Figures 2b, 3b, and 4b). Standardized indices for Venezuelan and U.S. recreational blue marlin fisheries were also prepared for the north Atlantic (BIL-Figures 2c and 2d), and Brazilian longline for the south Atlantic (BIL-Figure 3c). The Billfish Workshop also examined working documents with CPUE indices from Bermuda, Jamaica, Mexico, and the U.S. Virgin Islands, although the period covered by these series was short. Initial model runs at the Workshop included indices from Bermuda and Mexico but the final models in subsequent assessments only included the CPUE indices for a longer period listed above.

In general, trends in most of the CPUE series (i.e., Japanese, Taiwanese, and Brazilian longline, and Venezuelan recreational indices) for both stock hypotheses can be characterized as highest during the initial phases of exploitation, followed by declines to low levels, then stabilized at low levels during the most recent periods (BIL-Figures 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b). The time series for the U.S. recreational CPUE's started in 1972 (a period of stability in other indices) and remained relatively stable through the most recent period (BIL-Figure 2d).

The updated assessments include an additional 10 years of data compared to assessments carried out in the early 1980's and used a more flexible model (ASPIC). The current model does not assume equilibrium, and it allows analysis of several data series simultaneously. Because stock production models estimate relative levels of biomass and relative fishing mortality rates better than absolute levels, these data are illustrated in terms of ratios relative to optimal biomass (B_{msy}) and optimal fishing mortality rate (F_{msy}) estimates. Biomass (B_{msy}) is defined as the stock biomass that can produce MSY. According to theory, optimal fishing mortality rate (F_{msy}) results in MSY if the stock is at its optimum biomass level (B_{msy}). For each stock hypothesis (north/south and total Atlantic) an estimated trajectory for biomass (B/B_{msy}) and fishing mortality (F/F_{msy}) rate are

presented. The Billfish Workshop found no basis for choosing between the stock structure hypotheses, so the analysis was conducted on north/south as well as the total Atlantic. The first three years (1961-1963) are omitted from these figures since they are poorly estimated by the model.

Despite the differences between current methods and previous models, general results from the analysis for each stock hypothesis (BIL-Figures 5a, 5b, 6a, 6b, and 7a, 7b) suggest that biomass is below B_{msy} and in this respect the results are very similar to those of earlier stock assessments. The results for the north Atlantic are more optimistic than for other stock hypotheses and show signs of a modest recovery in biomass level in the last few years (BIL-Figure 5a and 5b), although estimated biomass is below that which could produce MSY. Conversely, results for the south Atlantic and total Atlantic (BIL-Figures 6a and 6b now, 7A and 7B) are less optimistic, with continuous decreases in biomass levels toward the end of the time series in the south Atlantic. Under the total Atlantic stock hypothesis, biomass appeared to stabilize in the last few years.

The recent Billfish Workshop (Miami, July, 1992) considered that these results were tentative and recommended an evaluation of the effect of changes in assumptions on the results of the analyses. The Workshop was particularly concerned about the accuracy and completeness of landings and effort data. Following Workshop recommendations, the Committee made numerous sensitivity runs to gain insight into how under-reporting of landings data (25 percent and 50 percent for all years) affect assessment results for the north Atlantic and total Atlantic. These results are given in BIL-Figures 5c and 5d, and 7c and 7d. As expected, proportional increases in estimates of MSY were observed (BIL-Table 5) but the estimated trajectories of B/B_{msy} and F/F_{msy} for the north and total Atlantic did not change in pattern for the 25 percent and 50 percent scenarios tested here. Because the Working Group felt that the probability of under reporting was highest in the most recent portion of the time series, the Committee also tested the effect of a hypothetical 25 percent underestimates of catch for 1976 through 1989. Results of these patterns of sensitivities were very similar to previous findings (BIL-Figures 5a and 5c and BIL-Figures 7a and 7c) but proportional increases in estimates of MSY were observed (BIL-Table 5). Because sensitivity runs for the north and total Atlantic showed no change, sensitivity analysis for the south Atlantic was not conducted.

Although the sensitivity analyses described above indicate that model results are reasonably insensitive to under-reporting of catches, the Committee is still concerned about the quality of the data, particularly landings reported as an incidental catch. Despite these uncertainties, the Committee was encouraged by the large increase in available information resulting from the 1992 Billfish Workshop and by the updated assessments that resulted. The most recent assessments included ten more years of data, and benefitted from the application of methodology which allowed multiple abundance index series to be incorporated into the analysis. No longer does the assessment rely exclusively on the Japanese longline data base, which represents a reduced proportion of the total catch in recent years. These factors, no doubt, provide a much improved view of the status of the stock(s).

The assessment results indicate that stocks remain well below B_{msy} levels and most recent estimates of F remain above F_{msy}. As a result of the updated assessments (using ASPIC), as well as previous assessments, the Committee believes these stocks are over-exploited. For the north Atlantic stock, the apparent stabilization in some standardized recreational CPUE's over the past decade (U.S. and Venezuela) and production model results showing signs of a modest recovery during the most recent years, are encouraging. However, the continued decline of estimated biomass in the south Atlantic and stabilized but low levels of B/B_{msy} in the total Atlantic, which have occurred for over two decades (BIL-Figures 6a and 7a), reinforce and expand concerns expressed by past Committees. In particular, the Committee is concerned about the continuing high level of fishing mortality which has depressed stock biomass to levels below that which could produce MSY in most stock hypotheses examined here.

BIL-2.b White marlin

Landings reported from the total Atlantic (BIL-Table 2, BIL-Figure 1b) increased rapidly from 800 MT in 1961 to almost 5,000 MT by 1965 and then gradually declined to 900 MT, with fluctuations, during the following 15 years. Landings during the last decade have been comparatively stable, fluctuating between 958 to 1,676 MT.

As was the case for blue marlin, white marlin stock assessments have not been presented to the SCRS since the early 1980's. Those early assessments generally showed a sharp decline in the stock(s) biomass from the early 1960's through 1970, with continued but more moderate declines (with variation) to low levels through 1980. The stock(s) were considered to be at least fully exploited and likely over-exploited by the later part of this time series (mid to late 1970's). Concerns about the quality of data stated previously for blue marlin were also expressed for white marlin. Japanese longline CPUE indices from 1977-86 were presented to the 1988 SCRS (BIL-Figure 3a) but as with blue marlin, these values were not compared to the earlier series due to changes in fishing practices. As a result of the work achieved at the 1992 Billfish Workshop, standardization of effort for deep longlining was accomplished for the Japanese longline indices. Standardized Japanese longline indices for north, south, and total Atlantic; Taiwanese longline indices for north, south, and total; Venezuelan and U.S. recreational indices for the north Atlantic; and Brazilian longline indices for the south Atlantic (BIL-Figure 8a-d, 9a-c, and 10a-b) were developed or considered at the Workshop. The Billfish Workshop found no basis for choosing between north/south and total Atlantic hypotheses, so the analysis was conducted for both hypotheses.

In general, white marlin indices were highest at beginning of the time series and declined to historic lows at the end of the time series, for each fishery and region. These declining trends were all very similar, although the magnitude of the decline and the year of steepest decline varied between fisheries and north, south, and total Atlantic regions (BIL-Figures 8a-d, 9a-c, and 10a-b). The only exception to this, was the trajectory shown by the Brazilian longline index for the south Atlantic (BIL-Figure 9c), which had highest CPUE's in 1972, sharp declines to historic lows by 1979, and then increased and decreased again by the end of the series.

The differences between early assessments (1979-82 SCRS) and those presented to the 1992 SCRS, in terms of methodology and available data, for white marlin are the same as stated previously for blue marlin. Analysis using a non-equilibrium production model (ASPIC) were initially conducted for the entire time series 1961-1990. However, the north Atlantic model would not converge to a solution, due to the large variation in CPUE's during the first five years. Therefore, the data were considered from 1966-91 and the model again applied (this was also done for the total Atlantic model). The general results from the analysis for each stock hypothesis (BIL-Figures 11a-c and 12a-c) illustrate declines in stock biomass to levels well below estimated B_{msy} and corresponding increases in fishing mortality above estimated F_{msy}. The north Atlantic stock results showed a slight upswing in estimated biomass and a downturn in estimated fishing mortality in the last few years (BIL-Figure 11a and 12a). However, the Committee interpreted this as a slowing of the downward trend in biomass and not as a sign of recovery. White marlin results in this case were less optimistic than for blue marlin in the north Atlantic. Also, since the first five years of data, which include the largest declines in CPUE's (BILL-Figures 8 and 9), could not be used in the north and total Atlantic models, these results could be considered conservative. Results of the current white marlin assessments are consistent with those presented to the SCRS in the early 1980's, and indicate a decline in the stock status since the mid to late 1970's.

The Committee conducted numerous sensitivity runs, as recommended by the Billfish Workshop, to gain insight into how underestimates of landings (25 percent, 50 percent for all years, 25 percent for 1976-1990) might affect assessment results. Under all of these hypotheses, proportional increases in estimates of MSY were observed (BIL-Table 6) but the trajectories of B/B_{msy} and F/F_{msy} for the north and total Atlantic were virtually unchanged (BIL-Figures 13a-b and 14a-b). Because sensitivity runs for the north and total Atlantic showed no change, sensitivity analysis for the south Atlantic was not conducted.

The Committee noted that the median annual estimates of B/B_{msy} for the south Atlantic stock bootstrap results (BIL-Figure 11b) was consistently below the estimated level which could produce MSY, although estimates of this ratio were very imprecise in the earliest part of the time series. The Committee found no evidence of bias in the bootstrap results.

Many consistent patterns emerge when the assessment and sensitivity runs are examined. For example, all models estimate that for decades stock biomass has been below that which could produce MSY (B_{msy}). All models also estimate that fishing mortality rates are too high to allow a rapid recovery to B_{msy}. For the south Atlantic and total Atlantic hypotheses, the fishing mortality rates are far too high to allow any recovery. As a result, the Committee considers these stocks to be overexploited.

The Committee felt that in spite of remaining uncertainties about the data base, substantial increases in available information and refinement in assessment methodology (compared to previous assessments) resulted in improved assessment of the current status of white marlin stock(s), as was the case for blue marlin. The Committee is particularly concerned about the depressed state of white marlin biomass and the high levels of fishing mortality, which has been continuing for about two decades.

BIL-2.c Sailfish /spearfish

Landings reported for the total Atlantic (BIL-Table 3, BIL-Figure 1c) increased from about 300 MT in 1960 to almost 3,000 MT by 1965. Landings fluctuated between 1,900-2,500 MT through 1969, increased to over 2,700 MT the next two years, and then declined to less than 2,000 MT by 1977. Landings increased again to about 3,300 MT by 1979, fluctuated between 2,000 to 2,500 MT in 1980-82. Landings peaked at over 3,600 MT in 1983 and then declined continuously to about 1500 MT by 1991. Unclassified landings of sailfish are given in BIL-Table 4. An analysis of eastern Atlantic sailfish presented during the 1988 SCRS strongly suggested that Task I data represent an underestimation of landings for several important longline fleets. These problems may also affect the statistics for other species of billfishes, as discussed previously for blue and white marlin. The long-standing problem of separating sailfish from spearfish landings from offshore longline fisheries of many countries remains unresolved. However, some of the database problems were addressed at the 1992 Billfish Workshop. For example, sailfish Task I data from Japanese (1961-1990) and Taiwanese (1967-1979) longline fisheries that had previously been reported for the total Atlantic were broken down into east and west Atlantic, using average size, and converting the number of fish to weight. Despite these improvements, these data should still be considered provisional until problems are further clarified.

West Atlantic

There were no new analyses presented on the status of the stock this year. Updated standardized CPUE's from the Venezuelan recreational fisheries were submitted to the 1992 Billfish Workshop but a stock assessment of this species could not be conducted because of time constraints. The Venezuelan recreational indices increased rapidly to a peak in the early 1970's, followed by a sharp decline between the early 1970's and the late 1970's, and then remained relatively stable with some fluctuation from the late 1970's to 1990, but at low levels of CPUE (BIL-Figure 15a). The seasonality of monthly nominal CPUE's for sailfish from the U.S. longline fishery in six areas of the western Atlantic Ocean (1987-1990) were presented to the 1991 SCRS. New nominal CPUE indices were presented to the Billfish Workshop from Mexico (BIL-Figure 15b) and indicated a trend similar to the Venezuelan index, with highest values in the early 1970's and a sharp decline towards the end of the series in 1990. Nominal CPUE's for the Brazilian longline fisheries in the southwest Atlantic (BIL-Figure 15c) were presented to the 1992 SCRS and also had similar trends to Venezuelan and Mexican indices. Highest Brazilian CPUE's were observed at the beginning of the time series with historic lows at the end of the time series. Previous assessments (SCRS 1982) of the status of this resource indicated this stock to be moderately exploited. The Committee is concerned about the downward trend in CPUE indices for west Atlantic sailfish since the previous assessments, which may indicate substantial decline in biomass from the levels of the early 1970's. With additional CPUE series presented at the Workshop, the Committee felt that further stock analysis might be possible in the near future, which would allow more definitive conclusions on the status of the stock.

East Atlantic

No new stock assessments for east Atlantic sailfish were presented to the 1992 SCRS. The most recent equilibrium assumption production model results, i.e., those presented to the SCRS in 1988, suggest that the coastal east Atlantic stock of sailfish is not yet fully exploited. Results of a cohort analysis conducted at the same time were not conclusive because of uncertainties with recruitment trends and since there was a need for improved quality of the data before more definitive stock evaluations can be made.

The most recent Japanese longline sailfish CPUE indices for the central and east Atlantic fishing grounds were those presented to the 1988 SCRS. These indices

indicated a steep declining trend from the late 1960's to the mid-1970's, followed by a more gradual decline through 1986. However, unlike blue and white marlin, these data are not completely standardized for changes in gear deployment, and interpretations may need to be clarified once this is accomplished for sailfish. Japanese and Taiwanese longline catches of sailfish were re-evaluated at the recent Billfish Workshop. This re-evaluation resulted in changes in the assigned catch levels from the east and west Atlantic which need to be incorporated into any updated analyses. Standardized recreational CPUE from Senegal that were presented to the 1988 SCRS indicated stable tendencies from 1970-1980 (in the same fishing zone as the Japanese indices), then showed gradual declines through 1986. The Committee noted that Senegalese recreational data also need to be interpreted with caution because of potential interactions with the artisanal fishery for sailfish in Senegal, which occurs at the same time, and results in higher catches of sailfish. These factors may contribute to the downward trend in recreational CPUE for this fishery during the most recent years (1987-1990). The CPUE indices from the Senegalese artisanal fisheries were presented at the 1992 Billfish Workshop (BIL-Figure 16a). These showed a continuous increase in CPUE's, particularly during the most recent years (1986-91). Nominal CPUE's for the artisanal fisheries from Ghana were also presented at the 1992 Billfish Workshop. Although these CPUE's are for all species of billfish combined, sailfish represent over 80 percent of the total, and a moderate decline, which stabilized in the last three years, was shown from 1984 to 1991 (BIL-Figure 16b).

The Committee is encouraged by the increase of information on east Atlantic sailfish. After this information is updated and analyzed further for complete standardization of each CPUE series, and corrections of the landings and effort statistics are made, an improved assessment for this species should result.

BIL-3. Effects of Current Regulations

No ICCAT regulations are currently in effect for billfishes. However, two ICCAT Contracting Parties (the U.S. and Venezuela) and one non-Contracting Party (Mexico) established domestic regulations involving Atlantic billfishes in 1988 and 1990-91. Venezuela initially prohibited commercial fishing in the area of La Guaira in 1988 and in 1990, and stricter regulations were established to minimize Venezuelan recreational landings of billfishes and prohibit their sale. In addition, Mexico prohibited commercial longliners within 50 miles of her coast in 1990 and revised billfish regulations to eliminate the commercial sale of billfish in 1991. The 1988 regulations in the U.S. have affected billfish landing statistics (number and size of fish landed) in the commercial longline fisheries for tuna and swordfish by eliminating possession and sale of billfish. These changes are presented in the 1990-91 U.S. National Reports and in various SCRS documents presented in 1990 and 1991. In addition, regulations on minimum size for each species were also established for the U.S. recreational fishery in 1988. Volunteer release policies for U.S. recreational billfish tournaments, as well as for the recreational billfish fisheries of Venezuela, Jamaica, Mexico, Brazil, and Bermuda have progressively increased over the last decade and have no doubt helped to reduce fishing mortality from this segment of the fishery.

BIL-4. Recommendations

BIL-4.a Statistics

The Committee recommended:

i) That accurate estimates of total landings (Task I data) caught by all types of gears be made, by species, for Atlantic blue marlin, white marlin, and sailfish. In addition, billfish landing records from non-Contracting Parties, that do not normally report to ICCAT, should be obtained.

ii) That catch, effort, size statistics and, if possible, landings by sex from all countries be reported by five-degree area and by month, as outlined in the ICCAT sampling instructions for billfish (SCRS/88/-28).

iii) That catch statistics for sailfish and spearfish, particularly from offshore longline fisheries, be reported separately in order to facilitate stock assessment of both species.

iv) That sailfish/marlin discards for historical longline and purse seine fisheries, as well as more recently

developed fisheries, be evaluated and updated, especially for those fisheries catching swordfish in the Gulf of Guinea.

BIL-4.b Research

The 1993 Program Plan for the Enhanced Research Program for Billfish (Appendix 10 to Annex 14) describes the general areas of recommended research. Many of the specific task assignments proposed for the 1992 Billfish Workshop (SCRS/92/16) were accomplished for marlins but not for sailfish (these included elements for both research and statistics). Research emphasis for these tasks should now be placed on west and east Atlantic sailfish. General recommendations of the Committee include but are not limited to the following:

i) Age and growth studies of marlins and sailfish be continued. Active sampling of juvenile marlin and sailfish should be continued.

ii) Commercial and recreational fisheries data for billfishes (particularly sailfish) be analyzed to develop standardized abundance indices. This is particularly important for the offshore longline fisheries, so that relationships between present abundance of sailfish and that for the 1969-75 period can be evaluated. In this analysis, gear type, gear deployment, and target species should be taken into account.

iii) Full implementation of the ICCAT billfish tagging program will require special efforts regarding tag-recaptured fish. These efforts have been effectively applied in Venezuela using prompt payment of rewards and tag recapture cards distributed by the U.S. National Marine Fisheries Service. These cards are printed on fluorescent orange stock and should be developed to enhance ICCAT Atlantic wide tag recapture efforts. All ICCAT Contracting Parties and reporting nations are encouraged to make a special effort to distribute tag-recapture posters, particularly the Japanese, Chinese, and Portuguese translations, to the larger offshore longline vessels, so tag recapture data and biological samples can be recovered by ICCAT. Tag release as well as tag recapture efforts in Brazil and in the eastern Atlantic off Senegal should be enhanced.

iv) The intensity of studies on the reproductive biology of billfishes in the east and west Atlantic needs to be continued and expanded. This will require analysis of data collected in the past, as well as obtaining new information.

v) Initiate telemetry studies to evaluate the short-term survival of blue and white marlins caught and released from longline vessels.

vi) Initiate studies to investigate possible alternative gear and deployment schemes that could reduce fishing mortality of marlins from longline fisheries targeting other species.

BIL-4.d Management

Recent stock assessment results for blue and white marlins, which indicate that both species are overexploited, warrant consideration for development of methods to reduce fishing mortality rates on billfish at this time. Development of effective management measures for these stocks is particularly difficult, since the major portion of the landings is a result of offshore longline fleets targeting tuna and swordfish. Thus, any mortality reduction measures implemented for marlin risk affecting the targeted species as well. However, since available information suggests that about 43 percent of the white marlin and 37 percent of the blue marlin brought along side longline vessels appear to be alive, releasing these may be one mortality rate reduction approach that could reduce the currently high rates of fishing mortality without affecting landings of the target species. The Committee believes that such an approach would first have to be implemented on an experimental and selective basis while additional research is conducted (perhaps telemetry studies) to determine the rate of survival of marlin caught and released off longline vessels. If the short-term survival of marlin released from longline vessels is sufficiently high, then this approach, in combination with an observer program, may be one practical method for reducing fishing mortality on these species.

In light of the recent assessment for blue and white marlins presented at the 1992 SCRS, the Committee recommended that the fisheries for billfishes be monitored closely.

SWO - S W O R D F I S H

INTRODUCTION

Swordfish are distributed widely in the tropical and temperate waters of the Atlantic Ocean and Mediterranean Sea. They are believed to spawn in the warm waters of the Atlantic and in the Mediterranean Sea. Total swordfish catches (Atlantic and Mediterranean) peaked in 1989 at 51,188 MT and declined by 25 percent to 38,408 in 1991.

ATLANTIC

SWO-ATL-1. Description of Fisheries

Total Atlantic catches of swordfish reached a historic high of 33,426 MT in 1989 and have declined by 24 percent to 25,457 MT in 1991 (SWO-Table 1 and SWO-Figure 1). Swordfish are taken throughout the Atlantic by directed fisheries and as a by-catch of the tuna longline fisheries. The Japanese tuna fishery starting in 1956 has operated throughout the Atlantic (SWO-Figure 2). Directed longline fisheries in Canada, Spain, and the United States have operated since the late 1950's or early 1960's, and harpoon fisheries have existed since the late 1800's. There are other directed swordfish fisheries (i.e., Portugal, Venezuela) and by-catch fisheries which take swordfish (i.e., Brazil, Taiwan, Uruguay).

In the north Atlantic, the directed swordfish fisheries on both sides of the ocean have operated primarily by deploying longlines at night. Minor catches are attributed to the driftnet, harpoon, and trap fisheries. Since the mid-1980's, the U.S. and Spanish longline fleets have extended their operations offshore, and now overlap in the central north Atlantic (SWO-Figs. 3 and 4). North Atlantic catch and effort for swordfish increased continuously after 1978 when U.S. mercury standards were revised. Since the historic high of 19,959 MT in 1987 (SWO-Table 1 and SWO-Figure 1), the catch has declined 34 percent to 13,212 in 1991. This has been at least partially attributed to a significant shift of Spanish effort to south of 5°N starting in 1988.

Since 1988, the Spanish longline fishery has expanded its fishing grounds towards the south and southwest, as far as the Gulf of Guinea (SWO-Figure 2). More than 50 percent of Spanish landings (in weight) are from south of 5°N. In the southwestern Atlantic, South American longline fisheries target either swordfish or tunas, depending on the relative catch rates. Total catches in the south Atlantic, were relatively low (generally less than 5,000 MT) until the early 1980's. Since 1988, reported landings have exceeded 10,000 MT, reaching a peak in 1989 (16,418 MT). This was followed by a 25 percent decline to 12,255 MT by 1991, due in part to a shift of part of the Spanish fleet to the Pacific in 1990 and 1991, and to a reduction in Japanese catches.

SWO-ATL-2. State of stock

SWO-ATL-2a. Stock structure

In 1991, swordfish stock structure was reviewed (see SWO-Figure 20) and analytical priorities were established. Taking into account the stock structure information (SWO-Table 2; SWO-Figure 5), concerns expressed in the 1991 SCRS management recommendations regarding increasing catches in the south Atlantic, available new information, and time limitations, major analytical efforts were focused on the north Atlantic (north of 5°N, not including the Mediterranean), followed by the south Atlantic (south of 5°N), and the Mediterranean (see SWO-Figure 20).

It was noted that the Canadian mtDNA study (SCRS/91/48) has continued with samples from seven areas including: three south of 5°N, three in the northwest Atlantic and one in the northeast Atlantic.

SWO-ATL-2.b Catch at size/age

The Secretariat proposed updating the catch-at-size data base by seven major sampling areas (1-3, 4A, 4B, 6-7) of the Atlantic up to 1991 (SCRS/92/9), including substitutions for the catches that have no matching size data, and raising them to the catch.

The SCRS noted major data improvements as a result of the Data Preparatory Meeting on Southwest Atlantic Tuna Fisheries (Recife, Brazil, July 1 to 7, 1992). The Brazilian longline catches are now separated by base port and many new sets of size data became available to match with these catches. Since the catch composition differs between fleets, these improvements are important. Venezuelan size data

became available for recent years through the observer program of the Enhanced Billfish Research Program. These data (1987-1992) were used for sizing the Venezuelan catches.

On the other hand, size data were not available for recent years for the Taiwanese longline fleet, the Portuguese fleets and French gillnet catches.

After reviewing the proposed data matching, substitutions and raising, the Committee approved the procedure.

The catch-at-size data were updated during the session and were further aged using the traditional age slicing method. Further discussion on ageing the size data can be found in subsequent sections of the report. The catch-at-age tables are given in SWO-Tables 3 and 4 for the north and south Atlantic, respectively, by major fisheries.

SWO-ATL-2.c. Catch rates

The Committee examined catch rate information from the Japanese (SCRS/92/41), Spanish (SCRS/92/43), and U.S. (SCRS/92/117) longline fisheries. The Committee also examined catch rate information used to develop a biomass catch rate index from the U.S., Canadian, Japanese, and Spanish data sets (SCRS/92/28). The Committee noted that although standardized catch rate information from the Japanese and Spanish fleets operating in the south Atlantic had become available, standardized series from other nations catching swordfish in the south Atlantic waters are still not available. Information from and participation by national scientists familiar with the major fleets operating in the south Atlantic are critical for standardizing abundance index series for assessments of the status of the south Atlantic swordfish resource.

Standardized indices of abundance by age were provided in the documents identified above. The Committee also attempted to develop age-specific indices of abundance from the Spanish and U.S. longline data sets after application of an alternative ageing technique ("Kimura-Chikuni"), as recommended last year. Details are provided in the "Record of Analyses".* The indices which were developed using "Kimura-Chikuni" were more variable than those developed by the age-slicing method used for previous assessments. These indices were found to have undesirable statistical properties. Inconsistencies associated with the "Kimura-Chikuni" ageing method were identified during the meeting and are discussed in the "Record of Analyses". These inconsistencies may be the cause of the undesirable statistical properties in the indices found in due course. Because of this, the Committee recommended that further research be made on the method before considering the approach of a better option than the current age slicing method used.

All of the standardized indices considered for use in VPA tuning and non-equilibrium stock production modelling for the north Atlantic stock hypothesis are shown in SWO-Table 5. In general, the trends of these indices are similar, although the Committee noted that there are some differences. The available age 1 indices from Spain and the U.S. show different tendencies in the 1991 value relative to the 1990 value. A minimum size regulation, in conformity with the ICCAT recommendation for a 25 kg minimum size, was implemented in the U.S. in the latter half of 1991, which would tend to cause a decrease in the CPUE for fish less than the minimum size, since the analyses are based on numbers of fish caught and landed. For this reason, the U.S. CPUE analysis was based only on data collected through the first half of 1991, during which period U.S. regulations (catch limits and minimum size) were not yet in effect. Standardized catch rates of age 1 fish in the U.S. data set analyzed in this fashion show an increase in 1991, in contrast to the catch rate level from the Spanish fleet. The available age-specific standardized indices for the entire north Atlantic stock hypothesis are plotted in SWO-Figure 6.

As in the previous report, the Committee noted that it is possible that changes in age-specific catchability, which are not detected in the present models used to standardize CPUE, could cause variation in stock assessment results. It is not clear what degree of variation would be imposed, since this depends on the degree and direction of change in age-specific catchabilities, if any. Increasing catchability that might not be controlled for in the analyses of age-specific CPUE's causes overly optimistic views of age-specific trends. Conversely, decreasing catchability that might not be controlled in analysis could cause somewhat

*The "Record of Analyses" will be submitted as an SCRS document at a later time.

pessimistic views of trend. Although it is possible that one or both kinds of change in catchability could have occurred in the various swordfish CPUE series, the extensive residual pattern analyses conducted to date have not identified any strong indications of trends in catchability over the time series studied. However, further study is needed to evaluate additional factors ("micro scale" changes, bio-economic and other factors).

SWO-ATL-2.d. Population parameters

No new information was provided to the Committee that would allow selection of alternative growth rates. Thus the previously adopted mark-recapture Gompertz equation was used. The updated catch-at-age table is similar to previously developed tables. The Committee considered sources of error in developing catch at age because of the monthly age slicing process which assumes no overlapping age-length distributions. Alternative procedures incorporate frequency distributions and overlap by length and age and sex. The Committee reviewed SCRS/-92/115 and SCRS/92/27 which used length-based methods to develop an alternative catch-at-age matrix. The use of information on age-class size distributions and overlapping cohorts may provide a catch-at-age matrix which more realistically tracks fluctuating age-class strengths. The age slicing procedure will tend to reduce the strength of strong year-classes by classifying members of that cohort into adjacent cohorts. Additionally, the alternative methods allow the possibility of incorporating sexual dimorphism into the process of estimating catch at age.

The Committee considered that it is essential to evaluate the degree of overlap between adjacent cohorts prior to ageing the catch and developing abundance indices by this method. Therefore, the Committee strongly recommended that an intersessional meeting be held to address appropriate size/age conversion methods for swordfish and other tunas of interest to the SCRS.

The Committee reviewed reports updating sex/ratio-at-size data and maturity data for the north Atlantic (SCRS/92/111 and SCRS/92/112). The sex-ratio-at-size data by area are becoming more complete, such that initial estimations of sex-specific catch at size may be possible for some periods. However, the Committee concluded that the separation of catch at size into catch at size by sex was limited by the time-area characteristics of the available data, particularly in the early years. The Committee felt that the season-area dynamics of sex ratio-at-size data was an important biological characteristic that should be incorporated into any method used for separating the catch by sex. The Committee reiterated concerns that applying an aggregate sex ratio-at-size pattern could have a potential smoothing effect on the catch at age. The Committee was not confident in creating catch at size for each sex by major areas and years. The available sex-at-size data were not sufficient in quantity for a major portion of the catch to allow reliable separation of catches by sex and size. Progress has been made in collecting size information by sex in the past few years and expanded observer coverage could improve collection of these valuable data.

Additional analyses of reproductive data (gonad maturity) were presented. Initial results indicated the possibility of spawning in the winter months between 18°N and 35°N, west of 60°W, in the northwest Atlantic. Percent maturity at size is consistent with previous studies.

SWO-ATL-2.e Stock-production model

The 1990 SCRS Report recommended application of production models for swordfish stock assessment. This type of model has been applied to a wide range of species, from anchovy to marine mammals. At the 1991 SCRS meeting, a non-equilibrium production model was applied to north Atlantic swordfish (SCRS/91/46). The available data would not permit simultaneous estimates of all model parameters and so some parameters were fixed and a series of runs were made. Estimates of MSY, conditional on the fixed parameters and other assumptions made for the model, were in the range of 13,100 to 14,300 MT.

Another form of non-equilibrium production model (ASPIC) was used by SCRS in 1991 to analyze statistics on yellowfin tuna. The ASPIC model has been presented to the SCRS in working documents in 1991 and 1992. Application of ASPIC to the 1991 swordfish biomass index (SCRS/92/113) resulted in estimates of MSY that were comparable to those of 1991 analyses. However, because of the limitations of the data set, not all of the model parameters could be estimated simultaneously. Like the estimates made in 1991, the MSY estimates resulting from application of ASPIC to

last year's data are conditional on the assumptions made in applying the model.

ASPIC was applied (SCRS/92/114) to a preliminary preliminary version of a revised biomass index of abundance. Those data (SCRS/92/28) included additional years (1962 to 1970) and data from Canada and Japan. It was possible to estimate all model parameters from this enlarged data set. Because of this, fewer assumptions were needed in estimating MSY with this data set.

The group made six ASPIC runs for assessment purposes. The results of these bootstrap runs estimated that the MSY value for the base case was biased downward. During the SCRS Plenary Session, the estimates from these runs were reviewed and adjusted by a procedure that corrects for this estimation bias (SWO-Table 6). The resulting estimates were more optimistic in terms of MSY and relative biomass level. The base case run used all available data, and five additional runs examined model sensitivity to omission of a year's index data or a few years' index data, as detailed in the footnotes to SWO-Table 6. The adjusted base case estimate of MSY was 14,200 MT. A number of sensitivity analyses were conducted to address concerns about different parts of the data series and the fisheries from which the data were obtained. The adjusted results of these six runs (SWO-Table 6) showed that by omitting certain years' data one would obtain MSY estimates from 14,300 MT to 15,200 MT and estimates of the ratio B_{92}: B_{MSY} from 84% to 95% (where B_{92} is the biomass at the beginning of 1992).

The adjustment described above was suggested at the SCRS plenary session by Japan and by an observer from the IATTC. Because the adjustment was made after the stock assessment session, it was not possible to examine it with sensitivity tests, although the Committee did apply such tests to other aspects of the assessment analyses.

After extensive discussion, the Committee decided to use only the base case in subsequent analyses, since no objective criteria had been set for exclusion of outlier prior to the initial run with the entire time series. Results of the subsequent analyses are conditional on the assumption that the base case is an accurate reflection of north Atlantic swordfish stock dynamics. Results of the base case indicated a good fit between observed and predicted fishing effort (SWO-Figure 7). The estimated standard error of MSY from 300 bootstrap trials was 2,600 MT (SWO-Figure 8, SWO-Table 6).

Optimum effort f_{MSY} is defined as the rate of fishing effort at which the maximum sustainable (equilibrium) yield (MSY) can be obtained, provided that the stock biomass is at its optimum level B_{MSY}. The estimate of f_{MSY} was 71.6 M hooks/year with an estimated standard error of 12.9 M hooks/year. From the CPUE index, 1991 effort was estimated at 69.9 M hooks/year, but the model suggests that effective effort may have been higher (SWO-Figure 7).

The production-model theory states that MSY can be taken as a sustainable yield only when the stock biomass is at a certain intermediate level represented by B_{MSY}. The actual stock size in any year depends on the history of exploitation, but of course may be above or below B_{MSY}. Stock-size estimates from production models are often presented in relation to B_{MSY}, as this practice increases precision and provides a management reference point. Each of the six runs (SWO-Table 6) on north Atlantic swordfish estimated a declining stock biomass in recent years. In the base case (SWO-Figure 9, SWO-Table 6), the estimate of stock biomass at the start of 1992 (B_{92}) was 84% of B_{MSY}, with an estimated standard error of 19 percent.

The most optimistic sensitivity case examined in terms of the estimate of 1992 biomass relative to B_{MSY} (SWO-Table 6: Run SWO-4) gave an estimate of B_{92} to be 95 percent of B_{MSY}; while the most pessimistic sensitivity case examined (SWO-Table 6: Run SWO-3) resulted in an estimate B_{92} to be 85 percent of B_{MSY}. These results imply that the sustainable yield presently obtainable from the stock is probably lower than the sustainable yield that could be realized at a higher level of stock biomass. Column (5) of SWO-Table 6 presents estimates of sustainable yield that correspond to each run's estimates of MSY and B_{92}. Because B_{92}/B_{MSY} is estimated to be less than unity, these equilibrium yields are below MSY. The Committee expressed concern that the catch statistics prior to 1978 are probably less accurate than those in more recent years. This needs to be addressed to try to reduce the bias in the estimates.

SWO-ATL-2.f. Virtual Population Analysis (VPA)

Virtual population analysis (VPA) was conducted under the north Atlantic stock hypothesis. Again this year, the VPA was calibrated to a suite of abundance indices (derived from standardized catch rates) using the ADAPT framework. The ADAPT framework has

evolved considerably since it was first used by the SCRS (for bluefin tuna assessment) in the mid-1980's. However, the Committee again finds that application of this framework provides a useful mechanism for integrating the sometimes dissimilar data and biological information that are typically available for many assessments.

The Committee calibrated the VPA using eleven indices of abundance. Indices for ages 1, 2, 3, 4, and 5+ were derived from the U.S. and Spanish longline catch-effort data using the GLM approach (SCRS/-92/117, SCRS/92/43 and SWO-Figure 6). Another index for ages 5+ was derived from the Japanese longline fishery (SCRS/92/41 and SWO-Figure 6).

The Committee noted that catches of age 0 fish occur (SWO-Table 7) and in some years these catches were large.

As with previous assessments, the Committee examined alternative hypotheses regarding biological and/or fishery characteristics that could influence the assessment results and perception of stock status (e.g., truncation of index series and evaluation of large fish selectivity).

After discussion and examination of results, the Committee reached a consensus regarding an acceptable VPA run. This model assumed flat-topped selectivity for ages 5+, which was constant over all years, while the selectivity for younger ages was estimated within the model. All eleven indices of abundance were used in the calibration. Each index was weighted by the inverse of its variance (i.e., indices with greater precision received more weight). The full time series of years for which catch-at-age data are available (1978-91) were used in the model.

Results of the VPA indicated that:

1) Stock size estimates at the beginning of the year of age 1 swordfish (recruits) increased gradually from 1978 through 1987 (SWO-Table 7, SWO-Figure 10), re- mained at the same level in 1988, and increased in 1989 and declined in 1990. The 1990 year-class (i.e., age 1 fish in 1991) may be considerably higher than in previous years, but the estimate is very uncertain. The 1991 year-class may be smaller than in recent years, but the estimate of this is even more uncertain. Stock size of the ages 2-4 juvenile group increased throughout the 1978-87 period and has been variable since then. The age 2-4 stock size at the beginning of 1992 increased substantially due to the calculated increase in the 1990 year-class. Adult stock size (ages 5+) declined continuously throughout the time series to approximately half of what it was in 1978. There was a small increase in the estimated abundance of age 5+ in 1992.

2) The fishing mortality rate (F, see SWO-Figure 11) of age 1 and the ages 2-4 group fluctuated, but with a generally increasing trend through 1988, with a constant decline in 1989-1991 (SWO-Table 7). F on ages 5+ appears to have increased significantly during 1978-87 with a gradual decline from 1988 to 1991. The weighted average F estimated for ages 2-5+ in 1991 is 64 percent of the 1988 level and 141 percent of the 1978 level.

In 1991, the Committee noted that selectivity for older fish could not be determined from available data. Recent changes in methods of operation and fishing areas have increased the catches of larger fish, suggesting that the availability of these fish to standard surface longline may have been lower, particularly in the past. The Committee still has no data with which to measure any decline in availability (i.e., reduced selectivity after age 5), if it is present. However, the directional impact of such an assumption was tested in two ways: (1) by estimating the F ratio (ratio of fishing mortality rates of age 5+ to that of age 4) in two periods of time prior to 1992; and (2) by assuming a constant F ratio of 0.75 for all years. The former allows for selectivity patterns within the 5+ group to change over time, whereas the latter assumes a decrease in selectivity within the 5+ group that is constant from 1978-91. The resulting trend in stock size (1978-1991) of the age 5+ fish using these two tests was similar to that obtained assuming equal availability (Table SOUT.0A and Table SOUT1.DM in the "Record of Analyses"). When selectivity was allowed to change over time, the point estimate of age 5+ stock abundance at the beginning of 1992 was 8 percent lower and the fishing mortality rate point estimate was 37 percent higher than comparable point estimates for the flat-topped selectivity assumption. The F on ages 2-4 in 1991 were within 1 percent. Conversely, when selectivity was fixed at an F ratio (F5+/F4) at 0.75, the point estimate of age 5+ stock abundance at the beginning of 1992 was 21 percent higher and the fishing mortality rate point estimate was 27 percent lower than comparable point estimates for the flat-topped selectivity assumption. The F on ages 2-4 in 1991 was within 1 percent.

As discussed in 1991, concern was again expressed regarding the applicability of the CPUE indices in the years prior to 1983. For comparative purposes, a VPA was run restricting all indices truncated to the 1983-1991 period. The resulting trend in stock size (1978-1992) of the age 5+ swordfish was similar to that obtained using the full CPUE data sets (Table SOUT1.TR in the "Record of Analyses"). However, the point estimate of age 5+ abundance estimated at the beginning of 1992 was 2 percent lower and the point estimate of the fishing mortality rate was 1 percent higher than the comparable point estimates from the run with the full time series of CPUE. The F on ages 2-4 in 1991 increased 9 percent.

As was done in 1991, a retrospective analysis was conducted, by stepping back through the years of available data and conducting VPA tuning at each step, ignoring all data in the subsequent years. This analysis was done for the base VPA run with constant F ratios. The results indicated that there is a tendency to underestimate F's on younger fish (ages 1-3) and overestimate F's on ages 4-5+ in the current year relative to the F levels that become apparent after additional years are added to the time series (SWO-Table 8). The retrospective pattern may result from several causes including mis-ageing and mis-specification of CPUE models.

No tuned VPA analyses were carried out with the data obtained with the alternative "Kimura-Chikuni" ageing approach (see SWO-Section 2.d) because of problems with the resulting indices of abundance. Simple cohort analysis where the terminal fishing mortality was fixed were carried out with the alternative catch at age table and results were similar to those obtained with the base data (see Section SWO-2.f of the "Record of Analyses"). Because of the unresolved problems with the alternative ageing methodology, the Committee recommended further evaluation of this and alternative ageing methodologies.

SWO-ATL-2.g Yield per recruit

The Committee noted that the ICCAT recommendations for minimum size and other regulatory measures went into effect in 1991, although they may not have been fully implemented during the entire year. The last year of the VPA analysis includes the effects of the initial implementation; however, the results are not clear. It is expected that selection patterns of the fishery are likely to be altered in response to these regulations. Therefore, the present analysis focused on the long-term potential gains (and losses) in yield per recruit and fishing mortality rate benchmarks that have occurred as the fishery shifted its 1988 fishing pattern to that which existed in 1991.

Three yield-per-recruit scenarios were examined (SWO-Table 9): (1) yield-per-recruit and F rates under the 1988 fishing conditions; (2) under 1991 fishing conditions; and (3) under 1991 fishing conditions with selectivity averaged between 1989-91 for the partially recruited ages. The analyses indicate that estimates of current F (labeled initial F in the table) were likely to have been larger than common reference fishery mortality rates ($F_{0.1}$, F_{max}); however, the 1991 vector (case 2 in SWO-Table 9) appears to be near F_{max}. Reductions in F and changes in selectivity from 1988 to 1991 have resulted in potential gains in long-term yield. However, any discard mortality could dissipate that potential. Discard mortality implies that there is mortality on young fish that is not accounted for in the analysis and when it is not accounted for, the result would be an overly optimistic view of the stock status. The Committee reiterated the importance of obtaining estimates of discard mortality, perhaps by observer programs, in order to evaluate the effect of the ICCAT recommendations in subsequent years.

SWO-ATL-2.h Projections

2.h.1 VPA Projections

The Committee carried out a projection analysis using the VPA assessment under two scenarios. The projection was made through 1993 to the beginning of 1994 assuming catch remains constant over that period. Specifically, the projections assume: (a) that the selectivity pattern was constant from 1991 through 1993; (b) the selectivity of age 0 to 4 fish was the average of the 1989-91 fishing mortality rates estimated in the base case VPA; the age 5+ selectivity was defined by the 1991 fishing mortality rate from the VPA; (c) catch in weight was assumed to be constant from 1991 through 1993; and (d) recruitment is constant at the average 1978-88 recruitment from the VPA. Then the two scenarios were run assuming: (1) that the 1990 year class was equal to that estimated from the US age 1 CPUE index; and (2) that the 1990 year class was equal to that estimated from the Spanish

age 1 CPUE index. These two scenarios were included to indicate some of the effects of uncertainty in the estimates of age 1 in the most recent year in the VPA. It must be noted that since both of these scenarios assume a constant catch with a constant selectivity, an unusually large or small year-class of 1 year olds in 1991 could affect the overall fishing mortality rate that is needed to maintain a constant catch.

The results (SWO-Table 10) indicate that the recent increase in abundance of 5+ stock size is expected to continue in 1993, if fishing mortality were to remain the same as in 1992-93. This is due to the stronger year-classes estimated for the late 1980's entering into the 5+ group. The magnitude of the increase in the 5+ stock size is larger if the catch shifts to the high estimated 1990 year-class (Case 1: SWO-Table 10); and is smaller if the 1990 year class is similar to previous levels (Case 2: SWO-Table 10). As indicated in the VPA discussion (see Section SWO-2.F.), the actual size of the 1990 and subsequent year classes is very uncertain.

The VPA projections indicate that current (1991) catch levels could allow for some increase in age 5+ stock size by 1993. The degree of potential increase depends on the relative strength of recent year-classes, which is highly uncertain. Because of this uncertainty, no advice on the future status of juvenile (ages 1-3) can be provided.

Long-term sustainability of the 5+ stock level would require that one or all of the following events occur: either 1980 recruitment levels continue into the future, or that fishing mortality continue to decrease or that selectivity on young fish continue to be reduced.

SWO-ATL-2.i Other fishery indicators

Average weights (kg in round weight) of swordfish in the orth Atlantic are plotted in SWO-Figure 12) for Japan, Spain, the U.S., other nations, and all nations combined. Average weights of swordfish caught by all fisheries, with the exception of the Japanese fishery, tended to decrease through the 1980's. All fisheries reported an increase in average weight in 1991. The Committee could not draw conclusions from these plots.

SWO-ATL-2.j Summary of stock assessment

Despite the analogous trends in the results of the production and age-structured models, there is an important difference in the results of these two methods:

1) The age-structured model estimated that since 1978 the stock has remained near a level of full exploitation in terms of yield per recruit for the 1978 fishing mortality rate, and the equilibrium yield per recruit is estimated at a level only 3 percent below the maximum of this parameter. This estimate of a high exploitation rate continued during the entire 1978-1991 period (mean F's were always near or higher than the natural mortality).

2) In contrast, the production model estimated that the equilibrium catch corresponding to the observed 1978 fishing effort could be increased by around 50 percent before reaching the MSY (moderately exploited stock).

The apparent discrepancy between these results can be reconciled to form a consistent hypothesis of population dynamics if it is assumed that recruitment of swordfish is negatively correlated with parent stock abundance. With such as assumption fishing mortality at MSY could be higher than F_{MAX} (the fishing mortality that maximizes yield per recruit). VPA estimates of abundance, in fact, support this hypothesis regarding stock and recruitment, but it is viewed with caution. These stock and recruitment hypothesis and other hypotheses should be explored further.

It is possible to find VPA results different from the production model results. The VPA analyses should better take into account the catches of individuals aged 5+, which are currently not adequately considered in the VPA, (four ages and one pooled older age group were analyzed when approximately 15 year-classes are taken). The oldest age group is significant in the population and the fishery, because of the longevity of this species.

These new analyses bring back into question a number of current working hypotheses (for example, catch history, constant catchability and growth relationships) and would quite probably lead to estimations of levels of F, underlying populations and yield per recruit which are different between the current estimations.

SWO-3. Effects of Current Regulations

Prior to the ICCAT recommendations in 1990, several national regulations were adopted by different countries, mostly for the regulation of gear and licensing control. Canada limited entry into the swordfish fishery in 1984, has strict vessel size replacement regulations and does not permit gillnetting of swordfish. Driftnets targeting swordfish have also been banned by Spain (1990).

The ICCAT recommendations for swordfish took effect in July, 1991. They include, among others, the following specific measures:

1) Contracting Parties actively fishing for swordfish as target species in the north Atlantic should take measures to reduce the fishing mortality (or reduce fishing effort which results in an equivalent reduction of fishing mortality) of fish weighing more than 25 kg in the areas north of five degree north latitude by 15 percent from recent levels (referred to as 1988).

2) In order to protect small swordfish, the Contracting Parties should take the necessary measures to prohibit the taking and landing of swordfish in the entire Atlantic Ocean weighing less than 25 kg (125 cm lower jaw fork length) with a maximum 15 percent incidental catch allowance in number per trip.

3) Contracting Parties with small catches from directed swordfish fisheries should limit fishing mortality of swordfish in the entire Atlantic to the level of catch in 1988, or limit fishing effort that will result in the equivalent level of fishing mortality.

4) Contracting Parties whose nationals do not target swordfish in the North Atlantic shall take necessary measures to limit the incidental catch to no more than 10 percent of the total weight of the entire catch.

In response to the 1990 ICCAT recommendations for swordfish regulatory measures in the Atlantic, the United States, Spain, Japan, Canada, and South Africa have adopted national regulations in conformity with the ICCAT recommendations.

Regarding the reduction of fishing mortality (or the equivalent amount of fishing effort), in the north Atlantic, estimated F has decreased by 15 percent to 42 percent, relative to 1988 (SWO-Figure 13). The catch has, accordingly, has also decreased from 19,137 tons in 1988 to 13,212 MT in 1991, a decrease of 31 percent (SWO-Figure 14).

SWO-Table 11 and SWO-Figure 15 show the percentage of undersized fish (LJFL < 125 cm) for major countries in the North Atlantic and in the total Mediterranean fisheries. The percentage in the Atlantic has generally declined in 1991. This may reflect the regulations or changing effort distributions and stock dynamics. Although there is also information indicating an increase in discards of swordfish for the U.S. fishery (SWO-Figure 16), there are no data relating to discards in other fisheries in the Atlantic. SWO-Table 12 and SWO-Figure 17 provide estimates of the proportion of swordfish in the total catch of the tuna and billfish catches of Japanese, Korean, and Taiwanese longliners in the north Atlantic.

Since the Committee did not have sufficient time to develop estimates of fishing mortality for the entire Atlantic relative to the 1988 level, they could not judge the effectiveness of that management recommendation. However, the total Atlantic catch has decreased from 30,848 MT in 1988 to 24,954 MT in 1991, a decrease of about 20 percent. Nearly all this reduction is due to lower catches in the north Atlantic. Catches in the south Atlantic continue to be above the 1988 level.

SWO-4. Recommendations

Due to the nature of the stock dynamics of swordfish, the Committee recommended that stock assessments only be conducted every two years, during an intersessional meeting, and at least one month before the SCRS plenary sessions.

SWO-4.a Statistics

Significant progress in data collection was made this year, especially as regards the Mediterranean, due to the GFCM/ICCAT Expert Consultation held in Crete in September, 1992, and as regards the southwest Atlantic, due to the Data Preparatory Meeting held in Brazil in July, 1992. However, there are several aspects of data reporting that could be improved.

i) All countries catching swordfish (directed or by-catch) should report catch and effort statistics by five degree rectangles, or by smaller areas, by month.

ii) All countries should carry out an adequate level of size sampling, and when possible, sampling by sex and LJFL, preferably by month and by five degree rectangles. The Committee also recommended that the ICCAT Billfish Program continue to cover the Venezuelan longline fishery and that appropriate conversions from PFL to LJFL be developed.

iii) Efforts by the national scientists should continue to collect critical fishery statistics not covered by the ICCAT data collection systems, especially for various Caribbean countries, Mexico, and large Portuguese longline boats.

iv) Information on the number of undersized fish caught, and the numbers discarded dead and alive should be reported so that the effect of discarding is included in the stock assessment. The Committee noted that a randomized observer sampling program had been implemented by the U.S. in 1991. Other countries should establish sampling programs that will acquire these data. In many cases, implementation of such a program will require observer coverage.

v) All countries with driftnet, trawl, and pair-trawl fisheries should report their catch, effort and size data.

vi) Deadlines for reporting Tasks I and II catch and size data must be strictly adhered to in order to facilitate timely stock assessments. Late, unsized, unraised data may not be accepted after 31 July for inclusion in the current year assessment. A catch-at-size table must be available when the stock assessment session begins.

SWO-4.b Research

Although several studies have been carried out in compliance with 1991 recommendations, both in biological and methodological aspects of stock assessments, the Committee the following research items:

i) A validated growth model should be developed with the use of hard parts.

ii) A workshop on the technical aspects of methodologies which account for individual growth variability by age is strongly recommended by the Committee. This workshop should be of interest to all SCRS species groups and results from the 1992 Swordfish Stock Assessment Session indicate that an inter-sessional workshop is a top priority item, and should be held before the next swordfish stock assessment.

iii) Development of scientific tagging experimental designs to test hypotheses of growth and stock structure should be initiated. Development of cooperative tagging experiments by all nations should be encouraged. The use of tetracycline in tagging and the collection of hard parts from any recovered fish are also recommended.

iv) Research should be continued on maturity and fecundity at age and sex ratio at size. Coordinated study between the interested countries is recommended.

v) Sensitivity analysis is needed on VPA and other assessment techniques or models that will allow evaluation of the impact of mixing rates for stocks exploited over the vast areas of the Atlantic. This should include approaches that consider geographical expansion in fisheries with respect to production models. Procedures for comparing appropriate stock characteristics from VPAs and production models should be addressed.

vi) Genetic techniques to identify stock(s) and quantify mixing rates should be explored. Samples for mtDNA analysis from the various parts of the Atlantic and other ocean basins should be provided to develop the stock identification analysis.

vii) Further evaluation of the Canadian catch and effort information over the available time series and development of age-specific indices from these data are recommended.

viii) Development of a weight-based, standardized CPUE series from the Japanese longline data prior to 1978 was recommended.

ix) Development of *a priori*, objective criteria for outlier detection and objective criteria for rejection of data on biological or fisheries grounds for the various time series data sets used in assessments was recommended.

x) Development of standardized CPUE from all of the major fisheries for south Atlantic swordfish was recommended. It was also recommended that national scientists familiar with these fisheries participate in the swordfish assessment. In this connection, cooperation of Japanese and Brazilian scientists will improve the Japanese longline index for south Atlantic swordfish.

SWO-4.c Management

Due to the availability of reliable CPUE series and time constraints, the north Atlantic stock (north of 5°N) was given higher priority for VPA and production model analyses. Since most of the current regulations apply primarily to the north Atlantic, the Committee felt this was justified. Therefore, the following comments and recommendations refer to the north Atlantic stock.

For several years, north Atlantic swordfish assessments have relied heavily on age-structured VPA's. These models are demanding in terms of the numbers of parameters estimated and the detail of data that are required: time series of age-specific catches and abundance indices. The development of a biomass-based CPUE index of abundance which starts in 1962, made it possible to analyze the data with a non-equilibrium production model (the production model uses simpler data than the VPA) without having to constrain some of the model's parameters to arbitrary values. As a result, this year's analyses and recommendations are based on two types of models instead of one.

The VPA analyses included several options for evaluating sensitivity of estimates on stock size and fishing mortality rate. The time trends in the estimates of population size and fishing mortality rate are summarized below.

1) Stock size estimates at the beginning of the year of age 1 swordfish (recruits) increased gradually from 1978 through 1987 (SWO-Table 7, SWO-Figure 10) remained at the same level in 1988, increased in 1989, and declined in 1990. The 1990 year-class (i.e., age 1 fish in 1991) may be considerably higher than in previous years, but the estimate is very uncertain. The 1991 year-class may be smaller than in recent years, but the estimate of this is even more uncertain. Stock size of the ages 2-4 juvenile group increased throughout the period 1978-87, and has been variable since then. The age 2-4 stock size at the beginning of 1992 increased substantially due to the calculated increase in the 1990 year-class. Adult stock size (ages 5+) declined continuously throughout the time series to approximately half of what it was in 1978. There was a small increase in the estimated abundance of age 5+ in 1992.

2) The fishing mortality rate (F, see SWO-Figure 11) of age 1 and the age 2-4 group fluctuated, but with a generally increasing trend through 1988, with a constant decline in 1989-1991 (SWO-Table 7). F on ages 5+ appears to have increased significantly during 1978-87 with a gradual decline from 1988 to 1991. The weighted average F estimated for ages 2-5+ in 1991 is 64 percent of the 1988 level and 141 percent of the 1978 level.

The results of the present VPA analysis show some improvement in adult stock size in the last year. This increase appears to be due to high recruitment levels in the late 1980's and to reduced catches since 1987.

Analyses by non-equilibrium production models were carried out on a longer CPUE time series, from 1962 to 1991. This allowed the model to estimate all parameters simultaneously. The estimates of maximum sustainable yield (MSY) ranged from 14,200 MT to 15,200 MT over the sensitivity cases examined. These estimates all included an approximate bias correction, which resulted in higher estimates of MSY (SWO-Table 6). The estimate from the base case, which used the entire data series, was 14,200 MT. This is within the range of the 1991 point estimates of 13,100 MT to 14,300 MT. The 1991 catch of 13,212 MT is about 1,000 MT below the estimated MSY, but is about the same as the estimated equilibrium yield at current stock sizes. The estimate of the current stock biomass is 16 percent below the biomass level which can produce MSY (B_{MSY}). Elimination of years in the biomass index used in the base case can provide a more optimistic estimate of current biomass relative to B_{MSY} (see SWO-Table 6). Further refinement of the biomass time series and inclusion of data from earlier years would be useful.

Results of the north Atlantic assessment analyses based on VPA estimate that current F is likely larger than commonly referenced fishing mortality rates, $F_{0.1}$ and F_{max}. However, results of the production model analysis estimate that current F is close to F_{MSY} (SWO-Figure 18). The Committee considered the VPA,

stock production and sensitivity analyses and a number of sources of potential bias. Current (1991) catch levels have declined, and the assessments indicate that the population decline has slowed or stabilized. Fishing mortality rates have also declined since peak values in 1987 and 1988.

Although comparisons of the VPA and production model results are difficult to put into a common scale, SWO-Figure 13 and SWO-Figure 14 provide a set of comparisons to guide discussion. The results of the analyses are consistent in many respects. The estimated fishing mortality rate trajectories are similar in pattern, with both model types showing rapid increases in fishing mortality rate after 1984, reaching maximum values in the period 1987-1988, and declining since. The relative stock biomass trajectories from the age/structured analyses are generally less dynamic than the resulting trajectory from the non-equilibrium production model, although the pattern of age 5+ biomass is more similar to that of the production model.

The VPA projections indicate that current (1991) catch levels could allow for some increase in age 5+ stock size by 1993. The degree of potential increase depends on the relative strength of recent year-classes, which are highly uncertain. Because of this uncertainty, no advice on the future status of juveniles (ages 1-3) can be provided. Projected 1993 increases in age 5+ abundance result from increased recruitment in the late 1980's and/or recent reduction in the fishing mortality rate. Long-term sustainability of the age 5+ abundance, under current catch levels and fishing mortality rate patterns, require recruitment to be maintained at the levels of the late 1980's. The production model estimates that current 1991 catch levels (1991) would probably result in little or no change in stock biomass since current catch levels are very close to the present estimated equilibrium yield.

Sustained higher levels of yield can probably be achieved in the long term under lower mortality rates. The Committee previously recommended the reduction of fishing mortality below the 1988 level as well as a reduction in the catch of juveniles. The new analysis for the north Atlantic stock indicates that the mortality estimates have declined below levels estimated for 1988. However, the impact of dead discards would mean that the fishing mortality rates for 1991 and 1992 would be in excess of those used in this document. Information on the effectiveness of minimum size regulations is not available so the Committee cannot evaluate the realized benefits to the stock. The stock production model estimates that if the current harvest level (1991) were taken, stock biomass would increase slightly through 1993. VPA projection results indicate that if the current harvest level (1991) were taken, 1993 stock abundance could equal to, or larger than, 1991 abundance. Enhanced monitoring can improve our understanding of the effect of the current management program. At this time, the Committee cannot reach a consensus on any additional recommendation for management of the north Atlantic swordfish resource.

The Committee is seriously concerned about stock status of the total Atlantic stock, especially because of the rapid increase in the catch from the south Atlantic in recent years. Furthermore, much of the shift in effort from the north Atlantic has been to latitudes to just south of 5°N, which is cause for concern, given the possibility of a total Atlantic stock of swordfish. The present south Atlantic catch is about the same as the north Atlantic catch. There has also been a decline in adult fish CPUE from the south Atlantic zone, as noted in the 1991 SCRS Report. Therefore, the Committee recommended that the fisheries in the south Atlantic be monitored closely and that national scientists familiar with these participate in stock assessment.

MEDITERRANEAN

SWO-MED-1. Description of Fisheries

Swordfish are widely distributed in the Mediterranean (including the Aegean and Ionian seas) and are fished by many nations, mainly using longline, gillnet and harpoon. The largest producer is Italy (53 percent), followed by Greece (15 percent) and Spain (9 percent). Gillnet fishing was banned in Italy in 1990, but has resumed since 1991, and represents nearly half of the Italian swordfish catch. Spanish and Greek catches are mostly by longline. The national fisheries are well summarized in the "Report of the Second GFCM/ICCAT Expert Consultation on Stocks of Large Pelagic Fishes in the Mediterranean Sea" (Crete, September 17-23, 1992) (COM-SCRS/92/17).

The Mediterranean total swordfish catches (SWO-Table 1 and SWO-Figure 19) showed an upward trend from 1962-1972, stabilized between 1972-1977, and then resumed an upward trend. In particular, a sharp

increase was recorded between 1983 and 1988 (about three fold). A part of the increase is an artifact of improved statistics during this period, particularly from Italy. A record catch of over 20,000 MT was made in 1988, and thereafter the catch has decreased to about 13,000 MT in 1991.

SWO-MED-2. State of Stock

SWO-MED-2.a. Stock structure

It was reported at the GFCM/ICCAT Joint Consultation that genetic (mtDNA) samples from the Mediterranean Sea (three areas), Tarifa (Atlantic, just off the Strait of Gibraltar) and the Gulf of Guinea (SCRS/92/84). Samples from the Mediterranean and Tarifa did not differ from each other, though the samples from the eastern tropical Atlantic did differ significantly from the other samples. This information suggests one separate homogeneous stock in the Mediterranean, with some movement between the north Atlantic and Mediterranean, as has been previously reported (see also SCRS/89/34, SCRS/91/37, SCRS/91/38, and SCRS/92/49). In addition, Spain, Italy and Greece are conducting a joint tagging study to examine stock structure in the Mediterranean and Atlantic.

SWO-MED-2.b. Catch at size/age

The catch-at-size series (1985-91) was recalculated during the recent GFCM/ICCAT Consultation, as the historical catch data were changed significantly for most of the major countries and with the addition of new size data sets. The SWO-Figure 20 shows the annual accumulated catch at size. The average size of the Mediterranean catch has declined from 1985 to 1988 and has remained at about 20 kg (or 116-118 cm in LJFL) (SWO-Figure 21) compared to much larger fish caught in the Atlantic (SWO-Figure 12).

Documents SCRS/92/89 and SCRS/92/90 present preliminary growth studies of swordfish caught in Algerian waters. After comparing several growth studies made on Mediterranean swordfish, the Consultation recommended using the von Bertalanffy growth equation with parameters $L_{inf} = 243$, $K = 0.14$, and $t_0 = -2.6$ with day of birth on July 1.

SWO-MED-2.c. Catch rate

Considerable new data have become available on catch-per-unit-of-effort for swordfish, most of which were presented during the recent GFCM/ICCAT Consultation. The major CPUE series are shown in SWO-Figs. 22 and 23. The Cypriot catch (in weight) per hooks shows a general declining trend from 1976 until 1987, and thereafter stabilized at about one-quarter of the 1976 level. Spanish, Italian and Greek CPUE (in weight, beginning in the early to mid-1980's) was stable at a similar level as the Cypriot CPUE for the same time span. In contrast, the CPUE (in number) increased from 1984 through 1991; however, the data are not continuous through the time period for each series.

The Committee examined these series and, although they were encouraged to see these new data, concluded that at present there is some risk of misinterpretation if used in tuning a VPA or for a production model for the following reasons: the time periods covered for each series are very short; the CPUE are nominal and are not standardized; and there were no participants at the ICCAT Swordfish Stock Assessment Session who were familiar with those fisheries and who could provide essential information (changes in fishing area over time, socio-economic effects, changes in fishing efficiency, etc.).

SWO-MED-2.d. Population parameters

The Committee noted that the Consultation had adopted a new equation (lower-jaw fork length to round weight; SCRS/92/87). However, concern was expressed about the lack of a reliable conversion factor to convert gilled and gutted weight to round weight, although the Committee recognized that 1.12 was recommended by the experts at the Consultation (SCRS/-92/17).

SWO-MED-2.e. Stock assessments

The Committee reviewed the catch-at-size base and the CPUE series and concluded that application of production models or virtual population analysis is premature. The catch-at-size series are only for seven years. None of the CPUE series are standardized or cover a period of meaningful length, and they are

difficult to separate by age categories. Most of the fisheries are very local and do not represent total populations.

However, the Committee noted a recent declining trend in total catch as well as in average weight (as calculated from the combined catch at size) (SWO-Figure 21). Considering that the total Mediterranean swordfish catches are nearly the same as the total catch in the entire north Atlantic, the Committee stressed the importance of carrying out proper stock assessment, and requested that scientists knowledgeable in these fisheries attend the ICCAT assessment sessions to facilitate this work.

The proportion of Mediterranean fish under 125 cm in lower-jaw fork length is compared to the north Atlantic fisheries in the SWO-Table 11. The proportion of small fish is highest in the Mediterranean among the various regions compared (with an increasing trend for recent years).

SWO-MED-3. Effects of Current Regulations

There have been no regulations recommended by the Commission for the Mediterranean areas. There are numerous national regulations on driftnets, swordfish sizes and fishing areas. For example, a minimum size regulation (LJFL), allowing only for a maximum of 10 percent per trip in weight of swordfish with a length less than 140 cm, has been adopted by Italy since the early 1980's. However, it is not clear to the Committee how these are implemented at the national level. For this reason, the effects of these regulations are not evaluated.

SWO-MED-4. Recommendations

SWO-MED 4a. Statistics

While recognizing the marked progress made in reporting catches, size and effort data, the Committee recommended that:

ii) The GFCM/ICCAT Joint Consultations should be continued because of the lack of critical statistics from some non-ICCAT member countries which have important swordfish fisheries, particularly in the Mediterranean.

ii) all the catch and effort as well as size data available be sent to the ICCAT Secretariat by the Task I and Task II data submission deadline dates, even if there is no joint GFCM/ICCAT meeting.

iii) catches (particularly Task I) be reported in round live weight;

iv) all countries catching swordfish, report catches and effort by small areas and by month (in the ICCAT format);

SWO-MED 4b. Research

i) The Committee noted that the establishment of an ad-hoc Working Group on the Mediterranean Large Pelagic Fish between ICCAT and GFCM was proposed at the recent Joint Consultation. The Committee fully endorsed this proposal and recommended that this Group be established as soon as possible, with the GFCM Secretary serving as the Administrative Secretary and the ICCAT Secretariat serving as Technical Secretary. The Committee recommended that this Group be open to all the ICCAT and GFCM members and that activities start immediately, through correspondence, until such a time when the Group could meet.

ii) The Committee concurred with all the recommendations made by the Consultations concerning joint research on swordfish in the Mediterranean Sea, including tagging and genetic studies.

iii) A proper factor(s) for converting gilled and gutted weight to round weight of fish should be developed, and which might vary from one fishery to another.

iv) The CPUE series should be critically reviewed and standardization must be made.

v) Existing CPUE series should be updated for each year (particularly for Italian longlines and gillnets and for the Greek longline series).

vi) No GFCM member countries, except for Spain, participated in this swordfish stock assessment session. This hindered implementation of any meaningful stock assessment on the Mediterranean stocks. The

Committee urged that GFCM countries, even if they are not ICCAT Contracting Parties, participate in future stock assessment sessions.

SWO-MED 4.c. Management

The Committee expressed grave concern about the magnitude of the catches in the Mediterranean areas, particularly small fish. Due to the lack of adequate data for a quantitative stock assessment, no management recommendations could be made at this time.

SBF - SOUTHERN BLUEFIN

SBF-1. Description of Fisheries

Southern bluefin tuna (SBF) are distributed exclusively in the oceans of the southern hemisphere. The only known spawning ground is located in the water off Java, Indonesia, and northwestern Australia. The habitat of young fish is located in coastal waters of western and southern Australia, and as they grow, they migrate circumpolarly throughout the Pacific, Indian and Atlantic Oceans.

Historically, the stock has been exploited by Australian and Japanese fishermen for more than 35 years. During the course of this period, the Japanese longline fishery taking older aged fish recorded its peak catch of 77,927 MT in 1961 and the Australian surface catch of young fish peaked at 21,500 MT in 1982. In the 1970's, New Zealand participated in harvesting this species by handline, troll and longline in the coastal waters. In 1991, catches by these three countries were 4,162 MT (preliminary), 7,360 MT (preliminary) and 160 MT for Australia, Japan and New Zealand, respectively. In recent years, catches countries other than the aforementioned three increased and were estimated at more than 1,600 MT. As regards the Atlantic Ocean, southern bluefin tuna are caught by the longline fishery, mainly in the area off the southern tip of Africa. The Atlantic catch has varied widely between 400 MT and 6,200 MT during the 1978-1991 period (SBF-Table 1 and SBF-Figure 1), reflecting the shifts of the Japanese longline fishery between the Atlantic and Indian Oceans.

SBF-2. State of the Stocks

At the Eleventh Meeting of Australian, Japanese and New Zealand Scientists on Southern Bluefin Tuna held in Shimizu, Japan, in October 1992, the status of the stock was re-evaluated on the basis of the updated catch at age, fishing effort and tagging data. Fishery indicators were examined to provide a description of events in the fishery. Fishery modeling results from sets of VPA's based on differing assumptions showed similar results:

-- The parental stock (8 years-old and older) has decreased continuously to 1991, and still remains at an historic low level, as noted in previous years. The parental stock level of 1991 was remarkably low compared to the 1980 level, below which it is expected that the probability of poor recruitment increases as parental biomass decreases.

-- Abundance of the juvenile (4-7 years-old) stock has increased since 1986, mainly as a result of the drastic reduction of surface fishing in recent years.

-- Recruitment (number of stock at age 1) has declined from the early 1980's to at least 1985, although stronger recruitment has occurred in 1986, 1987 and 1988.

-- Forward projections are highly sensitive to the assumptions made for stock-recruitment relationships.

SBF-3. Effect of Current Regulations

Since 1971, as a first stock management action, Japanese longline fishermen have adopted a voluntary measure of restricting southern bluefin fishing in areas where young fish are abundant, to increase the age at first capture so as to expect a better yield per recruit. Since the 1984 fishing season, Australia has maintained a national quota of 14,500 MT and a seasonal-area closure of its fishery off western Australia. Japan and New Zealand introduced national quotas of 23,150 MT and 1,000 MT, respectively, for the 1985 fishing season. Since the 1987 fishing season, Australia and Japan reduced their catch limits to 11,500 MT and 19,500 MT, respectively. In 1989 the Tripartite Administrative Meeting decided to reduce the catch limits to 6,065 MT for Japan, 5,265 MT for Australia and 420 MT for

New Zealand. In 1990, 1991 and 1992, the Administrative Meeting decided to continue their catch limits.

SBF-4. Recommendations

The Committee noted that the ICCAT statistical system will continue to be important for monitoring the fishery for this species in the Atlantic Ocean.

The Committee made no recommendation for the management of southern bluefin tuna in the Atlantic Ocean, since the stock in the Atlantic is a part of the total population and it has been monitored by the other international body.

SMT - SMALL TUNAS

SMT-1. Description of Fisheries

Small tunas are exploited mainly by the coastal artisanal fisheries, although substantial catches are made either directly or as by-catch by coastal purse seiners. About ten species make up the small tunas category, but only five of these species account for about 76 percent of the total catch weight in 1991. These five species are: Atlantic bonito, Atlantic black skipjack, frigate tuna, spotted Spanish mackerel, and king mackerel (SMT-Figs. 1-6). The historical catches of small tunas are given in SMT-Figs. 7-13. The reported total catches of all species combined increased from about 50,000 MT in 1962 to over 100,000 MT in 1969 (SMT-Figure 1). Catches remained stable between 1970 and 1979 at about 80,000 MT, increased to more than 140,000 MT by 1981, followed by a steady decline to about 100,000 MT 1986, and a subsequent increase to nearly 140,000 MT in 1988. Catches for the 1989-1991 period have remained stable at about 123,000 MT (SMT-Figure 1). As regards 1991, preliminary estimates of total catches of small tunas amounted to 123,000 MT. A slight decline (2 percent) was recorded with respect to the previous year (SMT-Table 1).

SMT-2. Review of Work Carried Out

-- Statistics

The Committee noted some significant improvements in the available statistics this year. Specifically, the GFCM-ICCAT Joint Consultation (COM-SCRS/92/17) resulted in improvements in the catch statistics for small tunas from the Mediterranean. The Data Preparatory Meeting for Southwest Atlantic Tuna and Tuna-like Fisheries (COM-SCRS/92/15) also provided improved catch and effort statistics for these species from the southwestern Atlantic. The development of these fisheries is described in the report of the meeting (COM-SCRS/92/15).

The Committee noted that four CARICOM member States have begun to review their catch statistics and that these States will inform ICCAT of any changes needed in the estimates currently in the ICCAT database. However, not all species catches are believed to be reported, and there may be unreported catches taken by other CARICOM States (SCRS/92/154). Consequently, the Committee noted the need for CARICOM States to improve their catch statistics.

Document SCRS/92/149 summarized fishing statistics of small tunas caught by purse seiners off the African coast during the 1981-1992 period. This fishery operates around artificial flotsam (fish attracting devices) placed for the purpose of enhancing fishery production. The mixed species catches of small tunas from this fishery have increased from about 3,000 MT in 1981 to more than 10,000 MT in 1991. It is necessary, however, to make further improvements in statistics.

-- Research

Some additional biological studies on small tunas were carried out and reported to ICCAT this year. Document SCRS/92/165 reported on an analysis of the length-weight relationship for large (>110 cm FL) wahoo (*Acanthocybium solandri*) from the Canary Islands. Document COM-SCRS/92/15 also provided information on biological characteristics (fecundity, growth) for king and Spanish mackerels off Brazil. Two documents (SCRS/92/45 and SCRS/92/102) reported on the close association of small tuna species with large tunas and other large pelagic fishes. These associations can result in mixed species catches. The Committee also noted that a sampling program has

been implemented in Morocco. This program concerns length and weight measurements for small tunas, especially *Auxis thazard* and *Sarda sarda*, and should improve our knowledge on the biology of this species. The Committee is pleased that this additional information on small tunas is becoming available.

SMT-3 State of the Stocks

Current available information generally does not allow an evaluation of the status of the stocks of most of these coastal pelagic species. The available information presented to the Committee is summarized below.

Annual, age-structured stock evaluations of spotted Spanish and king mackerels are carried out for coastal areas of southeastern United States (SCRS/92/125). The results of these assessments show that several of these stocks have been over-exploited and that reductions in fishing mortality rates would allow the stocks to recover to levels that can provide high average long-term yields and provide adequate safeguard against recruitment failure. Risk assessments, which take into account the uncertainty in the stock evaluation analyses, are used to provide scientific advice about catch levels that could meet the objectives of the U.S. Fishery Management Plan which regulates allowable harvest of these species from U.S. waters.

Information from Brazil (COM-SCRS/92/15) corresponding to 1986, indicates that the Spanish mackerel stock off the Brazilian coast may have been over-exploited by that time. No more recent information on this stock is available.

SMT-4. Effects of Current Regulations

A U.S. Fishery Management Plan (FMP) for coastal pelagic species in the Gulf of Mexico and Atlantic Ocean has been effect since 1983. Under the FMP, fisheries management procedures were established for king (*Scomberomonus cavalla*) and Spanish (*Scomberomonus maculatus*) mackerels through implementation of catch quotas. The objective of the FMP is to maintain these stocks at abundance levels that could provide long-term yield as close to MSY as possible, while not allowing spawning biomass to fall so low as to negatively impact recruitment. Annual total allowable catches from these stocks are based on recommendations from a panel of scientists who conduct the annual stock evaluation analyses. These regulations appear to be effective in rebuilding the over-exploited stocks and in preventing the stocks from declining to levels that could negatively impact recruitment.

SMT-5. Recommendations

SMT-5.a Statistics

Catch and effort statistics for small tunas are incomplete for most of the coastal and industrial fishing countries. Therefore, the Committee recommended:

i) That special efforts be made to improve the catch data by species and gear of small tunas by the different fisheries (artisanal, industrial, recreational), as well as the corresponding nominal effort, inasmuch as possible.

ii) That estimates of discards, particularly off the African coasts, and estimates of other unreported catches of these species be made and provided to ICCAT.

iii) That more detailed estimates of catches of these species by Caribbean countries be made and provided to ICCAT through CARICOM.

SMT-5.b Research

There is a general lack of biological information needed for stock assessment of these species. For this reason, the Committee recommended:

i) That studies related to stock evaluation of small tunas be continued, inasmuch as possible.

ii) That additional length-weight data be collected on small wahoo, and an estimate of the relationship between length and weight for this species over be

iii) That standardized catch-per-unit-effort series be developed with the Brazilian small tuna catch and effort information presented in COM-SCRS/92/15.

13. Report of Sub-Committee on Environment

The Report of the Sub-Committee on Environment was presented by the Convener, Mr. J. Pereira (Portugal). The SCRS reviewed the Report and adopted it together with all the recommendations contained therein. The Report is attached as Appendix 8 to Annex 14.

14. Management and Responsible Fishing

-- International Conference on Responsible Fishing (Cancun, Mexico - May 6-8, 1992)

Dr. A. Fonteneau (France) presented a summary of the Conference on the above subject (COM-SCRS/92/19), which he attended as part of the Delegation of France. He reported that responsible fishing includes not only the concept of maintaining the maximum sustainable yield, but giving sufficient attention to environmental aspects. The meeting had many political as well as scientific aspects. Some criticism was made by the FAO Fisheries Department on the performance of international fisheries commissions, mainly as concerns the shortage of funds and personnel in these commissions, as well as the lack of a means to apply in an efficient way the management measures that have been established.

Dr. Fonteneau further referred to some documents presented by Conference participants (particularly, the Norwegian and Canadian reports on management of the fisheries). A Cancun Declaration was adopted and Dr. Fonteneau stressed that it was important for the Commission to take the points included in the Declaration into consideration in achieving the objectives of responsible fishing which go beyond those of the ICCAT Convention. One of the important conclusions reached at this Conference was the recommendation to create an adequate "code of conduct", which should be applied to all fishing operations carried out both within the EEZ as well as on the high seas.

-- FAO Technical Consultation on High Seas Fishing (Rome, September 7-15, 1992)

Dr. A. Fernández, Executive Secretary of ICCAT, referred the Committee to Document COM-SCRS/92/19, and summarized the results of the meeting of the FAO Technical Consultation on High Seas Fishing (Rome, September 7-15, 1992). He also reported that the meeting was very useful and was directly related to the objectives of ICCAT. The Consultation exchanged views on four major areas, including: (1) the collection of statistics; (2) assessments of highs seas stocks; (3) national and international mechanisms to carry out such management of high seas fisheries; and (4) subjects relative to FAO policy in the field of providing aid to developing countries.

Dr. Fernández stated that the Consultation dealt with some of the many technical and legal problems that have come about after the new U.N. Convention on the Law of the Sea was adopted, as well as a series of conferences relating to responsible fishing and environment. He pointed out the importance of carrying out fishing in harmony with the environment. The Executive Secretary emphasized the special characteristics of highly migratory species in relation to the high seas and exclusive economic zones.

Mr. J. C. Rey (European Community) stressed the importance of ICCAT's participation in various international and inter-governmental conferences on responsible fishing and the environment.

15. Report of the Sub-Committee on Statistics and Review of Atlantic Tuna Statistics and Data Management System

The Report of the Sub-Committee on Statistics was presented by the Convener, Dr. S. Turner (U.S.A.). The SCRS reviewed the Report and adopted it with all the recommendations included. The Report is attached as Appendix 7 to Annex 14.

16. Progress Made in the Collection of Information on Sharks

The Committee noted that the Sub-Committee on Statistics had prepared a summarized report on the results of a preliminary survey of the shark fishery and the collection of shark statistics (see Addendum 3 to Appendix 7). The survey consisted of three questions:

1) Does your country have a directed shark fishery?
2) Does your country have fisheries catching sharks as by-catch?
3) Does your country collect shark statistics?

Sixteen out of seventeen countries responded that sharks are caught as by-catch. Six countries responded that no shark data are collected. The remainder of the countries reported some shark catches, which are often all combined, but that the catches are not fully covered in the statistics. The Committee was informed that the most abundant by-catch shark species taken by longline is the blue shark and the most abundant by-catch taken by purse seine is the silky shark.

The Committee recalled discussions that had taken place at its 1991 meeting and reaffirmed that the study of sharks (particularly pelagic species) that are caught as by-catch of many tuna and tuna-like fisheries, is within the mandate of the Commission. Some opinions were expressed that sharks are as vulnerable as marine mammals, due to their special reproductive biology.

The Committee recommended that the Secretariat, in collaboration with various specialists, develop a more elaborate questionnaire so as to collect more information on what shark species and other marine animals are taken as by-catch by the current fisheries for tunas and tuna-like fishes, and to make rough estimates of the quantity of these by-catches. It was also recommended that the questionnaires be widely distributed to all the countries that fish tunas in the Atlantic and the Mediterranean, and that a summary of the survey be presented at the 1993 SCRS session.

The Committee recommended holding a working group session at next year's SCRS, whose terms of reference should be to establish the Committee's policy on the collection of information on marine animal by-catches in the tuna and tuna-like species fisheries, including the possibility of this working group becoming a Sub-Committee in the near future. The Committee should invite scientists to submit contribution papers to next year's meeting on the biology, stocks or statistics on sharks and other by-catches, as was done this year. A suggestion was made to establish contact with the Shark Committee of ICES to exchange information and for possible collaboration in the future.

17. Review of ICCAT Publications

The ICCAT policy on scientific publications were reviewed by the Executive Secretary. At the 1991 Commission meeting, it was agreed to publish a testimonial book dedicated to the previous Executive Secretary, Dr. O. Rodríguez Martín. This has not yet been realized and Dr. Fernández offered two alternatives: (1) issuing a special publication that includes voluntary contributions from various scientists; (2) holding a special symposium on ICCAT's achievements in the past 20 years and its plans for the future. The contribution papers for such a symposium can be published as a special issue dedicated to Dr. Rodríguez Martín. It was pointed out, however, that in either case, funding for an extra publication volume could be a problem under the present financial circumstances.

The Coordinator of the Billfish Program, Dr. B. Brown (U.S.A.) reiterated that the Enhanced Research Program for Billfish had proposed that the publication of the Report of the Second Billfish Workshop be done by enhanced printing and binding, with some extra additional outside funding. He proposed that this volume be dedicated to Dr. Rodríguez Martín with a personal tribute on the first page, including his picture. These two proposals were supported and approved by the Committee.

The Committee also considered that the publication of a special volume covering the 20-year history and achievements of the Commission would be very beneficial to the Commission's image, would increase the scientific status of ICCAT in the international community, and would also serve as a summary of the Commission's work. The Committee recommended that the Commission consider the possibility of publishing such a volume in the near future, taking into account the additional costs which this publication might involve.

18. Review of Future SCRS Activities

– Organization of the SCRS sessions
and
– Inter-sessional scientific meetings in 1993

The overall organization of the SCRS sessions and the inter-sessional scientific meetings for 1993 were discussed together. The Committee recognized that the swordfish and albacore groups proposed holding, in 1993, a consultation on the technical aspects of methodologies which account for individual growth variability by age. Canada has formally offered to host this workshop at the Biological Station in St. Andrews, New Brunswick, in June, 1993.

There were some discussion that the meeting venue might pose some financial difficulties for scientists outside North America, as well as for any members of the Secretariat staff to participate in this workshop. However, it was also recognized that the meeting would provide an excellent opportunity to take advantage of the technical expertise of various Canadian scientists who have ample experience working in this field for different species of fish. The Committee decided to accept the Canadian invitation.

The Committee noted that the yellowfin group had proposed to form a "Working Group to Evaluate Atlantic Yellowfin Tuna" and this was endorsed by the Committee. At the same time, the Committee recognized the need to hold the first meeting of this new Working Group in the 1993 inter-sessional period. Spain formally offered to host this first meeting, in June, 1993, at the Tenerife Laboratory of the Spanish Oceanographic Institute. The Committee accepted the invitation from Spain.

The Committee recommended that the Secretariat, in consultation with the SCRS Chairman and representatives of the two host countries (Canada and Spain) discuss, through correspondence, the logistical details, such as the meeting dates and schedules, etc. that are most acceptable to both host organizations and to the majority of the scientists interested in these meetings. The Committee emphasized the importance of participation of scientists from Contracting Parties and non-Contracting Parties who are working on yellowfin tuna research for the west Atlantic and Caribbean Sea.

The Committee also indicated the advantages of holding important stock assessment sessions relative to the Commission's management plan in advance of the regularly-scheduled SCRS meeting. Since an evaluation of the west Atlantic bluefin stock will be carried out in 1993, it was proposed that the stock assessment session be held during the first week of October. The exact dates will be decided by the SCRS Chairman, in consultation with the rapporteur and the Secretariat.

The Committee reiterated the swordfish group's recommendation that stock assessments on this species be carried out in alternate years. However, the Committee recognized that at least the effects of the regulations on this stock must be evaluated in 1993. Considering the extensive work required to carry out such studies, the Committee decided that the swordfish group would meet one week before the regularly-scheduled meeting of the 1993 SCRS. The rest of the species groups will meet for three days just prior to the SCRS session.

-- Other matters

The Working Plan for the Enhanced Research Program for Billfish was presented by Dr. E. Prince (U.S.A.), the West Atlantic Coordinator. This Plan was approved by the Committee. It was noted that full implementation might be difficult if private funding cannot be obtained as hoped. The Plan is attached as Appendix 10.

The Progress of the Albacore Research Program (Appendix 11 to Annex 14) was also reviewed, with respect to future plans. The Workshop to finalize the analysis of the Program is proposed for 1994, and this was approved by the Committee. However, further discussion will be held at the 1993 SCRS meeting.

The Committee also recognized that the Bluefin Year Program had been previously submitted to the Committee (Appendix 9) and it was approved.

The Committee established a "Working Group for a Feasibility Study on the Meristics and Morphometrics of Yellowfin Tuna". This Group met during the tropical tuna species group meetings and presented a report, which was adopted by the Committee, and is attached as Appendix 5 to Annex 14.

19. Cooperation with Non-Contracting Parties and Other Organizations

The Committee noted that this item had been substantially dealt with at the Sub-Committee on Statistics, and under SCRS Agenda Item 14.

The Committee reiterated the proposals made under various Agenda Items and the Sub-Committee on Statistics to approve the creation of a GFCM/ICCAT *ad hoc* Working Group. At the same time, the Committee proposed that the terms of reference of this group be carefully prepared between the ICCAT and GFCM Secretaries. The *ad hoc* Working Group should hold occasional meetings of scientists of both organizations for joint stock evaluations, and should serve as a mechanism for data and information exchange. In this respect, the Committee noted that the GFCM will be holding its Council meeting in June, 1993, in Malta, and considered this a good opportunity to address the problem of statistics in the Mediterranean area, which is making it difficult to carry out the assessments on large pelagic fishes.

20. Date and Place of the Next Meeting of the SCRS

The Committee decided that the next regular meeting of the Committee should be held for a five-day period during the week prior to the 1993 Commission meeting.

21. Other Matters

No other matters were discussed.

22. Adoption of Report

The draft Report was reviewed by the Committee and adopted, with some corrections.

Dr. Cort commended the Committee for the excellent work accomplished and the high quality of the documents and reports presented at this year's scientific sessions. He also thanked the scientists for their collaboration throughout the year. The SCRS Chairman also expressed his appreciation to the ICCAT Secretariat staff for their efficient work and the team of interpreters for an excellent job.

The representative from FAO also commended the ICCAT SCRS for the tremendous progress it has made in scientific research on tunas.

23. Adjournment

The 1992 meeting of the Standing Committee on Research and Statistics (SCRS) was adjourned.

YFT-Table 1. Atlantic yellowfin tuna annual catches (in 1000 MT), by east and west and by major gears

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
TOTAL	**58.0**	**65.0**	**69.3**	**68.0**	**58.8**	**60.2**	**83.2**	**92.7**	**73.1**	**73.3**	**93.5**	**94.7**	**106.7**	**124.6**	**123.2**	**128.8**	**138.5**	**125.1**	**125.1**	**151.1**	**159.4**	**160.2**	**111.7**	**150.0**	**134.2**	**134.7**	**127.9**	**154.4**	**173.1**	**164.3**
EAST ATLANTI	28.3	42.4	47.4	54.2	43.3	52.6	73.8	80.3	58.9	57.6	78.2	79.7	92.2	108.2	109.3	115.5	115.7	111.9	112.2	134.7	134	123.1	75.2	112.5	105.7	110	99.3	122.4	148.2	131.2
-SURFACE	10.6	19.1	28.5	26.7	30.7	35.5	51.9	59.9	42.8	42.8	60.1	59.2	72.7	92.7	96.4	99.4	103.5	103.7	99.2	121.5	120.9	113.1	64.2	103.4	99.5	102.3	89.6	113.5	139.4	123.6
BAITBOAT	10.6	17.8	21.2	18.5	15.1	16.8	22.1	15.7	9.5	10.6	13.1	14.7	19.7	9.7	12.7	11	9	13.8	7.5	9.7	13.1	11.5	13.7	16.1	15.1	16.4	16	12.3	15.5	17.7
ANGOLA	1.8	2.1	3.6	1.9	1.3	0.9	1.1	0.4	0.3	0.5	0.6	0.6	0.8	0.1	1	1.9	2	0.8	0.5	0.7	1.4	0.7	0.2	0.3	0.1	0.1	0.2	0.1	0.3	0.5
CAP VERT	0	0	0	0	0	0	0	0	0.3	0.3	0.5	0.4	0.4	0.4	0.1	0.1	0.5	0.6	0.9	0.6	0.8	0.9	0.9	0.7	1.3	0.9	0.5	0.9	0.5	0.7
FIS	6.1	12.3	13.2	12.7	13.1	14.4	18.6	14	7.4	7.4	7.4	5.5	6.3	2.9	3.7	3.4	2.8	2.2	2.1	2.9	3	2.7	3.4	2.9	3.8	3.8	4.4	2.6	3.8	4.4
GHANA	0	0	0	0	0	0	0	0	0	0	++	0.1	0.3	0.7	0.8	0.6	0.3	1.2	1.7	2.5	5.6	5	5.5	8.9	8.2	8.9	8.4	6.9	8.2	9.5
JAPAN	1.2	0.9	2.1	1.3	0.5	1.3	2.2	1	0.8	2	3.5	6.5	7.1	1.1	4.9	2.6	1.4	1	0.5	1.7	1.2	1	0.1	0	0	0	0	0	0	0
KOREA	0	0	0	0	0	0	0	0	0	0	0	0.7	1.7	2.7	1	1.2	1.4	3.9	1.4	1	0.4	0.1	0.2	0.1	0	0	0	0	0	0
PANAMA	0	0	0	0	0	0	0	0	0	0	0.4	0.1	1.1	0.8	1	0.9	0.4	0.2	++	0.1	0.3	0.1	0	0	0	0	0	0	0	0
SAFRICA	0	0	0	0	0	0	0	0	0	0	0	0	++	++	0	0	0	3.8	0.3	0.1	++	0.3	0.7	0.3	++	++	0.1	0.6	0.3	++
ESPANA	1.5	2.5	2.3	2.6	0.2	0.2	0.2	0.3	0.7	0.4	0.7	0.8	2	1	0.2	0.3	0.2	0.1	0.1	0.1	0.4	0.7	2.5	2.9	1.7	2.7	2.3	1.2	2.4	2.6
OTHERS	0	0	0	0	0	0	0	0	0	0	0	0	0	++	++	0	0	++	0	0	++	++	0.2	++	++	++	0.1	++	++	++
PURSE SEINE	0	1.3	7.3	8.2	15.6	18.7	29.8	44.2	33.3	32.2	47	44.5	53	83	83.7	88.4	94.5	89.9	91.7	111.8	107.8	101.6	50.5	87.3	84.4	85.9	73.6	101.2	123.9	105.9
CAYMAN I	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	1.5	0.1	0	0	0	0	0	0	0	0	0
FIS	0	0.8	5.8	6.5	8.9	9	12.7	14.4	16.6	18.6	23.8	26.2	31.9	43.8	46.3	44.3	48.9	43.2	47	48.9	39.5	36.1	4.4	9.5	13.1	13.5	17.4	28.4	40	29.8
GHANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.2	0	0	0	0.2	3	4.2	2.7	3.5	3.7	3.6	1	0	0	0	0
JAPAN	0	0	0.5	1.1	4.8	5.2	7.5	4.7	1.1	2	2.5	1.2	0.8	0.1	0	0	0	0	0	0	0.8	1.2	1.3	2.6	2.3	2.8	2.2	2.1	1.7	1.4
MAROC	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1	1.6	2.2	3.4	3	3.2	4.8	4.5	2.3	0.6	2.3	2.3	1.5	0	0	0	0
PORTUGAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.2	0.1	0.2	0.9	1.3	0.3	0	++	0	0	0	0	0
ESPANA	0	0.5	1	0.6	1.3	2.9	3.1	5.4	6.4	7.4	8.6	13.3	14	23.7	33.2	35.3	33.4	39.9	38.7	51.3	53.8	51.1	37.5	64	60.2	63.4	47.9	60.5	66.2	56
USA	0	0	0	0	0	0.9	5.8	18.8	9	3.8	12	3	5.6	14	1.7	6.4	8.1	2.9	1.6	1.5	0.6	0	0	0	0	0	0	0	0	0
USSR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0.1	++	0.1	0.9	1.2	1.8	3.4	1.4	0.7	2.2	3.7	3.4	3.2
NEI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.4	5.4	0.8	0.7	0.8	2.5	3.6	6.2	12.5	15.5
OTHERS	0	0	0	++	0.6	0.7	0.7	0.9	0.2	0.4	0.1	0.8	0.4	0.3	0.6	0.2	0.5	0.6	0.3	0.5	0.1	0.3	0.3	1.1	0.7	0.5	0.3	0.3	0.1	++
OTHER SURFA	0.3	0.1	0	0	0	0	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.9	1.4	0.6	5.3	3.2	3.9	2.4	1.6	2.3	3	2.3	2.5	2.5	2.7
CAP VERT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.6	2.7	3.4	2	1.2	2	1.8	1.8	2	2	2
OTHERS	0.3	0.1	++	++	++	++	0	++	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.9	1.4	0.6	0.7	0.5	0.5	0.4	0.4	0.3	1.2	0.5	0.5	0.5	0.7
-LONGLINE	17.4	23.2	18.9	27.5	12.6	17.1	21.9	20.4	16	14.7	18	20.4	19.4	15.4	12.8	15.7	11.3	6.8	12.4	7.9	9.9	6.1	8.6	7.5	3.9	4.7	7.4	6.4	6.3	4.9
CHITAIW	0	0	0	0	0.8	1.9	6.6	7	3.9	3.4	3.5	1.5	1	1.3	0.6	0.2	0.2	0.2	0.1	0.4	0.2	0.4	0.1	0.1	0.2	0.2	0.2	0.1	0.9	0.4
CUBA	0	0	0	0.5	0.4	2.4	1.2	0.9	1.1	1.4	3.2	4.5	3	1.7	1.8	2.9	1.9	2.6	4.9	2.5	2.1	1.6	1.2	1.1	0.7	0.8	1.4	0.4	0.7	0
JAPAN	17.4	23.1	18.5	26.5	10.6	10.1	9.8	6.4	2.5	1.6	2.3	1.3	0.7	1.7	0.3	0.1	0.3	0.3	1.7	1.2	2.8	0.9	2.9	3.1	1.3	1.7	3.6	3.8	4.2	4.2
KOREA	0	0	0	0	0	0	1.6	4.2	8	6.9	7.8	8.3	10.1	7.6	6.6	9.8	7.3	2.6	3.9	3.3	3.6	1.5	1.7	1.6	1	1.2	1.2	1.5	0.3	0.3
PANAMA	0	0	0	0	0	0	0	0	0	0	0.1	3.6	2.1	1.2	1.9	0.9	1.1	0.5	1.6	0.3	1.1	1.6	2.2	1.3	0.3	0.2	0	0	0	0
USSR	0	0	0.1	0.5	0.8	2.7	2.7	1.9	0.5	1.4	1.1	1.2	2.5	1.9	1.6	1.8	0.5	0.5	0.1	0.2	0.1	++	0.3	0.3	0.4	0.6	1	0.6	0.2	0
OTHERS	0	0.1	0.3	0	0	0	0	0	0	0	0	++	0	0	0	0	0	0.1	0.1	++	++	0.1	0.2	++	++	0	0	++	++	++

YFT-Table 1. Continued

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
WEST ATLANTI	29.5	22.2	21.6	13.6	15.5	7.6	9.4	12.4	14.2	15.7	15.3	15	14.5	16.4	13.9	13.3	14.8	13.2	12.9	16.4	25.4	37.1	36.5	37.5	28.5	24.7	28.6	32	24.9	33.1
-SURFACE	0	0.2	0.1	0	0	0.2	0.1	0	0	0	3.4	2.3	1.6	2	0.7	1.5	4.7	3.6	5.7	4.8	15.1	29.4	27	25.8	14.5	14.5	13.7	18.2	14.5	23.8
BAITBOAT	0	0	0	0	0	0	0	0	0	0	0	0	1.3	0.4	0	0	1	0.6	0.4	1.9	2.9	3.6	3.7	4.3	2.5	3.9	6	5	4.9	6.3
BRASIL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.4	0.9	1	1.8	1.3	2.2	0.8	1.6	1.6	1.4	1	1.2
JAPAN	0	0	0	0	0	0	0	0	0	0	0	++	1.2	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ESPANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3	0	0	0	0	0	0	0	0	0	.0	0	0
VENEZUEL	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0	0	0	0	1	1.9	1.8	2.4	2.1	1.7	2.3	4.4	3.6	3.9	5.1
OTHERS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	++	0.2	0	0	++	0	0	0	0	0	0	0	0	0
PURSE SEINE	0	0.2	0.1	0	0	0.2	0.1	0	0	0	3.4	2.3	0.3	1.6	0.7	1.1	3.6	1.1	5.2	2.8	12.1	25.8	23.2	21	10.7	8.4	6.8	12.2	8.9	16.8
FIS	0	0	0	0	0	0	0	0	0	0	2.6	1.7	0.3	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ESPANA	0	0	0	0	0	0	0	0	0	0	0.5	0	0	0.8	0	0.3	1	0.8	0	0	0	2	4	1	0	0	0	0	0	1.5
USA	0	0.2	0.1	0	0	0.2	0.1	0	0	0	0.3	0.6	0	0.4	0.5	0.8	1.6	0.3	0.5	0.3	0.1	0.1	1.1	4.4	0.6	0.1	0	++	0.3	1
VENEZUEL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.4	2.5	12	23.5	17.8	15.6	10.1	8.3	6.8	12.2	8.6	14.3
OTHERS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	1	0	0.3	0	0	0.2	0.3	0	0	0	0	0	0	0
OTHER SURFA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0.1	2	0.1	0	0	0	0.1	0.5	1.4	2.3	0.9	1	0.8	0.7
USA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	++	++	0	++	0.1	0.2	1.3	2.2	0.9	0.9	0.6	0.6
VENEZUEL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.8	0	0	0	0	0	0	0	0	0	0	0	0
OTHERS	0	0	0	0	0	0	0	0	0	0	0	0	0	++	++	0.4	0.1	0.2	0.1	++	++	++	++	0.3	0.1	0.1	++	0.1	0.2	0.1
-LONGLINE	25.9	18.8	19.2	11.4	13	4.9	7.8	10.4	13.9	15.4	11.6	12.4	12.5	14	12.7	11.2	9.6	9.2	6.5	11.3	9.8	6.7	7.9	10.6	12.5	9.7	14	12.9	9.7	8.2
BRASIL	1.4	2.4	1.6	0.7	0.5	0.8	0.8	0.5	0.8	0.3	0.2	0.2	0.2	0.3	0.7	0.9	0.8	1.1	0.5	1.2	0.9	0.9	0.5	0.5	1.1	0.7	0.9	1	0.6	0.3
CHITAIW	0	0	0	0	0.3	0.8	1.3	3.8	3.2	1	1.2	1.2	1.3	1.1	1.1	0.1	0.2	0.8	0.5	0.4	0.4	0.1	0.5	0.6	1	0.6	1.2	0.5	2.1	0.9
CUBA	0	1.7	0.9	0.2	0.4	0.6	0.7	0.6	0.5	0.3	0.4	0	0.4	0.6	1.2	0.9	0.7	0.2	0.7	2	1.5	0.8	2.5	1.9	2.1	1.1	0.1	0.1	0.1	0
JAPAN	24.5	14.6	16.6	10.4	11.8	2.7	4.2	3.6	4.3	9.1	4.2	2.5	2.8	2.4	3.1	1.4	1.6	1.7	1.1	3	3.3	1.2	1	2.2	2.1	1.6	2.4	3.2	1.7	1.7
KOREA	0	0	0	0	0	0	0.7	1.8	3.5	3	3.3	4.5	5.4	7.7	4.6	6.5	4.3	4.4	1.9	3.3	2.2	1.9	1	1.7	0.9	0.2	0.1	1.1	0.5	++
PANAMA	0	0	0	0	0	0	0	0	0	0	++	2	1.1	1.2	1.3	0.6	0.7	0	0.8	0.3	0.7	0.1	0.2	0	0.3	0.1	0	0	0	0
USA	++.	++	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	++	++	0	0.1	0.1	1.7	3.8	4.7	8.4	6.4	4.4	4.2
VENEZUEL	0	0	0	0	0	0	0	0	1.6	1.5	1.9	1.9	1.2	0.6	0.6	0.8	1.3	1	1	1	0.5	1.2	1.7	1.6	0.9	0.6	0.7	0.5	0.3	0.9
OTHERS	++.	0.1	0.1	0.1	0	++	0.1	0.1	0	0.2	0.4	0.1	0.1	0.1	0.1	++	++	0	0	0.1	0.3	0.4	0.4	0.4	0.3	0.1	0.2	0.1	++	0.2
-UNCL GEARS	3.6	3.2	2.3	2.2	2.5	2.5	1.5	2	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.5	0.4	0.7	0.3	0.5	1	1.6	1.1	1.5	0.5	0.9	0.9	0.7	1.1
MEXICO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	++	0	0	0.6	1.1	0.6	0.7	++	0.3	0.3	0.1	0.4
VENEZUEL	3.6	3.1	2.2	2.1	2.4	2.4	1.4	1.9	0	0	0	0	0	++	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OTHERS	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.5	0.4	0.7	0.3	0.5	0.4	0.5	0.5	0.8	0.5	0.6	0.6	0.6	0.7
UNCL REGION	0.2	0.4	0.3	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-LONGLINE	0.2	0.4	0.3	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

++ CATCHES: < 50 MT AND >= 1 MT

YFT-Table 2. Carrying capacity (in 1000 MT), by gear, of the east Atlantic surface fleets

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
TOTAL BB+PS	**36.5**	**32.2**	**42.3**	**54.1**	**46.0**	**53.5**	**68.4**	**62.0**	**67.6**	**69.6**	**77.1**	**81.8**	**61.3**	**52.3**	**49.5**	**45.8**	**43.9**	**44.3**	**46.5**	**59.3**
TOTAL BB	**7.3**	**7.6**	**13.0**	**13.2**	**9.7**	**13.7**	**15.5**	**14.7**	**12.8**	**11.8**	**11.7**	**11.5**	**11.3**	**10.8**	**11.0**	**8.8**	**9.2**	**9.6**	**9.9**	**9.9**
FISM	2.7	2.1	2.0	1.8	1.5	1.3	1.3	1.4	1.3	1.3	1.3	1.2	1.2	1.1	1.0	0.5	0.7	0.8	0.9	0.6
TEMA-BASED	3.2	4.0	8.7	9.2	7.3	11.0	12.8	11.6	9.7	8.7	8.1	8.0	7.2	6.6	6.6	4.8	4.8	4.8	4.8	4.8
SPAIN (CANAR.)	0.6	1.0	1.9	1.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
ANGOLA	0.3					0.5	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3
CAP VERT									0.2	0.2	1.0	1.0	1.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2
PORTUGAL	0.5	0.5	0.4	0.6	0.3	0.3	0.3	0.6	0.6	0.5	0.3	0.3	0.9	0.9	1.2	1.4	1.6	1.8	2.0	2.3
SPAIN (TROP.)																		0.1	0.1	0.1
TOTAL PS	**29.2**	**24.6**	**29.3**	**40.9**	**36.3**	**39.8**	**52.9**	**47.3**	**54.8**	**57.8**	**65.4**	**70.3**	**50.0**	**41.5**	**38.5**	**37.0**	**34.7**	**34.7**	**36.6**	**49.4**
FISM	9.2	12.4	14.5	17.2	17.5	14.6	17.6	16.5	17.2	16.8	16.3	16.8	4.8	3.0	3.0	5.1	6.0	6.0	7.0	12.7
SPAIN	5.2	7.1	8.4	12.6	16.8	20.7	24.4	25.9	29.5	30.6	31.7	38.0	33.5	30.3	27.3	23.7	20.5	19.5	19.7	22.8
U.S.A.	11.9	2.9	5.5	10.4	1.7	4.2	10.5	3.2	2.2	1.6	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
JAPAN	1.9	1.9	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.8	0.8	0.8	0.8	0.4	0.4	0.4
U.S.S.R.	0.1	0.1	0.1	0.1	0.1	0.1	0.2	1.0	3.0	3.9	4.9	4.9	4.9	5.4	5.4	5.4	5.4	5.4	4.2	6.9
OTH.**	0.9	0.2	0.2	0.4	0.2	0.2	0.2	0.7	2.9	4.9	10.8	10.2	6.4	2.0	2.0	2.0	2.0	3.4	5.3	6.6

* Provisional

** Ghana (1982-87), Mexico (1983), Congo (1980-81), Gran Cayman (1982-83), Portugal (1979-81), Venezuela (1983), and for recent years Morocco, Norway, Malta, Panama, Vanautu.

YFT-Table 3. Catch, abundance index and three estimates of fishing effort for the generalized production model

Year	Catch	Abundance Index	Effort Series 1	Effort Series 2	Effort Series 3
1969	80.4	5.82	13,800	13,291	13,291
1970	59.2	3.18	18,600	15,522	15,522
1971	57.5	2.71	21,200	16,911	16,911
1972	78.2	3.64	21,500	17,594	17,594
1973	79.8	3.25	24,500	18,444	18,444
1974	92.2	3.29	28,000	23,470	23,470
1975	108.1	2.48	43,500	25,715	25,715
1976	109.3	2.46	44,400	28,070	28,070
1977	115.3	2.94	39,200	27,027	27,027
1978	115.7	2.08	55,600	27,697	27,697
1979	111.7	2.02	55,300	29,947	29,947
1980	112.4	1.63	68,900	38,340	38,340
1981	134.8	1.67	80,700	41,377	42,618
1982	134.3	1.38	97,300	47,933	50,809
1983	123.4	1.36	90,700	48,653	53,032
1984	75.3	1.14	66,000	35,342	39,583
1985	112.6	1.69	66,600	33,342	38,343
1986	105.9	2.25	47,100	28,141	33,206
1987	110.1	1.86	59,200	30,104	36,425
1988	99.4	2.41	41,200	24,678	30,601
1989	122.3	3.70	33,000	20,970	26,632
1990	148.4	4.16	35,700	31,257	40,634
1991	124.2	2.39	52,000	33,198	44,153

Effort Series 1: Catch / abundance index
Effort Series 2: Standardized fishing time in FIS Category 5 purse seiners
Effort Series 3: The same as Series 2 with 3% annual increase of the fishing efficiency, since 1981

YFT-Table 4. Results of PRODFIT applications for three different effort series under consideraton

Effort series	m	MSY	Fopt	Fit Index	Effort 81-83	Effort 89-91
Series 1	1.00	121,000	60,000	0.75		
	2.00	129,000	61,000	0.74	90,000	40,000
	1.34	124,000	59,000	0.76		
Series 2	1.00	119,000	41,800	0.61		
	2.00	119,000	32,300	0.64	46,000	28,400
	2.80	122,000	36,600	0.65		
Series 3	1.00	118,000	45,800	0.74		
	2.00	117,000	38,900	0.77	46,000	37,100
	2.80	119,000	38,500	0.78		

YFT-Table 5. Abundance indices for adult yellowfin: Japanese longline CPUE (Honma's index) and large yellowfin CPUE by purse seiners

Cohort	Japanese LL Honma's index (69-89)	Avg. CPUE per 1 degree biweekly (over 30 kg)	Avg. CPUE of age 4+ Laurec-Fonteneau model (7 areas)
69	0.58		
70	0.51		
71	0.30		
72	0.39		
73	0.42		
74	0.45		
75	0.33		
76	0.24		
77	0.17		
78	0.28		
79	0.23		
80	0.23	1.01	43
81	0.21	1.12	46
82	0.23	0.88	55
83	0.15	0.86	46
84	0.26	0.36	28
85	0.26	1.07	27
86	0.19	1.89	81
87	0.32	1.31	47
88	0.29	1.63	68
89	0.21	3.69	147
90		3.48	133
91		1.55	72

YFT-Table 6. Temperatures observed in the equatorial area (5 degrees North, between 10 and 20 degrees West) during the first quarter of the year at 70 meters (average depth at which the purse seine is closed)

Year	Minimum	Average	Maximum
82	16	18	23
83	16	18	25
84	23	24	25
89	15	17	18
90	16	16.5	17

YFT-Table 7. Average fishing mortality rates and biomasses corresponding to the results of the cohort anaylses

	AGES (in biweeks)					
	5 to 12 biweeks		13 to 24 biweeks		3 to 24 biweeks	
Year	Mean F	Biomass	Mean F	Biomass	Mean F	Biomass
69	0.1892	102	0.1076	297	0.1295	423
70	0.1574	90	0.1082	279	0.1190	395
71	0.1812	126	0.0953	220	0.1220	371
72	0.1236	122	0.1357	212	0.1623	360
73	0.1729	122	0.1700	213	0.1655	359
74	0.2206	121	0.1452	237	0.1776	382
75	0.2338	110	0.2341	227	0.2215	362
76	0.2300	115	0.2802	200	0.2487	340
77	0.2914	109	0.2930	187	0.2706	321
78	0.2661	108	0.2683	171	0.2498	304
79	0.2426	119	0.3359	158	0.2784	301
80	0.2029	113	0.3516	169	0.2756	306
81	0.2524	114	0.5000	161	0.3906	300
82	0.3261	105	0.3913	168	0.3513	292
83	0.3255	81	0.3674	165	0.3382	271
84	0.3497	85	0.1290	162	0.2141	264
85	0.3021	81	0.3963	132	0.3433	238
86	0.2042	88	0.5731	100	0.4008	213
87	0.1882	113	0.5516	93	0.3974	230
88	0.2245	110	0.3888	129	0.3114	263
89	0.1452	105	0.5660	152	0.3839	281
90	0.1855	113	0.6760	143	0.4666	279
91	0.2151	105	0.5263	154	0.3983	282

BET-Table 1. Atlantic bigeye tuna annual catches (in 1000 MT)

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
TOTAL	**23.0**	**25.9**	**23.3**	**39.2**	**24.9**	**24.7**	**23.0**	**35.8**	**41.3**	**55.0**	**46.5**	**56.5**	**63.8**	**60.7**	**44.6**	**54.3**	**51.8**	**45.1**	**62.9**	**67.2**	**72.8**	**58.5**	**68.6**	**74.6**	**58.9**	**48.8**	**58.1**	**68.9**	**69.4**	**69.5**
-SURFACE	7.1	10.9	5.6	9.8	5.2	11.6	4.2	12.7	13.8	15.8	14.0	18.5	24.6	19.7	17.2	25.0	23.3	17.9	21.4	25.7	21.0	25.2	27.2	25.8	24.5	19.9	17.0	19.1	24.8	36.7
BAITBOAT	7.1	10.9	5.6	9.8	5.2	11.5	3.8	9.7	10.4	11.8	9.4	13.6	18.0	14.5	9.9	12.8	14.5	9.5	12.1	9.6	6.8	9.9	11.0	17.7	15.0	12.3	9.1	12.4	15.2	15.4
FIS	0.4	2.4	0.8	++	++	1.7	0.2	2.3	1.4	1.3	1.1	1.2	1.0	1.3	1.4	2.6	3.6	2.0	2.4	2.2	1.8	2.1	2.1	4.0	3.2	2.7	2.5	2.2	2.7	2.2
GHANA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	0.1	0.1	0.1	0.2	0.1	0.2	0.3	0.5	0.4	0.3	1.1	1.4	1.2	1.3	1.1	2.1	2.5	2.1
JAPAN	++	++	++	0.1	++	0.4	0.6	0.3	0.2	0.5	0.9	1.7	1.9	0.1	0.9	1.0	0.6	0.2	0.4	1.0	0.6	++	++	0.0	0.0	0.0	0.0	0.0	0.0	0.0
KOREA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.3	0.2	0.5	0.5	0.7	1.3	0.6	0.2	0.0	++	++	0.0	0.0	0.0	0.0	0.0	0.0
PORTUGAL	6.6	8.0	4.7	8.7	4.1	8.1	1.6	5.6	5.1	2.9	4.0	5.9	10.9	6.8	2.9	4.5	5.3	3.3	3.5	2.6	1.8	3.8	3.9	6.4	7.0	4.5	2.2	4.9	5.9	5.5
ESPANA	0.1	0.5	0.1	1.0	1.1	1.3	1.4	1.5	3.6	7.0	3.1	4.4	3.2	5.7	4.2	3.6	3.8	3.0	4.0	2.4	1.5	2.5	2.8	5.0	3.5	3.6	2.6	2.8	3.8	5.5
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.2	0.4	0.2	0.2	0.4	0.6	0.1	0.2	0.3	0.5	1.2	1.1	0.9	0.1	0.2	0.7	0.4	0.3	0.1
PURSE SEINE	0.0	0.0	0.0	0.0	0.0	0.1	0.4	3.0	3.4	4.0	4.6	4.9	6.6	5.2	6.9	11.5	8.6	7.9	8.7	15.3	13.9	15.2	16.0	8.0	9.2	7.1	7.6	6.3	9.4	21.1
FIS	0.0	0.0	0.0	0.0	++	++	++	1.3	2.4	2.6	2.8	3.2	4.2	3.5	4.9	6.0	4.9	4.9	3.3	5.4	4.8	5.6	2.0	1.0	1.1	1.3	1.7	1.2	2.2	4.3
JAPAN	0.0	0.0	0.0	0.0	0.0	0.1	0.4	1.3	0.3	0.5	0.7	0.3	0.2	++	0.0	0.0	0.0	0.0	0.0	0.0	++	++	0.5	0.5	0.3	0.4	0.4	0.1	0.2	0.9
ESPANA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.4	0.9	1.3	1.3	1.6	1.7	4.8	3.0	2.4	4.4	7.6	7.5	6.2	10.8	5.4	7.4	5.3	5.4	4.9	6.1	12.6
USSR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	++	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VENEZUEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2	++	1.2	1.1	0.5	0.0	0.0	++	++	0.1	0.1
NEI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.1	0.2	0.0	0.0	0.1	++	0.1	0.8	3.2
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	++	0.1	0.2	0.5	0.2	0.1	0.9	0.1	0.3	0.7	0.6	0.6	0.6	1.1	1.3	1.1	1.4	0.6	0.4	++	0.1	++	++	++
OTHER SURFA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.7	0.2	0.5	0.6	0.8	0.3	0.1	0.2	0.1	0.3	0.5	0.3	0.4	0.2	0.2
-LONGLINE	15.9	15.0	17.7	29.4	19.7	13.1	18.8	23.1	27.5	39.2	32.5	38.0	39.2	41.0	27.4	29.3	28.5	27.2	41.5	41.5	51.8	33.3	41.3	48.7	34.3	28.8	41.0	49.6	44.5	32.7
CHITAIW	++	++	++	0.0	0.6	2.2	5.3	7.5	7.6	5.5	5.0	3.8	3.1	4.0	3.3	3.0	2.6	2.2	2.3	1.7	1.9	1.4	0.8	1.1	1.0	1.3	1.3	0.7	4.9	0.8
CUBA	0.0	0.0	0.0	0.1	0.3	0.2	0.9	1.0	4.1	3.2	2.0	2.6	2.4	1.9	1.3	1.8	2.3	2.3	1.4	0.7	0.5	0.4	0.4	0.2	0.2	0.2	0.2	0.1	0.1	0.0
JAPAN	15.7	14.5	17.3	28.5	17.6	8.5	10.3	10.3	9.0	20.3	18.1	20.0	20.9	17.4	7.3	9.1	9.3	12.0	20.5	21.0	32.9	15.1	24.3	31.6	22.8	18.6	31.7	39.4	35.0	29.1
KOREA	0.0	0.0	0.0	0.0	0.3	0.3	0.3	1.9	4.1	7.4	5.7	5.8	7.4	10.2	6.7	7.6	9.2	7.3	9.0	11.7	10.6	9.4	8.9	10.7	6.1	4.4	4.9	7.9	2.7	0.8
PANAMA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.7	1.8	2.0	2.0	1.2	2.0	0.5	4.5	2.5	2.9	2.7	2.0	1.1	0.6	0.4	0.0	0.0	0.0	0.0
ESPANA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.5	1.4	0.0	0.0	0.0	++	0.3	0.1	++	++	++	0.0	0.0	0.0	0.5	0.5
USSR	0.0	0.0	0.0	0.4	0.7	1.8	1.7	2.2	2.6	2.7	1.6	3.0	3.4	3.7	4.9	4.1	2.1	2.0	2.6	1.7	0.6	0.4	1.2	0.9	1.1	1.9	1.1	0.4	0.1	0.0
VENEZUEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	0.5	0.2	0.3	0.3	1.5	1.0	2.4	2.0	1.7	0.9	0.1	0.1	++	++	++
OTHERS	0.2	0.5	0.4	0.4	0.2	0.1	0.3	0.2	0.1	0.1	++	0.1	0.2	0.3	0.4	0.6	0.8	0.6	0.9	0.7	1.1	1.4	1.7	1.4	1.6	1.9	1.7	1.1	1.2	1.5
-UNCL GEARS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	++	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1

++ CATCHES: < 50 MT AND >= 0.5

Countries whose annual catches have not exceeded 950 metric tons throughout the period covered are included in others.

BET-Table 2. Estimates from two non-equilibrium production models of bigeye tuna

Model 1 assumes constant catchability for the entire period
Model 2 assumes that catchability is constant within each of the two periods, 1961-1984 and 1985-1990

Parameter	Time period	Model 1	Model 2
MSY	1961-1990	74,000 MT	61,200 MT
Opt. effort	1961-1990	471 M hooks	--
	1961-1984	--	379 M hooks
	1985-1990	--	244 M hooks
Catchability coefficient, q	1961-1990	0.0018	--
	1961-1984	--	0.0014
	1985-1990	--	0.0022
B(91) / B(MSY)*	--	1.33	0.96
F(90) / F(opt)**	--	0.69	1.15

* Estimated ratio of the biomass at the start of 1991 to the optimum biomass (biomass that can support MSY)

** Estimated ratio of the fishing mortality rate in 1990 to the optimum rate (rate that provides MSY from the optimum biomass)

SKJ-Table 1. Atlantic skipjack annual catches (in 1000 MT) by east and west Atlantic and by major gears.

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
TOTAL	**11.2**	**20.1**	**18.7**	**24.2**	**22.8**	**24.2**	**48.4**	**29.2**	**50.1**	**78.4**	**77.4**	**78.3**	**117.3**	**56.3**	**68.7**	**108.8**	**106.3**	**88.4**	**108.7**	**129.0**	**153.2**	**132.8**	**126.3**	**118.0**	**124.2**	**115.9**	**139.9**	**115.8**	**138.7**	**195.5**
EAST ATLANTIC	9.2	16.1	13.2	22.6	21.0	21.4	45.8	27.3	47.5	76.2	74.4	75.0	113.3	52.2	64.8	105.4	99.1	81.8	96.0	105.9	120.1	100.6	90.9	77.8	89.8	90.1	116.7	90.3	114.0	163.5
-PURSE SEINE	0.0	0.4	0.9	3.3	6.1	7.9	24.2	14.3	29.8	48.8	48.8	49.8	74.2	35.4	32.5	55.9	56.8	35.6	54.0	64.5	72.5	63.6	61.7	47.7	58.1	50.6	67.3	47.3	73.0	118.7
CANADA	0.0	0.0	0.0	++	0.0	0.6	0.9	0.1	0.6	1.2	++	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CAYMAN I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.8	++	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CONGO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.2	0.0	++	++	++	++	++	++	++	++	++
FIS	0.0	0.2	0.5	0.9	2.2	1.5	5.1	2.6	7.8	13.1	13.6	7.9	22.6	10.5	14.3	26.7	20.7	13.9	19.9	22.4	24.3	25.2	9.1	9.7	10.9	15.2	14.2	11.1	12.9	30.0
GHANA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.1	0.0	0.0	0.0	0.3	2.7	3.9	2.8	3.7	2.9	1.7	0.8	0.0	0.0	0.0	0.0
JAPAN	0.0	0.0	++	1.8	1.4	2.2	6.3	0.7	3.5	6.2	3.4	1.5	0.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.4	1.4	1.1	2.1	2.0	2.0	3.2	2.2	2.6	4.8
MAROC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.7	1.9	1.9	5.0	3.0	4.0	2.3	0.9	1.0	1.2	0.9	0.0	0.0	0.1	++
ESPANA	0.0	0.2	0.4	0.6	2.5	3.1	8.7	6.2	6.1	11.9	19.5	17.8	30.6	16.9	15.6	21.5	24.5	17.4	24.2	31.3	34.7	27.6	44.6	29.4	39.5	29.7	44.2	29.5	43.2	65.2
USA	0.0	0.0	0.0	0.0	0.0	0.5	3.2	4.7	11.8	16.2	12.2	21.2	20.0	7.4	1.8	5.9	6.8	2.1	2.6	2.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
USSR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.1	++	0.0	1.5	0.6	1.0	1.4	1.7	0.5	1.8	1.9	3.6	1.2
NEI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	3.4	0.9	0.6	0.5	1.4	3.7	2.3	10.5	17.5
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.1	0.3	0.2	0.1	0.5	0.2	0.4	0.3	1.0	0.3	0.4	0.6	0.6	0.1	0.2	0.3	0.1	++
-BAITBOAT	9.2	15.7	11.8	19.2	14.9	13.5	21.6	12.9	17.6	27.2	25.3	25.0	39.0	16.7	28.6	42.4	41.4	44.7	38.0	38.9	44.5	34.8	27.9	29.9	30.1	38.5	48.1	41.6	39.5	43.9
ANGOLA	2.0	2.3	1.0	1.3	2.8	2.0	4.2	1.8	0.9	1.9	1.5	1.3	3.4	0.6	1.5	3.8	3.2	3.6	3.5	2.3	2.2	0.3	++	0.1	0.1	0.1	++	0.1	0.1	0.1
CAP VERT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.0	1.5	1.4	1.3	1.2	0.8	0.7	1.3	1.0	2.1	1.6	1.6	1.3	1.0	2.0	0.9	2.1	1.4	0.9	0.8	1.3
FIS	1.7	2.1	1.4	2.7	3.3	3.7	7.3	3.6	4.2	5.6	3.7	3.2	4.4	1.8	2.1	2.7	3.3	3.3	3.1	2.6	4.4	2.6	3.8	3.3	1.9	2.0	3.0	4.8	3.5	1.4
GHANA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	1.3	2.1	3.5	2.9	4.0	4.7	4.9	14.3	20.5	16.2	16.2	19.2	22.8	26.0	22.2	26.6	27.2
JAPAN	1.5	4.6	3.1	6.3	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	14.7	12.3	12.9	8.5	4.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
KOREA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	2.1	4.5	1.9	3.6	8.1	12.0	6.7	7.5	2.8	1.6	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0
MAROC	0.0	0.0	0.0	3.2	1.5	0.9	0.9	0.1	1.1	0.1	++	0.1	++	0.3	++	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PANAMA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.2	1.0	1.9	2.5	4.0	3.0	1.8	1.7	0.1	2.5	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PORTUGAL	2.3	3.4	3.1	2.2	2.3	2.5	1.1	1.7	1.0	4.2	3.7	2.2	1.9	0.6	2.1	4.4	4.4	3.0	1.7	2.7	4.8	1.0	3.8	2.4	5.4	8.0	14.1	7.7	3.9	8.0
ESPANA	1.7	3.3	3.2	3.5	0.6	0.7	0.8	0.8	1.8	2.7	4.1	2.6	5.4	0.8	0.6	0.7	0.6	1.3	2.2	4.2	3.4	1.3	2.0	5.7	2.5	3.4	3.4	5.8	4.6	5.9
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	++	0.0	0.0	0.0	0.0	++	0.1	++	++	++	++	0.1	0.1	0.2	0.1	++	++
-OTHER SURFAC	0.0	0.0	0.5	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.2	0.1	0.1	3.7	7.1	0.9	1.5	4.0	2.5	3.1	2.2	1.3	0.2	1.6	1.0	1.3	1.4	1.5	0.9
GHANA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.8	0.2	0.1	1.0	0.8	0.0	1.4	0.7	0.6	0.6	0.6	0.6
USSR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	6.7	0.5	1.1	3.0	1.8	2.5	0.7	0.0	0.0	++	0.0	0.0	0.0	0.0	0.0
OTHERS	+	++	0.5	0.1	0.0	++	++	0.1	0.1	0.2	0.3	0.2	0.1	0.1	0.1	0.4	0.4	0.1	0.2	0.5	0.5	0.5	0.5	0.2	0.2	0.3	0.7	0.8	0.9	0.3
WEST ATLANTIC	2.0	4.0	5.5	1.6	1.8	2.8	2.6	1.9	2.4	1.9	2.8	2.8	3.3	3.4	3.7	3.2	6.9	6.2	12.6	22.8	32.2	31.2	34.7	39.9	34.1	25.7	22.8	25.2	24.3	31.3
-PURSE SEINE	0.5	3.0	4.4	0.1	0.0	0.0	0.1	0.1	0.0	0.0	1.2	0.4	0.1	0.4	0.7	0.6	3.4	1.5	3.1	4.7	9.7	11.1	17.9	11.2	6.8	6.1	1.7	1.8	2.0	8.4
ESPANA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.3	1.0	0.8	0.0	0.0	0.0	0.2	2.6	0.5	0.0	0.0	0.0	0.0	0.0	1.6
USA	0.5	3.0	4.0	0.1	++	++	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.2	0.5	0.3	1.6	0.7	1.0	2.6	++	0.6	0.8	1.8	1.0	0.6	0.0	++	0.2	0.7
VENEZUEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	1.9	9.5	10.0	14.1	8.9	5.8	5.5	1.7	1.8	1.8	6.1
OTHERS	0.0	++	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.4	0.1	0.1	0.2	++	0.8	0.0	0.2	0.2	0.2	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0

SKJ-Table 1. Continued

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
-BAITBOAT	1.2	0.7	0.7	1.0	1.0	1.2	1.6	1.3	1.8	1.6	1.4	1.9	2.9	2.8	2.8	2.4	2.8	4.4	9.4	18.0	22.4	20.0	16.7	28.5	26.1	19.4	20.9	23.1	22.1	22.6
BRASIL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	6.1	13.9	18.2	15.6	13.1	25.1	22.5	16.2	17.2	20.5	20.0	20.4
CUBA	1.2	0.7	0.7	1.0	1.0	1.2	1.6	1.3	1.8	1.6	1.4	1.5	1.8	2.3	2.8	2.4	1.8	2.0	2.3	1.1	1.1	1.7	1.2	1.6	1.3	1.1	1.6	1.4	1.4	1.4
JAPAN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PANAMA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	0.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESPANA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VENEZUEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	0.1	0.0	0.0	0.0	0.0	0.0	3.0	3.1	2.7	2.4	1.8	2.3	2.1	2.1	1.2	0.7	0.8
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-OTHER SURFAC	0.3	0.3	0.4	0.5	0.8	1.6	0.9	0.5	0.6	0.3	0.2	0.5	0.3	0.2	0.2	0.2	0.7	0.3	0.1	0.1	0.1	0.1	0.1	0.2	1.2	0.2	0.2	0.3	0.2	0.3
BRASIL	0.3	0.3	0.4	0.5	0.7	1.5	0.8	0.4	0.4	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.6	0.2	0.0	0.0	0.0	0.0	++	++	0.6	0.1	0.1	0.2	0.1	0.1
OTHERS	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.5	0.3	0.2	0.1	++	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.6	0.1	0.1	0.1	0.1	0.1
LL+TRAWL - ALL	0.0	0.0	++	++	++	++	++	++	++	0.1	0.1	0.1	0.2	0.2	++	0.1	0.1	++	++	0.1	++	0.6	++	++	++	++	++	++	0.1	++
UNCL GEARS - AL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.4	0.5	0.5	0.2	0.1	0.2	0.4	0.1	0.2	0.9	0.4	0.7	0.3	0.3	0.1	0.4	0.3	0.3	0.7

++ CATCHES: < 50 MT AND >= 1 MT

FOR EACH REGION-GEAR GROUP, COUNTRIES WITH < 950 MT ANNUAL CATCH DURING THE ENTIRE PERIOD COVERED ARE INCLUDED IN OTHERS.

ALB-Table 1. Albacore nominal catches (in 1000 MT) by gear and country in the Atlantic and Mediterranean Sea.

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
TOTAL	77.1	77.3	90.3	90.7	75.2	74.9	71.8	76.4	70.4	83.0	83.3	75.8	72.5	59.5	77.0	75.2	72.1	73.3	61.3	59.0	72.3	66.8	56.0	72.9	86.2	80.2	65.4	61.6	66.6	51.5
NORTH ATL.	58.2	60.0	64.4	60.4	47.4	58.5	45.6	47.3	46.3	57.6	49.3	47.1	52.3	41.3	57.2	53.0	48.4	50.0	38.2	33.9	42.0	51.1	39.6	40.4	47.3	37.8	33.7	32.2	36.3	24.7
-SURFACE	52.4	45.3	48.5	45.7	39.6	48.9	37.9	32.5	30.2	39.7	34.7	28.9	37.7	28.7	34.3	32.1	34.3	37.8	28.8	24.2	28.8	34.4	20.0	23.4	26.2	30.6	30.8	29.9	33.8	22.2
BAITBOAT	21.4	20.7	20.5	20.1	16.8	18.3	13.9	14.6	14.4	15.7	8.2	10.2	16.7	19.2	20.4	15.6	11.8	15.7	16.2	13.4	15.9	21.2	8.3	12.6	15.1	18.7	16.8	15.4	18.6	9.0
FRANCE	7.7	6.4	6.8	4.2	3.5	3.9	2.2	1.7	1.7	1.5	0.5	1.1	0.6	0.7	1.1	0.6	0.4	0.2	0.4	0.4	0.2	0.2	++	0.1	0.1	0.1	0.0	0.3	0.0	0.0
PORTUGAL	0.6	1.0	0.5	0.8	0.3	0.7	0.1	0.5	0.2	0.3	0.4	0.9	1.2	0.9	0.6	0.1	0.1	0.1	0.1	0.4	0.3	1.8	0.8	0.6	0.4	0.4	0.2	0.2	3.2	0.7
ESPANA	13.1	13.3	13.2	15.1	13.0	13.7	11.6	12.4	12.5	13.9	7.3	8.2	14.9	17.6	18.7	14.9	11.3	15.4	15.7	12.6	15.3	19.0	7.4	11.8	14.6	18.2	16.6	14.9	15.4	8.3
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	++	0.0	0.0	0.0	++	++
TROLLING	31.0	24.6	28.0	25.6	22.8	30.6	24.0	17.9	15.8	24.0	26.5	18.7	21.0	9.5	13.9	16.5	22.5	22.0	12.6	10.7	12.8	12.8	11.0	10.7	10.9	11.4	11.4	10.6	10.3	9.0
FRANCE	12.6	9.8	12.7	11.4	10.0	11.6	11.0	7.7	4.5	7.7	8.7	5.8	7.9	5.0	5.7	6.2	8.4	7.8	3.1	2.5	2.7	2.2	2.8	1.8	1.1	1.4	0.4	0.1	0.0	0.0
ESPANA	18.4	14.8	15.3	14.2	12.8	19.0	13.0	10.2	11.3	16.3	17.8	12.9	13.1	4.5	8.2	10.3	14.1	14.2	9.5	8.2	10.1	10.6	8.2	8.9	9.8	10.0	11.0	10.5	10.3	9.0
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	++
OTHER SURFACE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.4	0.7	0.1	0.2	0.5	2.6	3.9	4.9	4.2
CHITAIW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0
FRANCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.4	3.7	3.3	4.1
VENEZUEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.6	0.1	++	0.0	0.1	++	++	0.0
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	0.0	0.1	++	0.1	++	++	0.1	++	0.2	0.2	0.1	0.2	0.2	0.1
-LONGLINE	5.8	14.7	15.9	14.7	7.8	9.6	7.7	14.8	16.1	17.9	14.6	18.2	14.6	12.6	22.9	20.9	14.1	12.2	9.4	9.7	13.2	16.7	19.6	17.0	21.1	7.2	2.9	2.3	2.5	2.5
CHITAIW	++	++	0.1	0.1	0.2	0.8	1.9	2.4	4.7	2.9	4.4	9.5	9.5	8.1	14.8	13.7	9.3	7.0	7.1	6.6	10.5	14.3	14.9	14.9	19.6	6.6	2.1	1.3	1.5	1.6
CUBA	0.0	0.0	0.0	0.1	0.2	0.1	0.3	0.1	0.0	0.0	++	0.0	0.0	0.1	0.1	0.1	0.1	0.0	++	++	0.1	++	0.1	++	++	++	++	0.0	++	0.0
JAPAN	5.7	14.6	15.7	14.3	5.9	4.8	3.3	4.7	5.9	6.5	1.3	1.5	2.1	1.3	1.3	0.8	0.5	1.2	1.0	1.7	0.8	1.2	0.6	0.8	0.5	0.5	0.7	0.8	0.7	0.7
KOREA	0.0	0.0	0.1	0.2	1.5	3.9	1.6	6.8	5.0	7.7	7.9	4.8	2.8	2.8	5.4	5.6	3.0	3.0	0.8	0.9	1.3	0.5	1.0	0.4	0.4	++	++	0.1	++	++
PANAMA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.4	0.2	0.2	1.2	0.6	0.8	0.4	0.2	0.2	0.5	0.4	2.6	0.6	0.5	++	0.0	0.0	0.0	0.0
VENEZUEL	0.1	0.1	0.0	0.0	0.0	0.0	0.6	0.8	0.5	0.8	0.8	0.0	0.0	0.1	0.1	0.1	0.4	0.6	0.3	0.3	++	0.3	0.4	0.3	0.1	++	++	++	0.1	++
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	0.0	++	++	++	++	0.1	0.1	0.1	0.2	0.2
-UNCL + TRAWL G	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	0.0	++	0.0	0.0	0.0	++	0.0	++	0.0	++	++	0.0	0.0	0.0	0.0	0.0	0.0	++	++
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	0.0	++	0.0	0.0	0.0	++	0.0	++	0.0	++	++	0.0	0.0	0.0	0.0	0.0	0.0	++	++

ALB-Table 1. Continued

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
SOUTH ATL.	18.9	17.3	25.9	29.8	27.3	15.9	25.7	28.4	23.6	24.9	33.3	28.2	19.7	17.7	19.3	21.6	23.1	22.5	22.6	23.6	29.0	14.5	13.1	28.3	35.1	38.3	27.6	25.3	28.7	24.8
-SURFACE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.0	0.4	0.2	0.7	2.0	3.2	3.8	2.5	3.2	5.6	4.9	6.8	5.4	5.5	5.1	2.7
BRASIL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	++	0.1	0.1	++	0.1	0.1	0.3	0.1	++	0.1	++	++	++	++
CHITAIW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0
FIS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	0.1	++	0.2	0.5	0.9	0.9	0.4	++	++	++	0.1	0.0	0.0	0.0	0.0
SAFRICA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	++	0.1	0.1	0.4	1.2	1.4	2.5	1.7	2.6	5.3	4.7	5.8	5.2	5.5	4.2	2.7
ESPANA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.1	0.3	0.3	0.2	0.2	0.8	0.2	0.0	0.0	0.0
OTHERS	0.0	0.0	++	0.0	0.0	0.0	++	0.0	0.0	0.0	0.0	++	0.0	++	0.0	0.1	0.1	++	0.2	++	0.2	++	++	0.0	0.0	++	++	++	++	++
-LONGLINE	17.1	17.3	25.9	29.8	27.3	15.9	25.7	28.4	23.6	24.9	33.2	28.1	19.6	17.5	19.3	21.2	22.9	21.8	20.6	20.4	25.2	11.9	9.7	22.5	29.8	31.0	21.9	19.4	23.4	21.9
ARGENTIN	0.7	1.5	1.5	1.1	0.8	0.7	1.2	0.4	0.5	0.3	0.1	++	++	0.1	++	0.1	++	0.0	++	++	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BRASIL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	++	0.1	0.2	0.2	0.3	0.5	0.5	0.4	0.4	0.3	0.7	0.7	0.5	0.3	0.5	0.3	0.4	0.4	0.5	0.2
CHITAIW	0.0	0.0	0.0	0.0	0.0	1.1	6.8	12.5	12.2	17.5	25.0	22.2	16.7	13.4	14.6	16.1	20.5	20.3	18.7	18.2	22.8	9.5	7.9	19.6	27.6	28.8	20.7	18.4	22.2	20.3
JAPAN	16.4	15.1	23.7	28.3	21.0	7.7	11.9	6.3	5.9	3.2	2.1	0.3	0.1	0.3	0.1	0.1	0.1	0.1	0.3	0.6	0.6	0.2	0.2	0.6	0.7	0.4	0.4	0.4	0.6	0.6
KOREA	0.0	0.0	0.1	0.3	5.3	6.4	5.7	9.2	5.0	3.8	5.7	3.7	2.4	3.2	3.4	3.8	1.4	0.9	0.7	0.7	0.6	0.6	0.3	0.5	0.3	0.4	0.2	0.1	++	++
PANAMA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.8	0.2	0.3	0.8	0.4	0.4	0.1	0.2	0.1	0.2	0.0	0.0	0.0	0.3	0.9	0.0	0.0	0.0	0.0
SAFRICA	0.0	0.7	0.6	++	0.1	0.0	0.0	0.0	0.0	0.0	0.0	++	0.0	0.0	0.0	0.0	0.0	++	0.3	0.4	0.1	0.5	0.2	++	0.1	0.0	0.1	0.0	0.0	0.0
URUGUAY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	0.2	0.4	0.5	1.5	0.3	0.2	0.1	0.1	0.1	++
OTHERS	0.0	0.0	0.0	0.1	0.1	++	0.1	++	0.0	0.0	0.1	0.0	0.0	++	0.1	0.2	++	0.0	++	0.1	++	++	0.1	++	++	++	++	++	++	0.0
BRASTAI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
-UNCL + TRAWL G	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.4	0.5	0.3	0.4	0.2	0.2
ARGENTIN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	0.1	0.2	0.2	0.4	0.5	0.3	0.4	0.2	0.2
SAFRICA	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MEDIT.	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.7	0.5	0.5	0.7	0.5	0.5	0.5	0.5	0.6	0.6	0.8	0.5	1.5	1.3	1.2	3.3	4.2	3.8	4.1	4.1	4.1	1.6	2.0
-SURFACE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.6	0.5	1.6	1.2	0.1	0.2	0.1	0.1	0.2	0.6
FRANCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	++	0.1	++	++	0.1	0.1
ITALY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.1	0.1	0.1	0.1	0.0	0.0
ESPANA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.6	0.5	1.3	0.5	0.0	0.0	0.0	0.0	0.1	0.5
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.2	0.2	0.2	0.2	0.0	0.0
ITALY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.2	0.2	0.2	0.2	0.0	0.0
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++.0	0.0	0.0	0.0	++.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++.0	0.0	0.0	0.0

ALB-Table 1. Continued

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
-UNCL + TRAWL G	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.5	0.5	0.5	0.5	0.5	0.4	0.8	0.5	0.6	0.7	0.7	1.5	2.6	3.5	3.7	3.8	3.8	1.4	1.4
GREECE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.5
ITALY	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.8	0.5	0.6	0.7	0.7	1.5	2.6	3.0	3.2	3.3	3.3	0.9	0.9
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

++ CATCHES: < 50 MT

For each region-gear group, countries with less than 950 MT annual catch during the entire period covered are included in "OTHERS"

ALB-Table 2. Nominal fishing effort for major North and South Atlantic albacore fisheries

YEAR	NORTH									SOUTH		
	BB SPAIN	BB FRANCE	TROL SPAIN	TROL FRANCE	GILL FRANCE	GILL TAIWAN	MWTD FRANCE	LL TAIWAN		LL TAIWAN		BB S. AFRICA
61	13.9	8.7	26.9	21.1								
62	12.7	7.4	42.1	28.9								
63	13.3	6.4	37.3	24.7								
64	12.3	6.3	35.0	29.0								
65	20.2	5.6	30.5	24.5								
66	15.0	4.0	37.1	28.9								
67	13.2	3.8	46.7	28.5								
68	16.1	3.0	37.6	31.8						19.8		
69	20.9	2.9	20.0	9.9						26.4		
70	14.9	2.0	27.5	11.0						21.2		
71	21.6	2.3	33.4	15.8						35.7		
72	11.6	0.8	30.4	14.8						39		
73	13.6	1.8	24.4	18.9						36		
74	11.6	0.5	23.7	12.1						32.4		
75	17.2	0.7	15.4	9.0				15.2		30.5		
76	21.6	1.2	20.0	9.9				30.0		42.2		
77	16.0	0.4	20.1	9.7				30.9		53.4		
78	16.0	0.4	22.5	12.0				20.0		48.8		
79	16.2	0.1	17.0	10.0				9.0		33.1		
80	16.4	0.3	16.7	11.2				14.3		40		
81	11.5	0.4	17.2	5.3				12.8		39.8		
82	10.9	0.1	17.2	6.0				19.8		47.8		
83	16.1	0.2	16.1	3.3				26.0		22.4		
84	7.2	0.0	12.4	4.2				32.7		16.9		
85	9.9	0.1	23.4	4.7				37.8		48.2		
86	12.8	0.1	20.7	2.3				60.1		68.7		
87	10.3	0.1	24.7	3.5				23.8		86.5		2.8
88	12.0	0.0	19.7	0.7	1.2		0.8	5.2		72.8		3.3
89	9.5	0.2	21.9	0.2	1.5		2.9	3.4		68.9		5.6
90	9.0	0.1	18.9	0.1	1.3	?	0.8	17.4	(10.0)	82.4	(7.5)	5.4
91	7.9	0.0	14.0	0.0	1.9		0.3	23.3	(17.8)	85.4	(36.3)	-

Units: Surface 1000 fishing days
LL million hooks
Values in ( ) refers to effort of deep longlines

ALB-Table 3a. Catch (in 100 fish) at age estimated by MULTIFAN for 1983-1991 and used for VPA of the North Atlantic albacore stock

YEAR	83	84	85	86	87	88	89	90	91
AGES									
1	8053	3362	10133	6840	2256	16262	9399	10621	10839
2	10061	10285	9863	14094	17185	19351	15117	21599	20945
3	14063	6580	9133	8137	15542	9369	11841	9890	5064
4	10407	6201	5395	9912	6144	6639	8097	4122	3040
5	3496	1333	1421	2181	728	501	299	1054	386
6	1987	1482	1536	2589	453	607	319	499	412
7	1215	980	1332	1690	436	345	207	690	247
8	1219	2197	1212	1376	436	271	146	709	282
9	313	611	494	401	175	145	114	338	240
10	186	169	260	800	172	105	91	159	121
11+	326	686	591	275	268	101	88	143	116
TOTAL	51326	33886	41370	48295	43795	53696	45718	49824	41692

ALB-Table 3b. Catch (in 100 fish) at age estimated by MULTIFAN, 1975-1991 for North Atlantic albacore stock

Year	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91
Ages																	
1	2452	7204	3017	23830	6334	16361	9316	783	7863	2449	10238	6800	1691	16249	7904	10621	10839
2	6809	22375	22535	26600	34183	11377	11653	12785	10477	10514	9986	14182	17506	19648	15925	21599	20945
3	12124	4676	11562	7600	14687	17862	11542	16003	14585	7661	9540	9132	16640	10306	13202	9890	5064
4	5055	9827	9227	12368	8294	6579	5735	8776	10133	5782	4830	9130	5356	5422	7340	4122	3040
5	1898	4962	1671	2497	883	2015	1407	927	3214	1425	1440	2275	572	484	283	1054	386
6	2820	4548	4888	2125	1219	611	751	758	1821	1354	1531	2315	466	551	312	499	412
7	1780	2417	2039	1956	1082	520	427	611	1278	1101	1329	1838	493	368	226	690	247
8	1821	1267	972	688	674	486	494	911	1130	2338	1197	1078	388	257	173	709	282
9	218	295	309	240	327	214	324	447	255	330	350	501	198	154	126	338	240
10	140	183	191	206	318	179	174	271	199	177	282	760	194	131	115	159	121
11	126	161	169	204	396	307	246	422	369	757	642	286	290	129	114	143	116
TOTAL	35240	57912	56580	78316	68396	56510	42072	42697	51324	33886	41369	48295	43794	53699	45720	49824	41692

1/ The 1975-1982 numbers should be considered provisional, as they may contain some minor errors.
2/ Numbers by age class differ slightly between Alb-Tables 3a and 3b for a given year.
It can be attributed to the conditions of use of MULTIFAN (see SCRS/92/48).

ALB-Table 4. Annual catch of the south Atlantic albacore stock and estimated effective effort from two CPUE indices based on the Taiwanese fishery, standardized by Honma and GLM methods, 1968-1991

Year	Total catch (1000MT) (a)	CPUE (No./100 hooks) adjusted by Honma (b)	CPUE (No./100 hooks) adjusted by GLM (c)	Mean weight (kg) (d)	CPUE (Kg/100 hooks) adjusted by Honma (e)=(b)x(d)	CPUE (Kg/100 hooks) adjusted by GLM (f)=(c)x(d)	Effective effort (million hooks) Honma (a)/(e)	Effective effort (million hooks) GLM (a)/(f)
1968	25.7	1.28	2.56	14.2	18.18	36.35	141.36	70.7
1969	28.4	1.14	3.27	15.7	17.90	51.34	158.66	55.3
1970	23.6	1.05	3.21	15.7	16.49	50.40	143.12	46.8
1971	24.9	1.21	3.79	15.2	18.39	57.61	135.40	43.2
1972	33.3	1.03	2.79	14.7	15.14	41.01	219.95	81.2
1973	28.2	0.94	2.20	13.8	12.97	30.36	217.42	92.9
1974	19.7	0.98	2.37	14.9	14.60	35.31	134.93	55.8
1975	17.7	1.18	2.55	14.6	17.23	37.23	102.73	47.5
1976	19.3	1.20	2.60	12.8	15.36	33.28	125.65	58.0
1977	21.6	1.12	2.56	14.4	16.13	36.86	133.91	58.6
1978	23.1	1.26	2.80	13.6	17.14	30.08	134.77	76.8
1979	22.5	1.14	2.96	13.6	15.50	40.26	145.16	55.9
1980	22.6	1.15	2.91	14.6	16.79	42.49	134.60	53.2
1981	23.6	0.99	1.99	15.0	14.85	29.85	158.92	79.1
1982	29.0	0.97	2.01	14.4	13.97	28.94	207.59	100.2
1983	14.5	1.00	2.12	13.7	13.70	29.04	105.84	49.9
1984	13.1	1.12	2.41	14.8	16.58	35.67	79.01	36.7
1985	28.3	1.00	2.45	13.9	13.90	34.06	203.60	83.1
1986	35.1	1.04	2.50	13.7	14.25	34.25	246.32	102.5
1987	38.3	0.82	2.02	14.4	11.81	29.09	324.30	131.7
1988	27.6	0.68	1.73	14.8	10.06	25.60	274.35	107.8
1989	25.3	0.59	1.58	15.8	9.32	24.96	271.46	101.4
1990	28.7	0.63	1.30	14.4	9.07	18.72	316.43	153.3
1991	24.8	0.50	1.06	16.5	8.25	17.49	300.61	141.8

BFT-Table 1. Total annual catches (in MT) of bluefin tuna in the east and west Atlantic and Mediterranean Sea, by major gears

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
TOTAL	33823	29318	35213	31002	22706	25207	15738	17385	15924	17461	14485	14532	23547	26103	28168	25468	20409	18478	19894	19607	23797	24239	26731	26921	22647	20473	27064	24547	24710	24413
WEST ATLANTIC	5799	13838	18679	14171	8090	5940	3176	3012	5466	6591	3948	3871	5393	5032	5883	6694	5763	6255	5801	5771	1431	2559	2292	2709	2357	2650	3059	2920	2787	2858
-PURSE SEINE	3768	5770	5158	3331	1006	2082	687	1118	4288	3769	2011	1656	960	2320	1582	1502	1230	1381	758	910	232	384	401	377	360	367	383	385	384	237
CANADA	0	323	579	461	0	0	0	0	1161	935	260	635	103	291	332	298	241	0	0	105	0	0	0	0	0	0	0	0	0	0
NORWAY	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USA	3768	5447	4571	2870	1006	2082	687	1118	3127	2834	1751	1021	857	2029	1250	1204	989	1381	758	805	232	384	401	377	360	367	383	385	384	237
-ROD-REEL & SPOR	380	1162	601	1062	3726	343	619	1008	587	1049	1084	519	2913	328	590	630	475	499	535	523	308	476	401	466	328	539	439	557	754	711
CANADA	40	90	99	94	111	56	180	170	151	88	188	239	409	206	342	302	208	214	259	279	0	71	1	1	2	1	7	0	2	15
USA	340	1072	502	968	3615	287	439	838	436	961	896	280	2504	122	248	328	267	285	276	244	308	405	400	465	326	538	432	557	752	696
-LONGLINE	1351	6558	12410	9469	3085	3126	1665	593	268	1390	339	1127	946	1522	3066	3752	3217	3691	3972	3879	349	846	835	1269	1313	1385	1636	979	896	969
ARGENTIN	106	271	204	100	100	60	21	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BRASIL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	10	2	3	1	1	++	1	0	2	++	2	1	0
CANADA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	33	104	53	23	13
CHITAIW	0	0	0	0	0	0	12	7	2	13	7	2	20	1	0	1	1	49	15	7	11	19	3	28	38	59	48	69	8	7
CUBA	0	0	0	139	465	2352	1351	468	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NEI-1																						1						14	21	21
JAPAN	1219	6191	12044	9147	2471	694	272	116	66	1375	321	1097	905	1513	2902	3658	3144	3621	3936	3771	292	711	696	1092	584	960	1109	468	550	551
KOREA	0	0	0	0	0	0	0	0	0	0	11	23	20	8	7	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
NORWAY	0	0	63	4	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PANAMA	0	0	0	0	0	0	0	0	0	0	0	2	0	0	157	92	58	10	9	14	12	0	0	0	0	0	0	0	0	0
URUGUAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	9	16	6	0	2	0	0	1
USA	26	96	99	79	39	20	9	2	0	++	0	1	1	0	0	0	0	0	10	83	30	114	127	132	653	331	373	373	293	376
-OTHER & UNCL	300	348	510	309	273	389	205	293	323	383	514	569	574	862	645	810	841	684	536	459	542	853	655	597	356	359	601	999	753	941
ARGENTIN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	2	++	1	2	2
CANADA	137	229	318	81	87	174	101	193	130	59	29	144	256	144	172	372	221	31	65	41	291	362	263	141	39	49	282	580	397	453
MEXICO	0	0	0	0	0	0	0	0	0	0	23	29	39	24	37	14	28	22	10	20	14	0	0	0	0	0	0	0	0	0
POLAND	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STLUCIA	0	0	0	0	0	0	0	0	**	**	**	**	**	**	**	**	**	**	0	0	0	0	0	0	0	++	3	2	14	14
USA	163	119	192	228	186	215	104	100	193	324	462	396	276	694	433	424	592	631	461	398	237	491	392	450	317	308	316	416	340	472
EAST ATLANTIC	23230	9020	10239	10834	9290	10523	4629	5683	5764	4675	4732	4685	6067	9976	5212	6977	5800	4767	4064	3331	6669	8010	7392	4759	4328	4209	6759	5319	5913	5276
-BAITBOAT	1557	1178	1079	1820	3347	1805	1474	1826	3017	3055	3032	3142	2348	2991	1803	2881	3904	2128	1874	1553	957	3032	2948	2366	2253	2128	2682	2683	1993	1648
CAP VERT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	1	0	0	0	0	0	0	0
FRANCE	965	543	400	621	1624	860	390	534	732	680	740	540	522	692	267	592	723	275	260	153	150	400	566	380	272	533	479	306	367	448
JAPAN	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PORTUGAL	0	0	0	0	0	0	0	0	0	0	0	0	191	303	24	14	56	10	17	16	30	53	15	3	28	58	29	1	12	0
ESPANA	572	635	676	1199	1723	945	1084	1292	2285	2375	2292	2602	1635	1996	1512	2275	3125	1843	1597	1384	777	2569	2366	1983	1953	1537	2174	2376	1614	1200

BFT-Table 1. Continued

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
-PURSE SEINE	9781	1575	3458	3378	2737	4022	1149	1435	669	598	961	932	1455	3612	860	1426	257	266	437	266	655	262	414	86	288	0	0	0	8	4
MAROC	1628	1419	2059	906	1778	2048	453	678	406	30	531	512	590	2624	331	662	36	206	155	105	600	187	127	86	122	0	0	0	8	4
NORWAY	8153	156	1390	2472	959	1974	696	757	263	568	430	420	865	988	529	764	221	60	282	161	50	1	243	0	31	0	0	0	0	0
PORTUGAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	3	0	123	0	0	0	++	0
SAFRICA	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ESPANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41	0	12	0	0	0	0	0
USA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
-TRAP	9014	4472	5059	5172	3123	4540	1790	2220	1786	663	372	505	20	448	490	561	450	600	706	859	2309	1956	2271	1630	891	1062	2424	1478	2139	1799
MAROC	3648	2318	2256	1882	1601	1331	635	59	286	63	122	1	7	0	0	222	0	0	6	72	393	94	0	0	0	123	35	304	228	759
PORTUGAL	666	354	303	90	122	209	55	261	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ESPANA	4700	1800	2500	3200	1400	3000	1100	1900	1500	600	250	504	13	448	490	339	450	600	700	787	1916	1862	2271	1630	891	939	2389	1174	1911	1040
-LONGLINE	2484	1618	582	434	81	141	208	201	274	254	261	91	2243	2923	2048	1806	733	748	1002	575	2705	2626	1538	535	772	914	1183	853	1551	1657
CHITAIW	0	0	0	0	0	0	138	114	46	12	2	1	12	5	3	2	0	3	5	6	16	2	0	0	2	10	14	0	47	6
JAPAN	2484	1618	582	404	50	100	13	2	21	157	240	44	2195	2900	1973	1594	577	630	880	515	2573	2609	1514	420	739	900	1169	838	1464	1612
KOREA	0	0	0	0	0	0	0	0	0	0	19	43	36	15	3	2	0	1	0	0	0	3	0	77	0	0	0	0	0	0
MAROC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	2
NORWAY	0	0	0	30	31	41	57	85	207	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PANAMA	0	0	0	0	0	0	0	0	0	0	0	3	0	0	69	208	156	14	117	48	12	0	17	22	11	4	**	**	**	**
POERTUGAL																														5
ESPANA	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	100	0	6	104	12	7	16	20	0	0	15	32	32
-OTHER & UNCL	414	177	61	30	2	15	8	1	18	105	106	15	1	2	11	303	456	1025	45	78	43	134	221	142	124	105	470	305	222	168
DENMARK	202	4	61	30	2	15	8	1	++	1	++	2	1	++	3	1	3	1	0	4	++	++	0	2	1	++	0	0	++	++
FRANCE	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	36	110	76	0	245	154	143	117
GERFR	212	++	++	++	++	0	++	++	14	1	6	2	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0
GREECE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	++	5	0	0	0	0	0	0	0	0	0
NEI-1																							6	3	5			5	5	2
MAROC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	44	0	0	0	202	144	59	30
NETHERLA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	++	++	++	++	++	++	++	++	++	++
NORWAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	++	0	0	0	0	0	0	0	0	0	0
POLAND	0	0	0	0	0	0	0	0	0	100	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PORTUGAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	7	1	11	47	16	26	42	105	19	2	15	18
ESPANA	0	173	0	0	0	0	0	0	0	0	0	0	0	0	0	300	450	998	38	70	27	2	119	1	0	0	4	0	0	0
SWEDEN	++	++	0	++	++	++	++	0	4	3	0	0	0	2	8	2	2	++	++	1	++	1	++	0	0	0	++	++	0	1
MEDITERRANEAN	4794	6460	6295	5997	5326	8744	7933	8690	4694	6195	5805	5976	12087	11095	17073	11797	8846	7456	10029	10505	15697	13670	17047	19453	15962	13614	17246	16308	16010	16279
-PURSE SEINE	419	1533	1261	435	1876	2919	3341	3629	2393	3904	4084	4324	8119	8065	13970	9563	7299	6103	8541	8529	12131	10484	9888	13408	10788	8755	11365	10512	11084	11604
FRANCE	0	0	0	0	1000	1500	2500	1500	1100	2200	1100	1400	1800	1600	3800	3182	1566	1527	1701	2300	4818	3600	3570	5400	3460	4300	5750	4404	4663	4570
ITALY	332	1256	990	301	630	1088	691	1828	1203	1336	2783	2700	6000	6270	9607	5431	4663	3705	6120	5704	6442	5552	5382	4522	4789	2579	2229	2345	2576	2430

BFT-Table 1. Continued

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
MAROC	0	0	0	0	0	0	0	0	0	42	1	0	2	40	1	7	0	2	++	2	++	0	0	0	0	0	0	0	0	0
ESPANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	277	0	79	45	110	170	160	300	635	807
TUNISIE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	21	113	147	97	108	110	102	127	109	148	153	94	114	1073
TURKEY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2230	1524	910	1550	2809	2137	2137
YUGOSLAV	87	277	271	134	246	331	150	301	90	326	200	224	317	155	562	932	1049	756	573	376	486	1222	755	1084	796	648	1523	560	940	0
CROATIA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	538
NEI**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	49
-TRAP	2861	2059	3081	3872	2250	3337	3082	3768	1394	1340	1016	566	893	799	719	820	331	326	545	587	1364	1048	1962	760	645	913	1034	1311	1545	639
ALGERIE	**	++	++	++	150	150	150	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ITALY	1280	1227	1652	1264	945	1949	1739	1324	961	1044	835	367	739	713	650	698	210	195	152	209	155	284	327	295	293	310	301	301	246	350
LIBYA	800	100	400	600	700	800	1000	2000	0	0	0	0	0	0	0	0	0	0	339	255	130	0	0	0	0	0	0	0	0	0
MAROC	0	0	0	172	11	27	5	0	0	37	36	1	7	0	0	0	0	0	0	0	0	0	0	0	0	110	96	286	580	22
ESPANA	377	472	653	1235	151	104	4	217	280	53	88	146	11	3	3	2	1	0	0	3	66	37	621	302	168	219	228	231	470	24
TUNISIE	404	260	376	601	293	307	184	77	153	206	57	52	136	83	66	120	120	131	54	120	188	170	145	163	184	274	409	493	249	243
TURKEY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	825	557	869	0	0	0	0	0	0	0
-LONGLINE	0	800	300	400	500	300	600	400	69	129	236	520	2387	1363	1218	592	153	199	219	300	1501	939	1164	1268	622	701	1094	679	420	1413
ITALY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	41	62	1	65	63	63	60	70
JAPAN	0	0	0	0	0	0	0	0	0	0	112	246	2195	1260	968	520	61	99	119	100	961	677	1036	1006	341	280	258	127	172	83
MALTA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	63
MAROC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
PANAMA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ESPANA	0	800	300	400	500	300	600	400	69	129	124	274	192	103	250	68	92	100	100	200	538	233	69	129	117	116	135	98	59	51
NEI-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	18	71	163	240	638	391	128	1146
-OTHER & UNCL	1514	2068	1653	1290	700	2188	910	893	838	822	469	566	688	868	1166	822	1063	828	724	1089	701	1199	4033	4017	3907	3245	3753	3806	2961	2623
ALGERIE	0	0	0	0	0	0	0	0	100	100	1	++	33	66	49	40	20	150	190	220	250	252	254	260	566	420	677	820	782	782
FRANCE	214	668	953	390	0	0	0	0	0	0	0	0	0	0	0	0	31	51	0	50	60	60	30	30	30	30	30	30	50	50
GREECE	1000	1200	600	700	500	600	500	500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	131	99	102	131	155	79
ITALY	0	0	0	0	0	0	0	0	100	100	100	100	100	100	112	134	110	120	0	104	61	0	1390	2320	2493	1653	1608	1608	1118	1045
LIBYA	0	0	0	0	0	0	0	0	500	600	300	400	500	634	799	336	677	424	59	16	180	300	300	300	300	300	300	84	100	100
MALTA	100	100	100	100	100	100	100	++	++	++	++	++	21	37	25	47	26	23	24	32	40	31	21	21	41	36	25	34	49	0
MAROC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	12	18	0	44	9	6	7
ESPANA	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	88	72	15	33	101	108	542	1974	984	306	673	905	1016	658	510
TUNISIE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	27	1	2	13	60	79	22	34	62	74	43	50
TURKEY	200	100	0	100	100	1488	310	393	138	22	68	66	34	17	181	177	127	27	391	565	0	0	0	0	0	0	0	0	0	0

++ CATCH: < 0.5 MT
** CATCH: UNKNOWN

BFT-Table 2. Size data availability for east Atlantic catches (NO=data not available, YES=data available)

YEA	EAST ATLANTIC				MEDITERRANEAN				TOTAL EAST			
	MT		%		MT		%		MT		%	
	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
1970	2608	3156	45.2	54.8	2353	2341	50.1	49.9	4961	5497	47.4	52.6
1971	2343	2332	50.1	49.9	2898	3297	46.8	53.2	5241	5629	48.2	51.8
1972	2880	1852	60.9	39.1	4505	1300	77.6	22.4	7385	3152	70.1	29.9
1973	2441	2244	52.1	47.9	4184	1792	70.0	30.0	6625	4036	62.1	37.9
1974	2770	3297	45.7	54.3	8081	4006	66.9	33.1	10851	7303	59.8	40.2
1975	5610	4366	56.2	43.8	4048	7047	36.5	63.5	9658	11413	45.8	54.2
1976	2069	3143	39.7	60.3	12121	4952	71.0	29.0	14190	8095	63.7	36.3
1977	2469	4508	35.4	64.6	3758	8039	31.9	68.1	6227	12547	33.2	66.8
1978	1198	4602	20.7	79.3	3997	4849	45.2	54.8	5195	9451	35.5	64.5
1979	511	4256	10.7	89.3	1973	5483	26.5	73.5	2484	9739	20.3	79.7
1980	543	3521	13.4	86.6	4715	5314	47.0	53.0	5258	8835	37.3	62.7
1981	461	2870	13.8	86.2	5713	4792	54.4	45.6	6174	7662	44.6	55.4
1982	1236	5433	18.5	81.5	6261	9436	39.9	60.1	7497	14869	33.5	66.5
1983	889	7138	11.1	88.9	7510	6160	54.9	45.1	8399	13298	38.7	61.3
1984	870	6522	11.8	88.2	8248	8799	48.4	51.6	9118	15321	37.3	62.7
1985	839	3920	17.6	82.4	6974	12479	35.9	64.1	7813	16399	32.3	67.7
1986	651	3677	15.0	85.0	7333	8629	45.9	54.1	7984	12306	39.3	60.7
1987	830	3379	19.7	80.3	5723	7891	42.0	58.0	6553	11270	36.8	63.2
1988	997	5762	14.8	85.2	5797	11449	33.6	66.4	6794	17211	28.3	71.7
1989	914	4405	17.2	82.8	6600	9708	40.5	59.5	7514	14113	34.7	65.3
1990	892	5021	15.1	84.9	10331	5660	64.6	35.4	11223	10681	51.2	48.8
1991	1392	3884	26.4	73.6	10942.1	4750	69.7	30.3	12334.1	8634	58.8	41.2

BFT-Table 3. Estimated east Atlantic and Mediterranean catch at age as used in the base case assessment

Number of fish

Age	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
0	47310	176316	37774	94175	147154	165497	98361	254810	191316	52861	54015
1	131718	10520	116581	142935	187116	696771	96878	217545	151715	75632	111411
2	76235	88641	148601	66884	130118	289275	188236	289457	194104	33969	164497
3	26881	53183	77235	83721	57043	34843	281023	45387	152611	101914	124017
4	16341	14687	11360	6258	63074	19900	39694	64050	19182	50033	30598
5	9845	12399	8281	3314	7325	6046	20424	2332	5166	7012	9119
6	8217	3651	7085	3314	4813	4370	5059	5261	1547	2414	4640
7	4541	4470	4239	6746	2893	3206	3175	3984	2875	2293	3075
8	3550	9689	2293	7907	4389	3335	2030	2461	1799	3939	2276
9	5576	5632	3290	8516	10577	5370	3794	2499	1224	3659	2376
10	6245	1616	1052	1665	5013	5127	2588	3116	3421	3564	3409
11	6584	1415	1107	1493	3658	5576	3521	3652	2013	2519	3915
12	4096	1221	1334	1607	4533	7527	4004	3277	2292	1525	3159
13	2254	1841	2168	2023	6265	9868	6844	4287	3148	2432	3349
14	2088	2777	2568	2267	5706	7950	5093	4419	2586	2944	3145
15	3498	9350	7267	7551	14270	18078	17080	17444	13312	9810	7482
Total	354979	397408	432235	440386	653947	1282739	777804	923981	748311	356520	530483

Number of fish

Age	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
0	35240	76175	342313	1688	389092	588253	94622	29721	19583	171226	101045
1	149769	700457	706902	172843	216810	624402	259574	817094	461925	528783	307466
2	339497	226063	169902	643019	358919	273769	445344	170042	421253	368009	415925
3	111212	191496	121271	48831	316509	167405	109512	249683	89294	209213	146599
4	13009	23556	24954	36448	31820	74981	30335	29439	64369	57101	38368
5	14863	5342	12518	19559	13306	8281	9773	9468	37761	27268	18674
6	5657	3283	3359	10175	9013	5680	7724	10092	6685	7924	6315
7	3833	5211	9860	6222	4126	2751	8292	10876	11791	6558	3923
8	4558	8958	5865	6628	3619	2026	4023	5992	6699	9119	5107
9	3409	5172	4499	10308	3855	3015	3465	5155	4576	10210	10314
10	3031	4973	13936	11550	5731	3494	5255	7899	5364	9146	13826
11	3896	6483	5692	8636	6950	4555	4208	6504	4352	3619	8635
12	3198	6879	4410	7853	6015	5492	3905	5485	3427	1666	2245
13	2594	5919	5777	8235	5256	4995	3541	5233	3736	2819	1898
14	1267	8473	4306	3721	3976	3939	2798	3785	2427	1531	841
15	3667	6176	5629	6653	5649	4311	3986	5979	4160	3176	4077
Total	698700	1284616	1441193	1002369	1380646	1777349	996357	1372447	1147402	1417368	1085258

BFT-Table 4. CPUE series available for east Atlantic and Mediterranean bluefin tuna

Gear	TRAP	BB	LL	LL	PSFB	PSFB	PSM	PSM
Country	SPAIN	SPAIN	JAPAN	JAPAN	ITALY	ITALY	FRANCE	FRANCE
Area	E. ATL GIBRARTAL	E. ATL BAY BISCAY	EAT+MED	EAT+MED	MED Tyrrhenian	MED Tyrrhenian	MED G of Leons	MED G of Lions
Age range	7+	2	8+	8+	3-7	8+	2	3
Num/Weight	N	N	N	N	N	N	N	N
Nom/Stand	N	N	S(SCRS-169)	S(W.G.)	N	N	N	N
Year								
70		36.1						
71	11.0	27.5						
72	3.5	26.7						
73	18.2	51.2						
74		38.8						
75	15.5	56.2	1.00	1.00				
76	13.7	53.6	1.09	1.11				
77	10.1	58.6	2.06	1.96				
78	16.2	33.0	0.85					
79	16.8	10.4	0.64	0.63				
80	33.7	22.6	1.15	1.11	2.31	21.70		
81	33.0	33.8	0.79	0.77	8.22	14.30		
82	71.3	31.5	1.60		5.82	11.25	245.7	143.7
83	41.3	44.2	0.95	0.90	6.36	18.17	124.3	109.4
84	43.4	140.0	0.61	0.57	25.24	13.94	332.9	35.9
85	37.8	67.9	0.77	0.75	7.08	6.91	114.7	172.7
86	11.5	48.5	0.43	0.43	3.10	6.54	85.7	86.0
87	14.2	86.0	0.87	0.86	8.30	5.81	245.3	60.9
88	41.1	59.8	0.67	0.64	4.45	4.33	52.2	142.4
89	25.7	63.2	0.31	0.31			280.5	54.0
90	47.5	33.7	0.43	0.42			201.5	62.2
91	22.4	63.8	0.70	0.69			253.6	53.9
Fishing Season	middle year	middle year	middle year	middle year	middle year	middle year	middle year	middle year

BFT-Table 5. Partial recruitment for different periods, east bluefin stock

AGE	70-73	74-81	82-87	88-91
1	0.3609	0.4819	0.6924	0.8084
2	1.0000	1.0000	1.0000	1.0000
3	1.2972	1.2515	0.7535	0.8632
4	0.4770	0.5335	0.2958	0.4491
5	0.3475	0.1294	0.1390	0.3830
6	0.2128	0.0848	0.1124	0.1802
7	0.2455	0.1010	0.1463	0.2083
8	0.4414	0.1222	0.1527	0.2103
9	0.8720	0.1639	0.1903	0.3303
10	0.4172	0.2886	0.3780	0.7306
11	0.3642	0.3885	0.4629	0.8998
12	0.3283	0.4765	0.6015	0.8013
13	0.5084	0.8396	0.8890	1.3015
14	1.0000	1.0000	1.0000	1.0000

BFT-Table 6. Estimates of east Atlantic bluefin tuna stock size (on 1 January) by age for 1970-1992

Age	70	71	72	73	74	75	76	77	78	79	80
1	470159	635815	506567	668747	1263063	1257888	1027504	849123	530231	634721	1016935
2	286905	286528	542952	332133	448619	924081	450986	803124	536270	320214	481451
3	207745	178674	166897	334132	226605	269310	535128	217889	430045	286396	246779
4	193337	155605	106005	73699	212766	144051	201721	205852	147264	232468	154558
5	281827	152870	121612	81587	58239	126465	106727	138489	119567	110186	155627
6	111431	235841	121359	98015	67845	43819	104314	73805	118225	99134	89264
7	54052	89224	201629	98910	82125	54501	34027	85976	59266	101338	83935
8	54194	42765	73404	171339	79710	68699	44398	26627	71036	48848	85964
9	36376	43811	28179	61677	141594	65210	56616	36708	20858	60082	38801
Age Group											
10+	260071	229489	215393	194266	199129	249716	218514	199292	169201	139201	148651
5-9	537880	564511	546184	511529	429512	358693	346082	361604	388952	419587	453591
2-4	687987	620807	815854	739964	887989	1337442	1187835	1226865	1113579	839078	882788
5-10	797951	794000	761577	705795	628641	608409	564596	560897	558153	558788	602242
8-10	350641	316064	316977	427283	420433	383625	319528	262626	261095	248130	273416

Age	81	82	83	84	85	86	87	88	89	90	91	92
1	841642	1366340	2429648	1087023	922359	1823662	844081	1894892	1376886	1527872	719356	
2	780438	592499	541150	1456502	784335	600550	1006760	493095	891495	768867	838260	340934
3	266106	364460	305755	312913	671541	350053	268990	463375	271100	385724	328372	344591
4	100011	128433	140108	153547	226637	291297	149633	132492	172483	152910	142331	149910
5	105938	74848	89764	98612	99644	167437	183647	101903	87844	90331	80040	88130
6	126805	78278	60097	66394	67555	74251	137855	150556	79781	41438	53242	52252
7	73280	104971	64994	49119	48260	50345	59263	112654	121494	63136	28660	40411
8	70105	60138	86404	47335	36915	38116	41205	43808	87818	94653	48789	21266
9	72615	56702	43954	69655	34985	28725	31252	32077	32512	70107	73801	37667
Age Group												
10+	138012	163517	150515	127980	119013	99139	83496	74555	55662	50677	75202	90777
5-9	448744	374937	345213	331116	287359	358874	453222	440998	409450	359666	284539	239727
2-4	1146555	1085392	987014	1922962	1682513	1241900	1425383	1088963	1335078	1307501	1308963	835434
5-10	586756	538454	495728	459096	406372	458013	536717	515553	465112	410342	359741	330503
8-10	280732	280357	280873	244970	190913	165979	155952	150440	175992	215437	197792	149710

BFT-Table 7. Estimates of east Atlantic bluefin tuna stock fishing mortality rates by age for 1970-1991

Age	70	71	72	73	74	75	76	77	78	79	80
1	0.3552	0.0179	0.2821	0.2592	0.1725	0.8858	0.1064	0.3196	0.3643	0.1364	0.1247
2	0.3336	0.4005	0.3455	0.2423	0.3703	0.4063	0.5875	0.4846	0.4873	0.1205	0.4529
3	0.1490	0.3821	0.6774	0.3113	0.3130	0.1490	0.8153	0.2518	0.4751	0.4768	0.7632
4	0.0948	0.1065	0.1218	0.0954	0.3802	0.1599	0.2361	0.4033	0.1501	0.2613	0.2377
5	0.0381	0.0908	0.0757	0.0445	0.1445	0.0526	0.2288	0.0182	0.0474	0.0706	0.0648
6	0.0822	0.0167	0.0645	0.0369	0.0790	0.1129	0.0533	0.0794	0.0141	0.0264	0.0573
7	0.0942	0.0552	0.0228	0.0758	0.0385	0.0650	0.1052	0.0509	0.0533	0.0245	0.0400
8	0.0727	0.2771	0.0341	0.0507	0.0608	0.0534	0.0502	0.1042	0.0275	0.0903	0.0288
9	0.1790	0.1480	0.1335	0.1598	0.0834	0.0923	0.0745	0.0757	0.0650	0.0675	0.0678
Age Group											
10+	0.1075	0.0889	0.0802	0.0960	0.2379	0.2634	0.2125	0.2159	0.1854	0.1925	0.1935
5-9	0.0652	0.0704	0.0507	0.0644	0.0777	0.0690	0.1127	0.0502	0.0354	0.0506	0.0521
2-4	0.2052	0.3134	0.3710	0.2568	0.3577	0.3209	0.6080	0.4256	0.4311	0.2698	0.4860
5-10	0.0788	0.0757	0.0589	0.0730	0.1257	0.1443	0.1501	0.1060	0.0785	0.0841	0.0852
8-10	0.1092	0.1205	0.0739	0.0864	0.1489	0.1924	0.1630	0.1834	0.1302	0.1404	0.1209

Age	81	82	83	84	85	86	87	88	89	90	91
1	0.2110	0.7862	0.3717	0.1864	0.2891	0.4541	0.3975	0.6140	0.4427	0.4603	0.6067
2	0.6214	0.5216	0.4078	0.6342	0.6668	0.6632	0.6360	0.4582	0.6978	0.7108	0.7490
3	0.5885	0.8160	0.5488	0.1826	0.6952	0.7099	0.5681	0.8482	0.4326	0.8570	0.6441
4	0.1498	0.2182	0.2112	0.2924	0.1627	0.3213	0.2442	0.2710	0.5068	0.5072	0.3393
5	0.1626	0.0795	0.1616	0.2382	0.1542	0.0544	0.0587	0.1047	0.6114	0.3886	0.2866
6	0.0498	0.0460	0.0617	0.1790	0.1540	0.0855	0.0619	0.0745	0.0940	0.2287	0.1357
7	0.0576	0.0547	0.1770	0.1456	0.0960	0.0603	0.1622	0.1091	0.1096	0.1178	0.1584
8	0.0722	0.1735	0.0755	0.1624	0.1108	0.0585	0.1104	0.1582	0.0852	0.1088	0.1187
9	0.0516	0.1027	0.1161	0.1723	0.1255	0.1192	0.1264	0.1886	0.1632	0.1693	0.1619
Age Group											
10+	0.1472	0.2932	0.3312	0.4917	0.3582	0.3403	0.3606	0.6882	0.5958	0.6180	0.5909
5-9	0.0802	0.0832	0.1187	0.1873	0.1350	0.0671	0.0819	0.1064	0.1935	0.2802	0.1822
2-4	0.5629	0.5663	0.4177	0.5160	0.5925	0.5837	0.5743	0.5774	0.6127	0.7246	0.6694
5-10	0.0956	0.1424	0.1786	0.2633	0.1954	0.1202	0.1205	0.1723	0.2339	0.2433	0.2549
8-10	0.1028	0.2258	0.2115	0.3242	0.2609	0.2291	0.2402	0.3942	0.2364	0.2287	0.2917

BFT-Table 8. Yield per recruit (kg), stock size per recruit (#) and biomass per recruit (kg) for two cases of mortality rate

Case a) 1991 mortality rate at age as estimated from the VPA base case assessment

F	Yield/Rec	Stock/Rec	Biomass/Rec	
0.000	0.000	7.1891	654.662	
0.100	20.609	5.3298	354.790	
0.126	22.064	4.9791	306.627	<---- F 0.1
0.174	22.905	4.4305	237.260	<---- Fmax
0.200	22.740	4.1774	207.822	
0.300	20.398	3.4160	129.521	
0.400	17.450	2.8885	84.735	
0.500	14.863	2.5098	57.630	
0.600	12.790	2.2302	40.497	
0.700	11.176	2.0190	29.296	
0.749	10.512	1.9325	25.174	<---- F 91
0.800	9.927	1.8562	21.776	
0.900	8.959	1.7285	16.613	

Case b): 1991 mortality rate at age as estimated from the VPA, but with no fishing mortality on age 1-3

F	Yield/Rec	Stock/Rec	Biomass/Rec	
0.000	0.000	7.1891	654.662	
0.100	27.588	6.2501	424.525	
0.173	33.769	5.8046	332.084	<---- F 0.1
0.200	34.806	5.6712	306.888	
0.294	35.969	5.2956	242.406	<---- Fmax
0.300	35.966	5.2752	239.194	
0.400	35.323	4.9827	195.967	
0.500	34.182	4.7547	166.002	
0.591	33.067	4.5857	145.680	<---- F 91
0.600	32.958	4.5705	143.933	
0.700	33.179	4.4179	126.960	
0.800	30.707	4.2894	113.498	
0.900	29.731	4.1796	102.578	

F expressed as F at fully recruited age

BFT-Table 9. Estimated bluefin tuna catches in numbers by size categories (divided at 6.4 KG = 69 CM)

	79	80	81	82	83	84	85	86	87	88	89	90	91
EAST ATLANTIC													
< 6.4 Kg	72521	97854	115316	178362	391005	48549	44882	371518	61992	352205	207264	71615	60869
= or > 6.4 Kg	76450	73922	67543	86622	128459	241441	171158	126877	156240	129310	281162	113283	126106
Total	148971	171776	182859	264984	519466	289991	216041	498396	218232	481515	488426	184899	186975
% fish <6.4 Kg	48.68	56.97	63.06	67.31	75.27	16.74	20.78	74.54	28.41	73.15	50.75	38.73	32.55
MEDITERRANEAN SEA													
< 6.4 Kg	52003	62470	62423	288783	535590	88314	541376	780105	269230	464484	184812	602086	302365
= or > 6.4 Kg	155544	296234	453414	730847	386136	624063	623228	498848	508893	426444	554163	630379	595915
Total	207548	358705	515838	1019630	921726	712377	1164605	1278953	778123	890928	738975	1232466	898281
% fish <6.4 Kg	25.06	17.42	12.1	28.32	58.11	12.4	46.49	61	34.6	52.13	25.01	48.85	33.66
EAST ATLANTIC + MEDITERRANEAN SEA													
< 6.4 Kg	124525	160324	177739	467145	926596	136864	586259	1151624	331222	816690	392076	673702	363235
= or > 6.4 Kg	231994	370157	520958	817469	514596	865505	794386	625725	665133	555754	755325	743662	722022
Total	356520	530481	698698	1284615	1441193	1002369	1380645	1777350	996355	1372444	1147402	1417365	1085257
% fish <6.4 Kg	34.93	30.22	25.44	36.36	64.29	13.65	42.46	64.79	33.24	59.51	34.17	47.53	33.47

BIL-Table 1. Atlantic blue marlin catches (in MT), by north and south Atlantic and by major gears

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
NORTH ATLANTIC	3452	5141	4809	3682	2040	1173	1344	1601	1845	2115	1315	1616	1916	2076	1366	1255	976	880	1064	1248	1603	1146	1196	1302	1041	660	892	1471	1125	953
-LONGLINE	3331	5010	4645	3517	1884	970	1170	1388	1635	1932	1122	1406	1497	1683	978	876	553	480	639	780	1154	763	806	1062	726	384	622	1245	986	798
CANADA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	++	0
CHITAIW	9	27	8	2	34	131	337	348	369	158	300	155	183	105	169	64	81	51	160	98	100	106	74	86	117	52	20	8	319	327
CUBA	0	123	128	144	91	223	167	122	108	149	67	223	516	594	250	220	97	156	162	178	318	273	214	246	103	68	94	74	112	0
JAPAN	3223	4759	4434	3330	1677	485	474	658	758	1223	335	229	267	551	260	118	54	68	193	332	637	192	351	409	174	78	206	593	250	133
KOREA	0	0	1	4	46	66	93	214	368	221	215	457	385	304	174	307	185	67	45	70	18	25	57	83	49	15	8	99	78	108
PANAMA	0	0	0	0	0	0	0	0	**	**	10	208	62	44	47	87	42	6	0	0	0	0	0	0	0	0	0	0	0	0
ESPANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	4	1	0	0	23	2	4
USA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	61	92	280	428	205	187
USSR	0	0	0	1	1	3	3	3	2	3	7	10	1	3	0	1	1	**	0	0	0	0	0	0	7	23	0	0	0	0
VENEZUEL	99	101	74	36	35	62	96	43	30	178	188	124	83	82	78	79	93	132	79	102	81	167	107	214	214	55	14	20	20	39
-ROD & REEL	121	131	164	165	156	203	174	213	210	183	193	210	236	242	266	296	296	297	297	299	297	192	197	159	202	173	178	126	30	35
PORTUGAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	11	7	2	0	0	0
USA	115	128	161	163	149	197	168	207	204	179	191	209	234	241	265	295	295	295	295	295	295	187	187	147	187	161	173	121	25	30
VENEZUEL	6	3	3	2	7	6	6	6	6	4	2	1	2	1	1	1	1	2	2	4	2	5	10	5	4	5	3	5	5	5
-OTHER & UNCL	0	0	0	0	0	0	0	0	0	0	0	0	183	151	122	83	127	103	128	169	152	191	193	81	113	103	92	100	109	120
BARBADOS	0	0	0	0	0	0	0	0	**	**	**	**	183	150	120	81	72	51	73	117	99	126	126	10	14	13	11	11	11	11
BERMUDA	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	5	2	4	1	2	7	8	9	11	6	8	15	17	18
GRENADA	0	0	0	0	0	0	0	0	**	**	**	**	**	**	**	**	**	**	1	1		6	8	11	36	33	21	23	30	37
NLDANT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	50	50	50	50	50	50	50	50	50	50	50	50	50
PORTUGAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	1	1	1	++	1	1	4
ESPANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
USA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	++	1	++	++	0	0	0
SOUTH ATLANTIC	3856	3896	3201	2473	1819	1067	1090	1490	1019	1079	1051	1561	1100	1109	944	792	530	504	554	459	854	507	923	1289	796	1109	1507	2206	2038	1730
-LONGLINE	3856	3896	3201	2473	1819	1067	1090	1489	1018	1079	1051	1561	1100	1109	933	739	526	490	545	431	824	504	812	1171	684	993	1346	1625	1556	1447
BRASIL	24	12	12	12	12	6	15	17	38	14	17	4	15	15	30	47	45	20	21	26	28	27	30	32	41	39	63	58	47	47
CHITAIW	11	21	5	2	35	160	385	1016	560	604	628	537	369	422	240	107	177	139	129	104	150	39	50	95	98	265	204	335	320	452
CUBA	0	22	26	32	27	221	113	43	41	17	22	75	170	195	159	100	113	180	187	108	118	123	159	205	111	137	191	77	90	0
JAPAN	3821	3841	3156	2421	1693	588	472	302	247	172	85	117	17	57	4	17	15	66	115	136	495	248	482	691	335	362	617	962	967	736
KOREA	0	0	1	3	47	79	93	98	120	258	251	532	449	354	392	356	140	78	92	56	33	67	91	141	83	168	239	188	132	184
PANAMA	0	0	0	0	0	0	0	0	**	**	12	244	72	51	107	103	32	7	0	0	0	0	0	0	0	0	0	0	0	0
SAFRICA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
USSR	0	0	1	3	5	13	12	13	12	14	36	52	8	15	1	9	4	**	0	1	0	0	0	7	16	22	32	5	0	0
BRASTAI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28
BRAS-HON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	++

BIL-Table 1. Continued

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
-OTHER & UNCL	0	0	0	0	0	0	0	1	1	0	0	0	0	0	11	53	4	14	9	28	30	3	111	118	112	116	161	581	482	283
BENIN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	8	0	9	10	7	4	12	0	6	6
BRASIL	0	0	0	0	0	0	0	1	1	0	0	0	0	0	11	53	4	14	9	22	22	3	2	8	5	12	11	1	2	1
CIVOIRE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	100	100	100	138	150	150	150
GHANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	430	324	126
UNCL REGION	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	213	281	145	100	100	100	100	100	100	100	100
-PURSE SEINE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	213	281	145	100	100	100	100	100	100	100	100
FIS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	150	180	100	100	100	100	100	100	100	100	100
ESPANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	63	101	45	0	0	0	0	0	0	0	0

++ CATCH: < 0.5 MT
** CATCH: UNKNOWN

BIL-Table 2. Atlantic white marlin catches (in MT), by north and south Atlantic and by major gears

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
TOTAL	2064	2614	3735	4906	3512	1426	2047	2254	2097	2260	2280	1792	1750	1577	1819	1125	949	1015	955	1121	1091	1694	1089	1531	1630	1466	1165	1613	1064	1382
NORTH ATLANTIC	381	914	1694	2127	1798	588	692	1212	1048	1547	1208	995	1218	1088	1052	501	428	481	508	780	653	1382	702	842	928	583	302	267	243	249
-LONGLINE	302	848	1620	2048	1711	497	594	1114	932	1440	1099	886	1103	977	938	390	317	370	396	669	543	1236	549	693	893	484	202	245	220	238
CANADA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
CHITAIW	1	4	3	2	32	47	58	132	97	178	244	120	248	84	142	44	79	62	105	174	130	203	52	100	319	153	++	4	15	13
CUBA	0	35	45	69	118	127	103	58	61	45	34	112	256	294	68	67	43	68	70	189	205	728	241	296	225	30	13	21	14	0
JAPAN	271	754	1493	1913	1417	174	273	451	419	915	339	328	381	404	540	80	27	42	99	118	84	27	52	45	56	60	68	73	34	43
KOREA	0	0	1	1	51	44	52	204	340	219	213	106	90	71	64	71	33	16	12	48	12	28	8	79	42	3	1	24	75	104
PANAMA	0	0	0	0	0	0	0	0	**	**	10	48	14	10	17	20	8	1	0	0	0	0	0	0	0	0	0	0	0	0
ESPANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	14	0	0	0	13	4	2
USA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	39	11	103	89	82	72	40	38
USSR	0	0	0	0	0	1	1	1	0	1	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VENEZUEL	30	55	78	63	93	104	107	268	15	82	258	170	114	113	107	108	127	181	110	140	112	230	148	148	148	148	38	38	38	38
-ROD & REEL	79	66	74	79	87	91	98	98	116	107	109	109	115	111	114	111	111	111	112	111	110	145	150	148	34	97	75	21	22	10
USA	74	64	70	76	76	81	87	76	104	95	99	104	108	107	109	109	109	109	109	109	109	141	143	141	31	91	72	16	17	5
VENEZUEL	5	2	4	3	11	10	11	22	12	12	10	5	7	4	5	2	2	2	3	2	1	4	7	7	3	6	3	5	5	5
-OTHER & UNCL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	1	1	2	25	1	1	1
BERMUDA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	++	++	++	1	1	++	1	1	1	1	1	1
CANADA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	++	0	0
ESPANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	0	0
USA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	**	1	++	0	0	0
SOUTH ATLANTIC	1683	1700	2041	2779	1714	838	1355	1042	1049	713	1072	797	532	489	767	624	521	534	447	341	438	312	387	689	702	883	863	1346	821	1133
-LONGLINE	1683	1700	2041	2779	1714	838	1355	1042	1049	713	1072	797	532	489	742	621	519	530	444	341	438	312	387	684	676	874	774	1277	786	961
ARGENTIN	0	0	0	0	0	3	14	0	**	20	100	57	++	2	2	2	**	0	0	0	0	0	0	0	0	0	0	0	0	0
BRASIL	34	17	17	17	17	9	21	24	54	17	33	18	32	32	43	272	173	129	55	25	76	70	61	88	143	90	147	182	203	96
CHITAIW	5	10	3	2	29	134	327	436	469	260	469	412	279	255	377	119	197	155	145	136	220	87	66	134	196	613	514	979	372	556
CUBA	0	9	17	33	23	67	15	7	8	4	6	21	48	55	38	57	127	205	212	116	45	112	153	216	192	62	24	22	6	0
JAPAN	1644	1664	2002	2718	1585	494	815	392	284	65	101	27	9	14	3	26	14	15	7	25	27	17	24	81	73	74	76	73	92	84
KOREA	0	0	2	7	58	125	157	177	230	341	332	165	139	109	220	111	5	24	25	37	60	13	18	121	56	29	12	20	112	156
PANAMA	0	0	0	0	0	0	0	0	**	**	16	75	22	16	59	31	1	2	0	0	0	0	0	0	0	0	0	0	0	0
URUGUAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	10	13	65	44	16	6	1	1	1	1
USSR	0	0	0	2	2	6	6	6	4	6	15	22	3	6	0	3	2	0	0	1	0	0	0	0	0	0	0	0	0	0
BRASTAI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67
BRAS-HON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
-OTHER & UNCL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	3	2	4	3	0	0	0	0	5	26	9	89	69	35	172
ARGENTIN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0
BRASIL	0	0	0	0	0	0	0	++	++	0	0	0	0	0	25	3	2	4	3	++	++	++	++	1	++	3	1	1	4	++
GHANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	6	88	68	31	172

++ CATCH: < 0.5 MT

** CATCH: UNKNOWN

BIL-Table 3. Atlantic sailfish catches (in MT), by east and west Atlantic and by major gears

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
TOTAL	**903**	**998**	**1483**	**2919**	**2420**	**1900**	**2596**	**2112**	**2778**	**2805**	**2420**	**1638**	**1347**	**1182**	**1553**	**1950**	**2661**	**3339**	**2510**	**1959**	**1878**	**3603**	**3054**	**2862**	**2547**	**2954**	**2309**	**1663**	**2025**	**1555**
EAST ATLANTIC	457	495	515	1334	1242	571	1145	739	580	860	1035	717	311	227	363	894	1775	2391	1549	965	776	2805	2096	1902	1563	2023	1459	1079	1386	916
-LONGLINE *	457	495	515	1334	1242	495	1069	658	493	748	913	571	196	83	149	96	58	38	33	87	209	247	191	135	138	93	90	169	147	42
CAP VERT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
CHITAIW	0	0	0	0	0	77	508	414	387	609	785	491	168	38	144	59	42	19	0	0	0	0	9	9	0	0	0	0	9	11
CUBA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	158	200	115	19	55	50	22	53	61	0
JAPAN	457	495	515	1331	1237	404	548	230	95	125	89	66	19	38	4	24	11	19	33	50	38	47	63	84	71	37	57	57	63	12
KOREA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	1	1	7	8	14	19
ESPANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	4	7	9	0	0	47	++	++
USSR	0	0	0	3	5	14	13	14	11	14	39	14	9	7	1	13	5	**	0	37	0	0	0	0	2	5	4	4	0	0
-ROD & REEL	0	0	0	0	0	2	5	7	13	38	48	70	33	61	76	93	79	77	62	88	69	49	41	25	45	73	46	37	51	47
SENEGAL	0	0	0	0	0	2	5	7	13	38	48	70	33	61	76	93	79	77	62	88	69	49	41	25	45	73	46	37	51	47
-TROLLING	0	0	0	0	0	74	71	74	74	74	74	74	74	61	113	67	64	30	263	305	402	346	93	154	390	393	332	335	752	334
SENEGAL	0	0	0	0	0	74	71	74	74	74	74	74	74	61	113	67	64	30	263	305	402	346	93	154	390	393	332	335	752	334
-OTHER & UNCL	0	0	0	0	0	0	0	0	0	0	0	2	8	22	25	638	1574	2246	1191	485	96	2163	1771	1588	990	1464	991	538	436	493
BENIN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	48	0	53	50	25	32	40	8	20	20
CIVOIRE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	40	40	40	76	60	5	5
GHANA	0	0	0	0	0	0	0	0	0	0	0	2	8	22	11	638	1574	2246	1191	449	16	2161	1658	1497	925	1392	870	465	406	463
KOREA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SENEGAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	2	20	1	0	0	5	5	5	5
WEST ATLANTIC	444	476	914	1470	920	727	862	759	1319	1127	575	581	646	568	813	758	727	731	691	630	914	683	958	960	984	931	850	579	639	639
-LONGLINE *	297	317	737	1279	715	516	644	523	1059	860	304	308	353	272	437	221	211	206	154	152	430	225	436	459	457	505	604	367	395	345
BRASIL	91	46	46	46	46	23	57	27	21	43	64	37	78	76	124	139	128	77	77	38	58	60	80	139	232	133	100	106	100	13
CHITAIW	0	0	0	0	0	106	86	179	111	170	17	107	80	28	126	5	10	18	0	0	0	0	42	39	49	19	300	126	66	126
CUBA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	181	28	169	130	50	171	78	55	126	0
JAPAN	143	240	655	1140	608	274	422	228	499	321	132	78	118	112	133	23	9	20	22	44	135	22	34	38	28	6	22	22	25	89
KOREA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	39	21	24	5	7	38	53
USA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	78	80	32	21	37
VENEZUEL	63	31	36	93	61	113	79	89	428	326	91	86	77	56	54	54	64	91	55	70	56	115	74	74	74	74	19	19	19	19
BRASTAI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
-ROD & REEL	147	159	177	191	205	211	218	236	232	239	243	245	255	258	266	339	338	350	368	336	331	312	352	228	233	237	38	30	25	33
BRASIL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	28	40	57	26	22	0	37	26	35	36	27	23	19	25
USA	142	157	173	188	194	201	207	214	220	227	233	240	248	254	261	308	308	308	308	308	308	308	308	195	195	195	8	2	1	3
VENEZUEL	5	2	4	3	11	10	11	22	12	12	10	5	7	4	5	2	2	2	3	2	1	4	7	7	3	6	3	5	5	5

BIL-Table 3. Continued

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
-OTHER & UNCL	0	0	0	0	0	0	0	0	28	28	28	28	38	38	110	198	178	175	169	142	153	146	170	273	294	189	208	182	219	261
ARUBA	0	0	0	0	0	0	0	0	++	++	++	++	10	10	20	20	30	30	30	30	30	30	30	30	30	30	30	30	30	30
BRASIL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62	119	90	84	87	55	53	8	4	23	25	5	10	0	15	0
DOMINR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	50	49	46	18	40	44	44	40	40
GRENADA	0	0	0	0	0	0	**	**	**	**	**	**	**	**	**	31	37	40	31	36	27	37	66	164	211	104	114	98	124	181
NLDANT	0	0	0	0	0	0	0	0	28	28	28	28	28	28	28	28	21	21	21	21	21	21	21	10	10	10	10	10	10	10
USA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	++	0	0	0
UNCL REGION	2	27	54	115	258	602	589	614	879	818	810	340	390	387	377	298	159	217	270	364	188	115	0	0	0	0	0	5	0	0
-LONGLINE *	2	27	54	115	258	602	589	614	879	818	810	340	390	387	377	298	159	217	270	364	188	115	0	0	0	0	0	5	0	0
CHITAIW	2	4	2	2	34	0	0	0	0	0	0	0	0	0	0	0	0	0	49	86	140	108	0	0	0	0	0	0	0	0
CUBA	0	23	49	102	75	371	314	71	100	51	30	100	229	262	185	156	120	191	198	213	0	0	0	0	0	0	0	0	0	0
KOREA	0	0	3	11	149	231	275	543	779	767	745	165	139	109	151	111	32	24	23	65	48	7	0	0	0	0	0	5	0	0
PANAMA	0	0	0	0	0	0	0	0	**	**	35	75	22	16	41	31	7	2	0	0	0	0	0	0	0	0	0	0	0	0

++ CATCH: < 0.5 MT
** CATCH: UNKNOWN
* INCLUDES SPEARFISH (T. PFLUEGERI & T. BELONE)

BIL-Table 4. Atlantic billfish (unknown species) catches (in MT), by region and by major gears

REGIO	COUNTRY	GEAR	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
TOTAL			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	116	0	0	129	152	68	99	104	108	19	20
ETRO	GABON	UNCL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**	116	++	++	++	++	++	++	++	++	++	++
GOFM	USA	LL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0
GOFM	USA	R R	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	++	0	0	0	0	0	0
NE	LIBERIA	UNCL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	129	78	68	94	74	103	18	20
NE	PORTUGAL	PS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0
NE	PORTUGAL	SURF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1	1	1	++
NORT	CUBA	LL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NW	GRENADA	UNCL	0	++	++	++	++	++	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NW	ST.LUCIA	HAND	0	0	0	0	0	0	0	0	**	**	**	**	**	**	**	**	**	**	0	0	0	0	0	0	0	0	0	0	0	0
NW	USA	GILL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	++	0	0	0	0	0	0
NW	USA	HAND	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
NW	USA	LL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	0	0	0	0	0	0
NW	VEN-FOR	LL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	29	0	0	0
SOUT	CUBA	LL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SW	BRASIL	SURF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	0	0	0	0	0	0
WTRO	GUADELOU	SURF	0	0	0	0	0	0	0	0	0	0	0	++	++	++	++	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WTRO	MARTINIQ	SURF	0	0	0	0	0	0	0	0	0	0	0	++	++	++	++	++	++	++	++	++	++	++	++	++	0	0	0	0	0	0

++ CATCH: < 0.5 MT
** CATCH: UNKNOWN

BIL-Table 5. **Maximum sustainable yield (MSY) and proportion of biomass in 1990 relative to biomass at MSY (B_{90}/B_{MSY}) for final weighted models and sensitivity runs for blue marlin. Weights remain constant.**

	MSY	B_{90}/B_{MSY}
North Atlantic		
weighted model	1,718	0.804
+ 25% catch	2,181	0.835
+ 25% catch (76-89)	2,735	0.569
+ 50% catch	2,887	0.747
Total Atlantic		
weighted model	3,517	0.323
+ 25% catch	4,466	0.425
+ 25% catch (76-89)	4,077	0.448
+ 50% catch	7,094	0.617

BIL-Table 6. **Maximum sustainable yield (MSY) and proportion of biomass in 1991 relative to biomass at MSY (B_{91}/B_{MSY}) for final weighted models and sensitivity runs for white marlin. Weights remain constant.**

	MSY	B_{91}/B_{MSY}
North Atlantic		
weighted model	593	0.565
+ 25% catch	740	0.565
+ 25% catch (76-90)	627	0.655
+ 50% catch	888	0.565
Total Atlantic		
weighted model	1,644	0.253
+ 25% catch	2,100	0.248
+ 25% catch (76-90)	1,782	0.297
+ 50% catch	2,633	0.233

SWO-Table 1. Atlantic and Mediterranean swordfish catches (in MT), by gear, area and country, 1962-1991

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
TOTAL	6411	11924	13681	12990	13020	11940	14912	1715	17896	12159	13079	13631	13902	15923	13864	14330	20377	20403	25267	21792	25501	26661	35302	39010	40849	43466	51187	51188	45410	37637
N.ATL.	5342	10189	11258	8652	9338	9084	9137	9138	9425	5198	4727	6001	6301	8776	6587	6352	11797	11859	13527	11126	12832	14423	12516	14255	18278	19959	19137	17008	15594	13212
-LL	3202	9192	10833	7759	8492	8656	8950	8938	9127	5140	4430	5446	5078	7015	5125	5401	11085	11099	12800	10507	12600	13897	12350	14120	18080	19753	18792	15297	14059	12612
CANADA	311	6682	6888	4155	3731	4534	4342	4149	4800	0	0	0	2	21	15	113	2314	2970	1794	542	542	960	465	550	973	876	686	1097	819	953
CHITAIW	0	2	1	1	37	76	115	218	234	226	129	243	204	209	362	189	126	260	103	140	200	209	126	117	121	40	18	13	207	239
CUBA	400	125	134	171	175	336	224	97	134	160	75	248	572	280	283	398	281	128	278	227	254	410	206	162	636	910	832	87	47	0
JAPAN	106	311	700	1025	658	280	262	130	298	914	784	518	1178	2462	1149	793	946	542	1167	1315	1755	537	665	921	807	413	621	1572	1051	943
KOREA	0	0	1	2	27	46	24	22	40	159	155	374	152	172	335	541	634	303	284	136	198	53	32	160	68	60	30	320	51	3
MAROC	12	6	18	14	12	11	13	16	14	21	15	10	12	15	12	6	11	208	136	124	91	125	79	137	178	207	195	219	18	9
NORWAY	0	0	0	++	300	300	200	600	400	200	**	**	**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PANAMA	0	0	0	0	0	0	0	0	**	**	7	171	24	25	91	22	76	26	0	0	0	0	0	0	0	0	0	0	0	0
PORTUGA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	15	448	959	600	289	466	728
ESPANA	2300	1000	1800	1433	2999	2690	3551	3502	3160	3384	3210	3833	2893	3747	2816	3309	3611	2582	3810	4013	4554	7100	6315	7431	9712	11134	9600	5696	5736	5522
USA	65	1053	1279	945	534	340	180	93	0	0	0	0	0	0	0	0	3020	3888	5015	3986	4912	4468	4416	4563	5035	5068	6026	5835	4977	4129
USSR	0	0	0	5	8	22	21	11	24	24	28	26	17	32	19	15	20	10	21	0	69	0	16	13	18	0	0	0	0	0
VENEZUE	8	13	12	8	11	21	18	100	23	52	27	23	24	52	43	15	46	182	192	24	25	35	23	51	84	86	108	57	158	86
NEI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76	112	529	0
-UNCL	2140	997	425	893	846	428	187	200	298	58	297	555	1223	1761	1462	951	712	760	727	619	232	526	166	135	198	206	345	1711	1535	600
CANADA	1781	800	211	519	702	260	51	108	0	0	0	0	0	0	0	0	0	0	91	19	12	128	34	35	86	78	18	150	92	73
CAP VERT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0
CHITAIW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
FRANCE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	4	0	0	1	4	4	0	0	0	75	75
IRELAND	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ITALY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0
LIBERIA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	38	34	53	++	24	16	30	19	35	3	0
MARTINIQ	**	**	**	**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MEXICO	+	++	++	++	++	++	++	+	0	0	2	4	3	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
MAROC	0	0	100	86	49	23	30	4	3	12	28	8	3	0	0	1	0	0	0	0	0	4	2	0	0	0	1	4	185	183
POLAND	0	0	0	0	0	0	0	0	0	+	0	100	0	0	0	0	6	0	1	0	0	0	0	0	0	0	0	0	0	0
PORTUGA	0	0	9	6	15	11	12	11	8	11	21	37	92	58	32	38	17	29	15	13	11	9	7	7	20	10	5	8	12	16
ROUMANI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
ESPANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	1	0	0	0	10	7	1	199	952	650	127
STLUCIA	0	0	0	0	0	0	0	0	+	+	+	+	+	+	++	+	++	++	0	0	0	0	0	0	0	0	0	0	0	0
USA	359	197	105	282	80	134	94	77	287	35	246	406	1125	1700	1429	912	664	731	610	544	175	332	122	55	65	83	103	550	517	126
USSR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	4	0	0	0	0

SWO-Table 1. Continued

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
S. ATL.	769	1417	2029	2578	1930	1539	2335	4290	5130	1986	2394	2823	2568	2846	2640	2699	2622	2996	5161	3853	6327	5342	9121	9528	5853	5218	11711	16418	16314	11484
-LL	769	1417	2029	2578	1930	1539	2235	4090	5130	1984	2394	2823	2568	2846	2640	2684	2605	2967	5017	3816	6224	5247	8879	8805	4910	4634	11161	15886	15804	10971
ARGENTIN	196	400	508	400	200	79	259	500	400	63	100	48	10	10	111	132	4	0	++	0	0	0	0	0	0	0	0	0	0	0
BRASIL	251	125	125	125	125	62	100	181	162	154	121	161	465	514	365	384	367	520	1579	654	1018	781	467	569	761	956	1125	797	1456	667
CHITAIW	1	4	2	1	73	128	375	637	985	599	621	849	617	719	573	519	481	994	540	406	400	201	153	215	166	260	614	469	689	799
CUBA	0	63	101	164	122	559	410	170	148	74	66	221	509	248	317	302	319	272	316	147	432	818	1161	1301	95	173	159	830	448	0
JAPAN	321	825	1288	1845	1300	474	859	2143	2877	662	1023	480	191	805	105	514	503	782	2029	2170	3287	1908	4395	4613	2913	1877	3426	4019	6254	3464
KOREA	0	0	1	4	54	79	77	370	382	256	249	602	563	279	812	699	699	303	399	311	486	409	625	917	369	666	1012	776	50	147
PANAMA	0	0	0	0	0	0	0	0	**	**	12	274	90	40	219	28	83	26	0	0	0	0	0	0	0	0	0	0	0	0
SAFRICA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	3	3	5	0	0	0
ESPANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66	0	4393	7725	6166	5738
URUGUAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	92	575	1084	1927	1125	537	699	427	414	302	156
USSR	0	0	4	39	56	158	155	89	176	176	202	188	123	231	138	106	149	70	154	36	26	46	146	60	0	0	0	0	0	0
NEI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	856	439	0
-UNCL	0	0	0	0	0	0	100	200	0	2	0	0	0	0	0	15	17	29	144	37	103	95	242	723	943	584	550	532	510	513
ANGOLA	+	++	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	228	815	84	84	84	++	++
ARGENTIN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	++	0	0	0	0	0	20	0	0	361	31	351	198	175	230	230
BENIN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	24	0	86	90	39	13	19	26	28	28
BRASIL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	5	1	3	1	1	0	1	++	1	0	0	0	0	0
BULGARI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CHITAIW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
CIVOIRE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	10	10	10	10	10	10	10
GHANA	**	**	**	**	**	**	100	200	0	0	0	0	0	0	0	0	0	0	110	5	55	5	15	25	13	123	235	235	235	235
JAPAN	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NIGERIA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**	**	83	69	0	0	0	0	0	0	0
SAFRICA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28	31	9	3	7	23	3	2	2	4	++	0	5
TOGO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	32	1	++	2	3	5
USSR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	4	0	0	12	0	0	0	0	0	0	0

SWO-Table 1. Continued

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
MED.	300	318	394	1760	1752	1317	3440	3723	3341	4975	5958	4807	5033	4301	4637	5279	5958	5548	6579	6813	6342	6896	13665	15227	16718	18289	20339	17762	13502	12941
-LL	188	94	282	1423	1192	869	1196	1350	1114	1426	1529	1288	893	212	3770	4236	4726	4357	5193	5323	4880	5362	5755	5370	6450	5961	6542	6194	8683	7876
ALGERIE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	173	173
CYPRUS	0	0	0	0	0	0	0	0	0	0	+	+	+	5	59	95	82	98	72	78	103	28	63	71	154	84	121	139	173	162
GREECE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	91	773	772	1081	1036	1714	1303	1008	1120	1344	1904
ITALY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3435	3330	3750	3455	3642	3362	2583	2660	2759	2493	2622	2831	2989	2989	4592	3629
JAPAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	3	1	0	5	6	19	14	7	3	4	1	2	1
MALTA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	119
MAROC	188	94	282	223	192	169	196	250	214	326	229	183	193	118	186	144	172	0	++	++	0	43	39	38	92	40	62	97	43	24
ESPANA	0	0	0	1200	1000	700	1000	1100	900	1100	1300	1105	700	89	89	667	720	800	750	1120	900	1321	1243	1219	1337	1134	1760	1250	1438	1132
NEI-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	728	672	517	532	552	499	524	566	598	598	918	733
-UNCL	112	224	112	337	560	448	2244	2373	2227	3549	4429	3519	4140	4089	867	1044	1232	1191	1385	1490	1462	1535	7910	9857	10268	12328	13797	11568	4819	5064
ALGERIE	0	0	0	0	0	0	0	0	0	0	0	100	196	500	368	370	320	521	650	760	870	877	884	890	847	1820	2621	590	539	389
FRANCE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	++
ITALY	0	0	0	0	0	0	1568	2240	2016	3248	4144	3136	3730	3362	312	417	756	475	501	461	356	366	6601	8370	8791	9494	10021	10021	2966	3204
LIBYA	0	0	0	224	224	336	560	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MALTA	**	**	**	+	+	+	+	+	112	224	224	224	192	214	175	223	136	151	222	192	177	59	94	108	97	131	207	121	122	0
MAROC	0	0	0	1	0	1	1	0	0	1	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	246	454
ESPANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	8	0	0	2	87	85	39
TUNISIE	0	0	0	0	0	0	0	0	+	+	+	+	5	3	5	0	0	0	0	7	19	15	15	61	64	63	80	159	176	176
TURKEY	112	224	112	112	336	111	115	133	99	76	60	59	15	10	7	34	20	44	13	70	40	216	95	190	226	557	589	209	243	243
NEI-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	219	231	243	262	277	381	442	559

++ CATCH: < 0.5 MT

** CATCH: UNKNOWN

DATA FOR 1960-61 ARE AVAILABLE IN PREVIOUS BIENNIAL REPORTS (1990, 1991).

SWO-Table 2. North Atlantic swordfish stock structure hypotheses and affirmative/negative comments regarding support of the various hypotheses by available data (adapted from the 1991 SCRS Report)

Stock Structure	*CPUE by Age*	*Larval Distribution*	*Catch Distribution (JLL Data)*	*Mark/Recapture (Interchange)*	*Size Distribution*	*Recruitment Trends*	*Genetic Studies*
North Atlantic single stock	Yes	Yes	Yes	Yes (1)	Yes	(6)	
Separate stocks:							
a) Areas, 1, 2, 3, 4A vs 4B (Boundary at 30oW)	No	No	No	(1)	No (2)	No (3)	(6)
b) Areas 1, 2, 3, 4A vs 4B (Boundary at 60oW)	---	No	No	Yes	No (2)	Yes (4)	(6)
North + South single stock	Yes	Yes	---	No (5)	---	---	(6)

(1) There have been no transtlantic recoveries reported which indicate direct E-W or W-E movement. However, movement has been demonstrated from tropical eastern areas to the temperate central area and from central areas to the tropical west. Moreover, a common spawning stock in the tropical zone could be feeding E-W production units with slight communication between both sides at the high latitudes. The differences in probability of obtaining recoveries in different east/west areas are not explained.

(2) If recruitment and exploration are the same for both stocks, similar age composition would mask existence of separate stocks. However, exploitation patterns appear to be somewhat different in the east and west.

(3) In VPAs, run separately for eastern and western stocks, recruitment trends were generally parallel.

(4) Substantial inconsistency occurs between eastern and western stock recruitment trends for the West 1, 2, 3 hypothesis.

(5) No recovery from the north Atlantic has been reported in the south. Moreover, a common spawning population in the tropical area could be feeding the north and south Atlantic. The different probabilities for obtaining recoveries in different areas of the Atlantic have not been taken into account.

(6) Preliminary information indicates the presence of mixed populations in the areas sampled.

SWO-Table 3. North Atlantic swordfish catch at age, by major fishing countries

JAPAN

AGE	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1980	1991
0	47	68	166	31	64	7	97	106	20	54	133	77	8	30
1	183	702	817	540	311	75	632	408	173	474	538	931	169	47
2	693	1336	2113	3063	1865	660	1467	2466	1058	888	1659	4055	1603	469
3	1786	1552	3450	4299	4272	2252	2419	3254	2397	1528	2732	7410	3639	1696
4	2740	1502	2423	4859	4445	2294	2410	3566	2609	1805	2852	6222	4958	4121
5+	6041	2930	6685	6467	10230	2873	3870	4989	4533	3190	4318	7358	6488	6671
Total	11490	8090	15654	19259	21187	8161	10894	14790	10790	7940	12232	26052	16866	13033

SPAIN

AGE	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
0	378	333	928	1625	585	1851	2201	1996	7979	13319	10591	3815	7571	816
1	2721	2959	6072	6610	4270	11261	9819	12965	20974	33292	49111	28694	17967	13036
2	7083	6061	10567	11869	7955	26093	18300	27348	44695	61954	61862	42301	51737	32861
3	9458	7289	12446	14000	12155	28813	26839	32961	45587	61334	52234	34224	39494	40043
4	10387	7834	11998	14217	16263	26659	24909	28688	36388	43925	33385	24953	21196	22146
5+	20420	13530	18657	18629	24757	30944	27161	28862	38332	41804	27132	19841	16600	16111
Total	50446	38006	60668	66951	65985	125621	109229	132820	193955	255630	234315	153830	154565	125014

U.S.A.

AGE	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
0	83	576	1994	1222	2906	2129	2713	2685	3777	3045	8314	3025	5320	580
1	2248	5000	15410	7044	15044	16610	17202	18282	21320	32415	30814	39588	22933	9347
2	7069	13943	25968	17582	18641	23077	28969	24788	36562	40416	56694	54648	46579	28740
3	13470	14019	22968	18262	21553	17007	21365	23943	27147	29476	35870	37076	32574	28935
4	11061	11258	15508	11231	14533	12106	12599	14611	18030	14823	18156	18851	16396	14065
5+	19296	25365	27121	22939	23677	23716	18639	18897	18510	17058	18843	21053	19045	15318
Total	53226	70161	108969	78280	96354	94644	101487	103207	125345	137232	168692	174241	142847	96986

CANADA

AGE	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
0	15	62	65	4	102	112	95	121	275	337	81	106	6	15
1	918	223	2549	33	399	806	356	466	1379	3419	706	2114	693	1280
2	3213	2771	4846	458	1368	2611	1587	1514	4841	5962	3927	5337	3373	2634
3	9061	7015	7426	1495	2948	3479	2271	3069	5583	6331	3801	4808	2749	4127
4	7744	8265	6847	1872	2275	3661	1772	2346	4129	3040	3807	2920	2029	2857
5+	12837	18221	9547	3306	2452	5945	2420	2547	4240	3224	4099	5695	4674	5076
Total	33788	36556	31280	7167	9544	16614	8501	10062	20446	22313	16421	20980	13525	15988

OTHERS

AGE	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
0	58	139	153	71	40	50	80	87	1351	3306	2705	640	4904	436
1	331	1523	1034	535	333	495	516	514	1975	4342	5327	4017	7607	3436
2	1222	3268	2529	1861	1210	1749	1138	1883	4027	7360	7093	6129	17366	5928
3	2410	3509	3365	2367	2265	3716	1812	2376	4968	8875	7595	5917	12332	7133
4	3485	3153	2398	2598	2465	3735	1781	2470	4765	9560	6061	4670	6106	5417
5+	7703	6110	5704	3533	5174	4775	2695	3306	8832	12720	9319	3910	5391	4854
Total	15209	17702	15183	10966	11487	14520	8022	10636	25918	46163	38099	25282	53707	27203

SWO-Table 4. South Atlantic swordfish catch at age, by major fishing countries

JAPAN

AGE	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
0	0	4	0	8	119	0	0	26	0	0	0	390	53	0
1	10	21	64	92	1033	296	410	630	91	210	1186	1339	287	15
2	18	593	535	294	3933	1117	3703	2996	541	1561	4032	6901	2012	2156
3	37	1689	2422	1289	9320	3761	9051	8784	2015	4830	13258	14468	11389	6428
4	191	1187	4659	2841	8481	4386	11191	16096	6744	5591	13620	15019	32238	16226
5+	3609	4855	14208	15419	21802	14245	27700	29705	24065	18179	24847	24373	38039	25763
Total	3865	8349	21888	19943	44688	23804	52055	58237	33456	30371	56943	62490	84017	50588

SPAIN

Age	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
0	0	0	0	0	0	0	0	0	0	0	2847	1550	1898	1749
1	0	0	0	0	0	0	0	0	118	0	10285	18419	7342	7514
2	0	0	0	0	0	0	0	0	347	0	13510	24666	18951	17502
3	0	0	0	0	0	0	0	0	370	0	18217	36548	36597	35580
4	0	0	0	0	0	0	0	0	265	0	11845	31593	25844	25050
5+	0	0	0	0	0	0	0	0	358	0	19767	27601	28164	23714
Total	0	0	0	0	0	0	0	0	1459	0	76471	140377	118797	111108

BRAZIL+BRAS.JPN+URUGUAY

Age	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
0	34	39	132	83	101	55	1182	453	181	54	62	342	0	0
1	205	381	616	841	1333	1119	5543	3938	2153	1441	1135	1020	2	6
2	695	1284	2317	2330	5703	7758	13681	10782	5254	5890	5995	3973	706	443
3	602	1463	3861	2254	5382	7785	14607	8070	7839	6053	8980	8069	3532	1717
4	677	1370	4243	1918	4695	5167	8227	6189	5263	3285	5793	6041	7870	5053
5+	1385	3071	10561	4511	8814	10326	8774	6290	5176	3368	7037	4381	11898	6699
Total	3599	7608	21730	11937	26027	32210	52013	35722	25866	20089	29002	23827	24009	13918

OTHERS

Age	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
0	1	10	0	3	50	0	0	151	58	53	225	435	67	129
1	41	45	220	55	545	259	256	1920	2436	918	1068	3724	353	557
2	81	1282	902	177	1980	955	2151	6159	6526	3047	3481	9196	1397	1821
3	151	3657	2088	573	4100	2985	4920	8708	7664	3837	14594	15048	4911	4402
4	685	2570	3833	1238	3844	3494	6664	13800	6221	4301	7321	14993	7875	8705
5+	12564	10514	10912	6556	9512	11202	14247	17345	11322	13205	10364	17803	9404	13056
Total	13522	18078	17955	8603	20031	18896	28238	48084	34226	25362	37052	61200	24007	28669

ALL COUNTRIES COMBINED

Age	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
0	34	53	132	94	269	55	1182	630	239	107	3134	2716	2018	1877
1	256	447	899	989	2911	1674	6209	6488	4797	2568	13674	24502	7984	8093
2	794	3159	3754	2801	11616	9830	19535	19937	12668	10498	27017	44736	23066	21921
3	790	6809	8370	4116	18802	14531	28577	25562	17888	14720	55049	74134	56429	48126
4	1553	5127	12735	5996	17020	13047	26082	36085	18494	13177	38580	67646	73828	55034
5+	17558	18440	35681	26486	40128	35772	50721	53340	40921	34752	62015	74159	87505	69232
Total	20986	34035	61573	40482	90747	74910	132305	142043	95007	75822	199469	287893	250830	204284

SWO-Table 5. Abundance indices used in the 1992 north Atlantic swordfish stock assessment (expressed relative to the earliest common year in all series)

AGES	SPAIN 1	SPAIN 2	SPAIN 3	SPAIN 4	SPAIN 5+	U.S. 1	U.S. 2	U.S. 3	U.S. 4	U.S. 5+	JAPAN 5+	Biomass Index
NORTH ATLANTIC STOCK												
1962												3.162
1963												4.557
1964												1.759
1965												1.306
1966												1.136
1967												1.201
1968												0.870
1969												0.808
1970												0.936
1971												-
1972												-
1973												-
1974												1.253
1975											2.233	1.459
1976											1.991	1.189
1977											1.704	1.338
1978											3.612	2.209
1979											1.584	1.129
1980											2.216	1.458
1981						0.726	1.144	1.996	2.062	2.045	1.269	1.220
1982						0.923	0.841	1.573	1.705	1.730	1.757	1.204
1983	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1984	1.016	0.891	1.052	1.041	1.030	0.925	1.172	1.164	1.029	0.763	1.263	0.967
1985	0.995	1.145	1.042	0.998	0.924	1.158	1.031	1.301	1.132	0.775	1.039	0.914
1986	1.561	1.163	0.920	0.764	0.750	1.687	1.539	1.086	0.928	0.489	1.081	0.865
1987	2.051	1.546	1.020	0.740	0.647	1.739	1.474	1.130	0.769	0.401	0.784	0.771
1988	2.276	1.382	0.917	0.657	0.569	1.558	1.684	1.124	0.748	0.364	1.106	0.753
1989	1.986	1.635	0.825	0.596	0.501	2.070	1.527	1.046	0.746	0.397	0.882	0.718
1990	1.240	1.942	1.160	0.646	0.510	1.097	1.441	1.054	0.711	0.385	0.851	0.694
1991	1.095	1.409	1.196	0.759	0.579	3.378	1.487	0.974	0.629	0.342	1.157	0.722

SWO-Table 6. Estimates from ASPIC non-equilibrium production model of north Atlantic swordfish. Estimates (except where noted) have been adjusted by an approximate bias correction from 300 bootstrap trials for the base case, or 100 trials for other runs. Column (4) is an estimate of the ratio of stock biomass at the start of 1992 to the stock biomass level that can provide MSY. (Equilibrium yields from other stock sizes are smaller.) Column (5) contains estimates of the sustainable yields that could be taken from the estimates of stock size in column (4). Yields in columns (4) and (5) are rounded to nearest 100 MT.

(1) Run No.	(2) Years of data omitted, if any	(3) Estimate of MSY (±1 s.e.)	(4) Estimate of B_{92} / B_{MSY} (±1 s.e.)	(5) Estimate of $Y_e(B_{92})$
		Ia. Base case (bias corrected)		
SWO-3	(all data were used)	14,200 (11,600-16,800)	0.84 (0.65-1.03)	13,800
		Ib. Base case (bias uncorrected)		
SWO-3	(all data were used)	12,700 (10,100-15,300)	0.75 (0.56-0.94)	11,900
		II. Runs for sensitivity analysis (bias corrected)		
[1]SWO-4	1962, 1963, 1978	14,300 (11,300-17,300)	0.95 (0.72-1.18)	14,300
[2]SWO-5	1963	14,500 (11,500-17,500)	0.92 (0.72-1.12)	14,400
[3]SWO-6	1962, 1974	15,200 (12,200-18,200)	0.85 (0.63-1.07)	14,900
[4]SWO-7	1978	14,300 (11,500-17,100)	0.92 (0.74-1.10)	14,200
[5]SWO-8	1964	14,700 (11,900-17,500)	0.85 (0.64-1.06)	14,400

1 Concern was expressed about the high levels of index values in these three years, which are the three highest estimated index values. The sensitivity of the model results to exclusion of these three values was tested via this run. Further investigation into the basic data, both the observed CPUE and the catch to which it is applied may allow determination of the accuracy of these data points.

2 Concern was expressed about the 1963 index value level possibly being aberrant in relationship to lower values, 1964 and later. The sensitivity of the model results to exclusion of this value was tested via this run. Further investigation into the basic data, both the observed CPUE and the catch to which it is applied may allow determination of the accuracy of this data point.

3 Concern was expressed that the small sample sizes used to estimate these index values may have resulted in aberrant index values.

4 Concern was expressed about the 1978 index value possibly being aberrant in relationship to lower values, 1979 and later. Further investigation into the basic data, both the observed CPUE and the catch to which it is applied may allow determination of the accuracy of this data point.

5 Concern was expressed that the 1964 data value was low relative to the prior years' observations. Further investigation into the basic data, both the observed CPUE and the catch to which it is applied may allow determination of the accuracy of this data point.

SWO-Table 7. VPA Results for the North Atlantic stock hypothesis

N. Atl. Swordfish 92 SCRS Slicing
DATE: 10-02-1992 TIME: 09:58:11

CATCH AT AGE DURING YEAR

Age	78	79	80	81	82	83	84	85	86	87	88	89	90	91
0	580	1178	3306	2953	3697	4149	5187	4995	13401	20062	21823	7663	17809	1878
1	6402	10406	25881	14760	20357	29247	28526	32636	45821	73942	86496	75345	49369	27146
2	19279	27379	46023	34832	31038	54190	51459	57999	91183	116581	131234	112470	120659	70632
3	36184	33384	49655	40424	43192	55267	54705	65603	85681	107544	102232	89434	90788	81933
4	35416	32012	39174	34777	39982	48456	43471	51681	65921	73154	64261	57616	50685	48606
5	26022	22814	25818	20988	26889	30545	25256	27097	34972	37810	31660	27318	25987	24378
6	13661	14326	14852	11282	13260	15415	12365	12857	16198	18252	13186	12609	10959	10200
7	8663	8991	9327	7282	7745	8368	6325	7216	8046	7819	7606	6761	6006	5189
8	4268	4694	4697	4142	4971	4023	3165	3550	4204	4036	3595	3307	2916	2602
9	3290	3494	3228	2429	2932	2598	1984	2257	2862	2205	2028	1909	1579	1174
10	2052	2056	1926	1558	1679	1381	1106	1166	1597	1633	1097	1092	990	837
11	1074	1469	1149	928	1208	872	736	672	1006	1039	770	773	579	527
12	820	825	708	622	619	522	408	434	644	603	457	469	380	281
13	712	851	496	511	478	367	310	287	419	368	344	354	250	211
14	508	651	400	376	315	353	283	231	322	294	231	169	206	168
15+	5227	5985	5113	4757	6194	3808	2846	2833	4177	3937	2738	3096	2347	2462
TOT	164158	170515	231753	182621	204556	259561	238132	271514	376454	469279	469758	400385	381509	278224

STOCK AT AGE AT BEGINNING OF YEAR

Age	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92
1	393580	394721	417911	424414	496575	534117	567661	629541	647773	659222	657451	756482	610100	1388096	126651
2	284174	316455	313774	318805	334156	388186	410906	439018	485972	489016	473078	460344	551425	454980	1111964
3	205125	215269	234400	215444	229617	245597	269004	290051	307182	315828	295590	269487	275826	342970	308900
4	156946	135373	146184	147253	140014	149128	151388	171032	178493	174568	162177	150384	140451	144420	207160
5+	276696	263609	238444	218932	219242	198758	180196	183298	191168	176975	152702	143317	137116	135111	142253
2-4	646245	667097	694358	681501	703788	782911	831298	900101	971647	979412	930845	880215	967701	942370	1628024
2-5+	922941	930706	932802	900434	923030	981669	1011494	1083399	1162815	1156387	1083548	1023531	1104817	1077481	1770277
1-5+	1316521	1325426	1350713	1324848	1419604	1515786	1579155	1712940	1810588	1815609	1740999	1780013	1714917	2465577	1896928

F AT AGE DURING YEAR

Age	78	79	80	81	82	83	84	85	86	87	88	89	90	91
1	0.0181	0.0295	0.0707	0.0391	0.0462	0.0623	0.0570	0.0588	0.0811	0.1318	0.1564	0.1162	0.0934	0.0218
2	0.0777	0.1002	0.1760	0.1282	0.1079	0.1668	0.1483	0.1571	0.2310	0.3034	0.3627	0.3122	0.2749	0.1872
3	0.2156	0.1870	0.2649	0.2310	0.2316	0.2838	0.2529	0.2855	0.3651	0.4665	0.4758	0.4517	0.4470	0.3042
4	0.2848	0.3006	0.3481	0.3001	0.3756	0.4399	0.3781	0.4022	0.5175	0.6120	0.5676	0.5429	0.5023	0.4597
5+	0.3052	0.3222	0.3731	0.3217	0.4025	0.4715	0.4053	0.4311	0.5547	0.6559	0.6083	0.5819	0.5384	0.4927
2-4	0.1680	0.1660	0.2400	0.1954	0.1964	0.2503	0.2204	0.2406	0.3203	0.4042	0.4312	0.3902	0.3524	0.2670
2-5+	0.2072	0.2078	0.2724	0.2247	0.2417	0.2913	0.2509	0.2704	0.3553	0.4388	0.4544	0.4149	0.3737	0.2927
1-5+	0.1468	0.1513	0.2055	0.1614	0.1689	0.2045	0.1768	0.1874	0.2484	0.3162	0.3312	0.2769	0.2647	0.1313

SWO-Table 8. Summary of fishing mortality rates estimated by retrospective VPA analysis

N. Atl Retrospective
with F5+/F4 Constant Over All Years

F on Age 0

Years in VPA	'91	90	89	88	87	86	
78-91	0.0133	0.0115	0.0113	0.0257	0.0272	0.0182	
78-90	--	0.0186	0.0136	0.0229	0.0242	0.0195	
78-89	--	--	0.0226	0.0213	0.0230	0.0181	
78-88	--	--	--	0.0254	0.0216	0.0149	
78-87	--	--	--	--	0.0344	0.0138	
78-86	--	--	--	--	--	0.0210	
							$\hat{R}$
Ratio		0.62	0.5	1.01	0.79	0.87	0.76

F on Age 1

Years in VPA	91	90	89	88	87	86	
78-91	0.0218	0.0934	0.1162	0.1564	0.1318	0.0811	
78-90	--	0.1136	0.1028	0.1380	0.1419	0.0848	
78-89	--	--	0.0949	0.1302	0.1309	0.0904	
78-88	--	--	--	0.1217	0.1061	0.0724	
78-87	--	--	--	--	0.0979	0.0663	
78-86	--	--	--	--	--	0.0632	
							$\hat{R}$
Ratio		0.82	1.22	1.29	1.35	1.28	1.19

F on Age 2

Years in VPA	91	90	89	88	87	86	
78-91	0.1872	0.2749	0.3122	0.3627	0.3034	0.2310	
78-90	--	0.2374	0.2672	0.3990	0.3200	0.2381	
78-89	--	--	0.2490	0.3595	0.3463	0.2488	
78-88	--	--	--	0.2771	0.2469	0.2708	
78-87	--	--	--	--	0.2388	0.2684	
78-86	--	--	--	--	--	0.2604	
							$\hat{R}$
Ratio		1.16	1.25	1.31	1.27	0.89	1.18

F on Age 3

Years in VPA	91	90	89	88	87	86	
78-91	0.3042	0.4470	0.4517	0.4758	0.4665	0.3651	
78-90	--	0.3588	0.5230	0.5152	0.4872	0.3739	
78-89	--	--	0.4456	0.5827	0.5194	0.3870	
78-88	--	--	--	0.3917	0.5901	0.4130	
78-87	--	--	--	--	0.5820	0.5153	
78-86	--	--	--	--	--	0.5205	
							$\hat{R}$
Ratio		1.25	1.01	1.21	0.8	0.7	0.99

F on Age 4

Years in VPA	91	90	89	88	87	86	
78-91	0.4597	0.5023	0.5429	0.5676	0.612	0.5175	
78-90	--	0.6437	0.6220	0.6111	0.6365	0.5288	
78-89	--	--	0.7822	0.6845	0.6742	0.5453	
78-88	--	--	--	0.8774	0.7555	0.5779	
78-87	--	--	--	--	1.1892	0.7021	
78-86	--	--	--	--	--	0.7257	
							$\hat{R}$
Ratio		0.78	0.69	0.65	0.51	0.71	0.67

F on Age 5+

Years in VPA	91	90	89	88	87	86	
78-91	0.4927	0.5384	0.5819	0.6083	0.6559	0.5547	
78-90	--	0.6900	0.6667	0.6550	0.6822	0.5667	
78-89	--	--	0.8384	0.7336	0.7226	0.5844	
78-88	--	--	--	0.9404	0.8097	0.6194	
78-87	--	--	--	--	1.2746	0.7525	
78-86	--	--	--	--	--	0.7778	
							$\hat{R}$
Ratio		0.85	0.69	0.65	0.51	0.71	0.68

Ratio represents the ratio of the F at age from the base case VPA (data from 1978-91) to the corresponding terminal year F at age estimate for each retrospective VPA run. $\hat{R}$ represents the average of the Ratio values shown for use in retrospective adjustment.

SWO-Table 9. Results of yield-per-recruit analyses for the north Atlantic swordfish stock hypothesis

1) Selectivity at age estimated by the 1988 F's at age from the VPA base run for all ages 0 to 5+.

	F	YPR
F 88	0.608	19.328
F 0.1	0.178	19.037
F max	0.329	20.565

2) Selectivity at age estimated by the 1991 F's at age from the VPA base run for all ages 0 to 5+.

	F	YPR
F 91	0.493	22.383
F 0.1	0.201	20.566
F max	0.41	22.498

3) Selectivity at age estimated by the average F at age from the base VPA run over 1989-91 for ages 0 to 4; and the 1991 F at age from the VPA base run for ages 5+.

	F	YPR
F 91 Adjusted	0.502	20.744
F 0.1	0.186	19.465
F max	0.359	21.127

SWO-Table 10. Summary of VPA projection for swordfish stock size and fishing mortality, north Atlantic stock hypothesis

Case 1 Assuming 1990 year class strength estimated from the US age 1 CPUE index

STOCK AT AGE AT BEGINNING OF YEAR

	91	92	93	94
1	1388098	565199	566415	--
2	454980	1069019	441314	446257
3	342970	303518	746788	317707
4	144420	204277	194199	500678
5+	136447	154976	216573	262538
2-4	942370	1576814	1382300	1264643

F AT AGE DURING YEAR

	91	92	93
1	0.0612	0.0474	0.0384
2	0.2048	0.1587	0.1286
3	0.3182	0.2466	0.1998
4	0.3981	0.3085	0.2500
5+	0.3910	0.3030	0.2455
2-4	0.2730	0.1935	0.1833

Case 2 Assuming 1990 year class strength estimated from the Spanish age 1 CPUE index

STOCK AT AGE AT BEGINNING OF YEAR

	91	92	93	94
1	534639	562046	562642	--
2	454980	406250	429315	431302
3	342970	300052	272008	290430
4	144420	200664	179736	165568
5+	136447	151584	195666	212844
2-4	942370	906966	881058	887300

F AT AGE DURING YEAR

	91	92	93
1	0.0746	0.0694	0.0658
2	0.2163	0.2011	0.1908
3	0.3360	0.3125	0.2964
4	0.4204	0.3909	0.3709
5+	0.4129	0.3840	0.3643
2-4	0.2882	0.2770	0.2576

SWO-Table 11. Percentage of swordfish less than 125 cm in the total catch (in number)

	NORTH ATLANTIC					MEDIT.
YEAR	U.S.A.	SPAIN	JAPAN	CANADA	OTHERS	ALL
1978	6.8	11.6	2.8	4.7	4.3	
1979	15.8	13.4	14.0	2.1	15.8	
1980	23.7	15.8	9.0	11.6	12.7	
1981	18.5	16.9	5.7	1.6	9.1	
1982	25.1	10.8	3.3	7.8	5.7	
1983	30.2	16.0	2.1	9.7	6.4	
1984	29.7	14.3	9.6	9.3	10.6	
1985	29.5	16.7	5.0	8.8	8.5	50.5
1986	32.8	21.6	3.1	15.1	16.1	47.3
1987	36.9	25.2	8.1	24.0	20.0	56.0
1988	35.8	35.8	7.6	9.2	25.6	63.9
1989	37.7	31.2	7.2	16.4	26.7	63.8
1990	32.5	27.7	4.8	10.7	32.7	70.4
1991	21.4	19.1	1.2	11.4	20.9	64.1

SWO-Table 12. Estimated incidental swordfish catch rate (in MT) in the major north Atlantic longline fisheries which do not have directed effort on swordfish

	CHINA-TAIWAN			JAPAN			KOREA		
	SWO	TOTAL	SWO(%)	SWO	TOTAL	SWO(%)	SWO	TOTAL	SWO(%)
1978	126	10331	1.22	946	12902	7.33	634	16583	3.82
1979	260	8384	3.10	542	13084	4.14	303	11493	2.64
1980	103	8229	1.25	1167	20990	5.56	284	8742	3.25
1981	140	7967	1.76	1315	22977	5.72	136	10926	1.24
1982	200	11791	1.70	1755	25451	6.90	198	8302	2.38
1983	209	15635	1.34	537	12316	4.36	53	4483	1.18
1984	126	15920	0.79	665	13086	5.08	32	6800	0.47
1985	117	16125	0.73	921	17491	5.27	160	5757	2.78
1986	121	21454	0.56	807	12534	6.44	68	3250	2.09
1987	40	7304	0.55	413	9981	4.14	60	797	7.52
1988	18	2184	0.82	621	14892	4.17	30	602	4.98
1989	13	1376	0.94	1572	26274	5.98	320	5155	6.21
1990	207	6151	3.37	1051	17240	6.10	51	2564	1.99
1991	1	2370	0.04	943	17132	5.50	3	429	0.70

The unclassified catches (mostly sharks) are excluded from the total.
Sailfish and yellowfin catches are separated into north and south using number of fish in the Task II catch data
For recent years when Task II data are not available, the proportion for the latest year available was used

SBF-Teble 1. Atlantic and world southern bluefin catches (MT) by gear, area and country

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991*
ATLANTIC TOTAL	4680	6203	2823	2569	1138	514	1636	1476	413	1166	564	634	1215	1144
- CATCH BY GEAR														
Longline	4680	6203	2810	2563	1138	514	1636	1476	413	1162	562	628	1215	1144
Baitboat	0	0	13	6	0	0	0	0	0	0	0	1	0	0
Sport	0	0	0	0	++	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	4	2	5	0	0
- CATCH BY COUNTRY														
China-Taiwan	29	11	22	57	3	9	0	8	24	42	14	3	13	0
Japan	4651	6192	2788	2506	1135	505	1636	1468	389	1120	548	625	1202	1144
South Africa	0	0	13	6	++	0	0	0	0	0	0	1	0	0
Other	0	0	0	0	0	0	0	0	0	4	2	5	0	0
WORLD CATCHES (all oceans)	35843	38673	44754	45155	42764	42837	37089	33199	27875	25033	22402	17319	13448	13362
Longline	23653	27890	33546	28306	21263	25142	23678	20610	15344	14208	11809	11878	9129	10491
Surface	12190	10783	11208	16849	21501	17695	13411	12589	12531	10825	10593	5441	4319	2871

* Preliminary.
++ Catch <0.5 MT.
Source for "world" section: Report of the Eleventh Meeting of Australian, Japanese and New Zealand Scientists on Southern Bluefin Tuna (Shimizu, Japan - October, 1992).

SMT-Table 1. Atlantic and Mediterranean small tuna catches (in MT), by major gears

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
TOTAL																														
ATLANTIC + MEDITE	52.2	65.3	49.8	71.5	66.2	91.3	74.7	115.5	89.1	97.7	87.7	66.7	91.1	79.3	74.0	91.5	84.1	88.4	125.4	125.6	143.2	139.7	116.4	102.3	99.0	120.2	138.0	121.7	125.2	122.9
MEDITERRANEAN	12.9	29.3	18.4	30.9	26.0	46.3	30.7	60.6	25.7	33.7	21.0	11.3	13.8	10.8	12.3	15.2	16.1	20.4	28.0	35.9	41.8	44.8	25.1	27.8	25.6	31.2	36.3	23.0	36.9	31.9
ATLANTIC	39.3	36.0	31.4	40.6	40.2	45.0	44.0	54.9	63.4	64.0	66.7	55.4	77.3	68.5	61.7	76.3	68.0	68.0	97.4	89.7	101.4	94.9	91.3	74.5	73.4	89.0	101.7	98.7	88.3	91.0
ATLANTIC BONITO (*S. SARDA*)																														
ATLANTIC + MEDITE	14.8	28.2	16.8	31.4	29.1	49.1	31.9	61.7	28.7	43.9	25.0	12.3	21.4	15.6	16.0	20.7	17.3	20.0	31.7	39.3	44.4	43.0	22.5	25.1	21.8	30.3	40.2	25.4	27.7	28.7
MEDITERRANEAN	7.5	22.8	13.5	27.0	22.1	41.2	26.3	55.6	20.7	28.2	16.2	6.3	7.7	6.0	6.5	8.7	9.4	13.5	19.2	29.3	31.5	36.0	15.7	18.5	16.1	22.9	24.5	12.3	22.2	22.0
-PURSE SEINE	++	++	++	++	0.1	0.1	++	++	++	++	++	++	++	++	++	++	++	++	0.1	++	0.1	1.0	0.7	13.5	11.9	17.4	18.2	5.1	14.8	14.8
ESPANA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.6	0.6	0.4	0.0	0.0	0.0	0.0	0.0
TURKEY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.8	11.4	17.3	18.1	5.0	14.7	14.7
OTHERS	++	++	++	++	0.1	0.1	++	++	++	++	++	++	++	++	++	++	++	++	0.1	++	0.1	++	++	++	++	0.1	++	0.1	0.1	0.1
-OTHER SURFACE	0.6	0.5	0.3	0.4	0.6	0.8	0.4	0.4	0.7	0.9	0.3	0.6	0.4	0.5	1.0	1.1	0.8	0.9	0.5	1.0	1.1	0.3	0.4	0.5	0.3	0.2	1.1	0.6	0.7	0.7
MAROC	0.0	0.0	0.0	++	++	0.1	++	++	++	0.1	0.1	0.3	0.1	0.1	0.6	0.5	0.1	0.2	0.1	0.3	0.1	0.1	0.1	0.1	++	0.1	0.1	++	++	++
ESPANA	0.6	0.5	0.3	0.4	0.6	0.7	0.4	0.3	0.7	0.9	0.3	0.3	0.3	0.3	0.4	0.6	0.7	0.7	0.5	0.7	1.0	0.3	0.3	0.4	0.3	0.1	1.0	0.6	0.7	0.7
-UNCL+ LL + TRAW	6.9	22.3	13.2	26.5	21.3	40.3	25.9	55.2	20.0	27.3	15.9	5.7	7.3	5.6	5.4	7.6	8.5	12.6	18.6	28.2	30.4	34.6	14.6	4.5	3.9	5.3	5.3	6.6	6.7	6.5
ALGERIE	0.0	0.0	0.1	0.2	0.3	0.2	0.1	0.1	0.0	++	0.2	0.3	0.2	0.1	0.1	0.2	0.2	0.5	0.6	0.7	0.9	0.9	0.9	0.9	0.5	0.2	0.6	1.5	1.5	1.5
BULGARIA	0.0	0.0	0.0	1.7	1.5	2.3	1.8	2.1	0.0	0.1	0.0	0.0	0.0	0.0	++	++	++	++	++	0.2	++	++	++	++	0.0	++	0.0	0.0	++	++
EGYPT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	++	0.0	++	++	++	++	++	++	++	++	0.1	0.1	++	++	0.4	0.6	0.6
GREECE	2.0	2.2	0.9	3.2	2.3	1.8	1.7	2.0	0.9	0.6	0.6	0.5	0.5	0.7	0.5	0.6	0.6	0.7	0.8	1.3	1.4	1.4	1.7	1.3	1.0	1.8	1.3	2.5	2.5	2.5
ITALY	1.1	1.0	1.0	0.9	1.0	1.4	0.8	1.0	0.9	1.1	1.0	0.7	0.8	1.0	1.0	1.5	1.4	1.4	1.2	1.1	1.1	1.8	2.8	1.4	1.4	2.1	2.2	1.4	1.2	1.2
TUNISIE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.2	0.5	0.4	0.6	0.8	0.8	0.9	0.7	0.4	0.7	0.6	0.6	0.5	0.5	0.5	0.6	0.4	0.5	0.3
TURKEY	3.8	19.1	11.2	20.6	16.1	34.5	21.3	50.1	18.1	25.2	13.9	3.9	5.3	3.4	3.2	4.5	5.5	9.1	14.9	24.3	26.0	29.5	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OTHERS	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	++	++	++	++	++	++	++	0.0	0.0	++	++	0.0	0.0	0.0	0.0	0.0	++	++
NEI**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.5	0.7	0.4	0.4	0.5	0.6	0.3	0.3	0.3
ATLANTIC	7.3	5.4	3.3	4.4	7.0	7.9	5.7	6.0	8.0	15.7	8.8	6.1	13.6	9.4	9.5	12.0	7.8	6.5	12.8	10.1	12.8	7.3	7.0	6.7	5.7	7.5	15.9	13.2	5.8	6.7
-PURSE SEINE	0.2	0.6	0.0	0.1	0.5	0.3	0.5	2.4	4.2	3.2	2.9	1.2	2.3	0.2	0.3	2.0	2.6	1.3	2.7	0.9	++	0.3	0.1	0.5	0.5	0.2	0.3	0.1	0.4	0.3
ARGENTIN	0.2	0.6	0.0	0.1	0.5	0.3	0.5	2.4	4.2	3.2	2.9	1.2	2.3	0.2	0.3	2.0	1.7	1.3	2.6	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
USSR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OTHERS	0.0	0.0	0.0	0.0	++	0.0	0.0	0.0	0.0	0.0	0.0	++	0.0	++	0.0	0.0	++	++	0.1	0.1	++	0.3	0.1	0.5	0.5	0.2	0.3	0.1	0.4	0.3
-TROLLING	++	++	++	0.0	++	++	++	++	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	++	0.1	0.6	0.9	0.5	0.2	0.0	0.1	0.2	0.2	0.2	0.2	0.2
SENEGAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.9	0.4	0.1	0.0	0.1	0.2	0.2	0.2	0.2	0.2
OTHERS	++	++	++	0.0	++	++	++	++	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	++	0.1	++	0.0	0.2	0.1	0.0	++	0.1	++	++	0.1	0.1
-TRAP	0.6	1.0	1.0	0.7	1.6	1.3	0.5	1.0	0.7	0.9	0.5	0.3	0.2	++	0.1	0.1	0.1	0.3	0.3	0.5	0.3	0.2	0.3	0.3	0.1	0.1	0.3	0.2	0.2	0.1
ANGOLA	0.4	0.5	0.7	0.3	1.2	0.8	0.4	0.6	0.7	0.8	0.4	0.3	0.2	++	++	0.1	0.1	0.1	0.2	0.1	0.2	++	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1

SMT-Table 1. Continued

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
OTHERS	0.1	0.5	0.3	0.3	0.4	0.4	0.1	0.4	0.1	0.1	0.1	++	++	++	++	++	++	0.1	0.1	0.4	0.1	0.2	- 0.2	0.2	0.1	0.1	0.1	0.1	++	++
-OTHER SURFACE	6.2	3.6	2.0	3.3	4.5	5.6	4.3	1.9	2.4	11.0	4.6	3.9	8.7	6.5	7.3	4.8	3.8	2.0	8.7	6.8	8.8	4.5	3.3	4.1	3.9	4.9	2.6	3.3	2.5	2.7
ANGOLA	0.1	++	++	0.1	0.2	0.1	++	0.1	0.2	0.1	0.2	0.2	0.2	++	0.8	0.8	0.5	0.1	0.2	0.1	0.1	0.1	0.1	0.1	++	0.1	++	0.1	++	++
BRASIL	3.0	1.6	0.8	1.4	1.5	3.4	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	0.2	0.2	0.5	0.3	0.2	0.3	0.1	0.1
GHANA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	++	0.0	++	++	0.0	0.1	++	0.1	++	++	++	0.0	0.9	0.0	0.0	0.0	0.0
MARTINIQ	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.4	0.5	0.5	0.4	0.5	0.5	0.5	0.6	0.5	0.6	0.5	0.4	0.3	0.4	0.4	0.4	0.4
MAROC	0.7	0.7	0.4	0.3	0.7	0.3	0.5	0.4	0.2	0.2	0.1	0.1	0.2	0.3	0.3	0.1	0.2	0.2	0.3	0.5	0.5	0.4	0.2	0.0	0.0	0.4	0.6	0.6	0.3	0.5
SENEGAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	++	0.2	0.6	0.5	0.2	0.1	0.1	++	0.2	++	0.4	0.3	0.5	0.0	0.0	0.0	0.0
ESPANA	2.4	1.3	0.8	1.5	2.1	1.8	0.8	1.0	1.6	10.0	3.5	2.0	7.0	4.8	4.3	2.0	1.9	0.6	0.1	0.2	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
USSR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.4	4.6	6.3	2.4	1.3	2.1	1.1	1.1	0.0	0.0	0.0	0.0
VENEZUEL	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4	0.3	0.5	0.5	0.7	0.5	0.6	0.8	0.8	0.4	0.4	0.9	0.8	0.9	0.6	0.7	0.8	1.4	1.0	1.2	1.8	1.5	1.5
OTHERS	++	++	++	++	++	++	++	++	0.0	0.0	0.0	0.4	0.4	0.4	0.3	++	++	++	++	0.1	++	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2
-UNCL+ LL + TRAW	0.3	0.2	0.3	0.3	0.4	0.7	0.4	0.7	0.7	0.6	0.8	0.7	2.4	2.7	1.8	5.1	1.3	2.9	1.0	1.3	2.8	1.8	3.1	1.8	1.1	2.1	12.5	9.4	2.5	3.4
ARGENTIN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.3	2.1	1.4	0.7	1.6	2.8	1.3	1.2	1.8
MEXICO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.2	0.4	0.4	0.2	0.1	0.1	0.2	0.3	0.4	0.4	0.6	0.7	0.2	0.2	0.4	0.4	0.3	0.2	0.2
USA	++	++	0.0	0.0	++	0.0	0.0	++	0.1	0.1	++	0.3	0.1	0.1	++	0.3	0.2	0.5	0.2	0.3	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.3	0.3	0.4
USSR	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.1	0.2	++	1.4	1.5	1.3	4.2	0.8	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.9	7.4	0.7	0.9
OTHERS	0.3	0.2	0.3	0.3	0.4	0.7	0.3	0.3	0.2	0.2	0.3	0.2	0.5	0.7	0.3	0.5	0.2	0.1	0.5	0.6	0.4	0.6	0.1	0.1	0.1	++	0.3	0.1	0.1	0.1
ATLANTIC BLACK SKIPJACK (*E. ALLETTERATUS*)																														
ATLANTIC + MEDITE	5.0	3.9	1.7	4.1	3.3	4.0	3.2	3.6	8.8	5.8	3.2	2.5	4.0	8.3	10.0	7.9	17.6	14.6	19.4	14.4	14.2	22.5	17.6	13.4	11.5	17.1	22.5	22.0	24.2	24.0
MEDITERRANEAN	++	++	++	++	++	++	0.2	1.0	1.0	0.9	0.9	1.1	1.3	1.4	2.0	2.5	2.5	2.9	2.8	1.4	2.5	1.6	1.7	2.0	2.2	2.4	2.4	2.0	2.6	1.8
-SURFACE	++	++	++	++	++	++	0.2	0.9	0.7	0.5	0.6	0.8	0.8	0.9	1.3	1.3	1.6	2.2	2.2	1.1	1.7	1.0	1.0	1.2	1.1	1.5	1.6	1.0	1.2	1.1
ESPANA	++	++	++	++	++	++	0.1	0.9	0.6	0.4	0.6	0.7	0.7	0.7	1.1	1.1	1.2	1.0	0.8	++	0.7	0.0	++	++	++	0.0	++	0.0	0.0	0.0
TUNISIE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	++	++	0.1	0.1	0.1	0.2	0.4	1.2	1.4	1.0	1.0	1.0	1.0	1.2	1.1	1.5	1.6	1.0	1.2	1.1
OTHERS	++	++	++	++	++	++	++	++	++	++	++	++	++	0.1	++	++	0.0	++	0.0	0.1	++	++	++	++	++	++	++	++	++	++
-UNCL+ LL + TRAW	0.0	0.0	0.0	++	++	++	++	++	0.3	0.3	0.3	0.3	0.5	0.5	0.8	1.2	0.9	0.7	0.6	0.4	0.8	0.5	0.6	0.8	1.1	0.9	0.8	1.0	1.4	0.7
TUNISIE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.8	0.6	0.4	0.4	0.2	0.3	0.2	0.3	0.3	0.5	0.3	0.3	0.6	0.9	0.2
OTHERS	0.0	0.0	0.0	++	++	++	++	++	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.4	0.3	0.3	0.2	0.1	0.4	0.3	0.4	0.6	0.6	0.6	0.5	0.5	0.5	0.5
ATLANTIC	5.0	3.9	1.7	4.1	3.3	4.0	3.0	2.6	7.8	4.9	2.3	1.4	2.7	6.9	8.0	5.4	15.1	11.7	16.6	13.0	11.7	20.9	15.9	11.4	9.3	14.7	20.1	20.0	21.6	22.2
-BAITBOAT	++	++	++	++	0.1	0.7	0.3	0.6	1.9	1.1	0.6	0.2	0.5	0.5	0.2	0.7	0.4	0.6	1.3	1.1	1.4	1.2	1.6	2.1	1.8	1.7	0.9	1.7	3.7	4.3
ANGOLA	++	++	++	++	0.1	0.7	0.3	0.6	1.2	0.7	0.3	0.2	0.4	0.4	++	0.6	0.3	0.5	0.8	0.7	1.1	1.2	1.3	1.3	1.1	1.3	0.5	0.4	0.1	++
GHANA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	0.1	0.1	0.1	0.1	0.1	0.1	++	++	++	0.0	0.3	0.7	0.5	0.3	0.3	1.2	3.5	3.5
ESPANA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.4	0.3	++	0.0	0.0	0.0	0.0	0.0	0.0	++	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	0.0	0.0	0.0
VENEZUEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6

SMT-Table 1. Continued

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	++	++	- 0.5	0.3	0.3	++	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
-PURSE SEINE	0.0	0.0	0.0	0.0	++	0.0	0.0	0.0	0.0	0.4	0.0	++	0.1	0.1	0.1	++	5.5	++	0.8	1.9	3.0	2.7	1.2	2.5	1.1	2.7	2.9	2.9	2.8	4.1
FRANCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
GHANA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	++	0.0	0.0	0.0	0.0	0.4	0.6	0.0	0.3	0.2	0.1	++	0.0	0.0	0.0	0.0
SENEGAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.3	0.7	1.0	0.5	1.0	0.6	2.6	2.1	2.1	2.1	2.1
USSR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	0.0	5.5	0.0	0.0	0.0	0.4	1.6	0.4	0.9	0.3	0.1	0.8	0.5	0.7	0.6
VENEZUEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3
OTHERS	0.0	0.0	0.0	0.0	++	0.0	0.0	0.0	0.0	0.4	0.0	++	0.1	0.1	0.0	++	0.1	++	0.3	0.1	++	++	++	0.5	0.1	++	++	++	0.1	++
-TROLLING	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	++	++	++	++	0.1	1.3	1.5	2.5	0.9	1.2	0.8	1.0	1.5	1.5	1.5	1.5
SENEGAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.5	2.5	0.9	1.2	0.8	1.0	1.5	1.5	1.5	1.5
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	++	++	++	++	0.1	++	++	++	++	++	++	++	++	++	++	++
-TRAP	4.8	3.7	1.4	2.9	2.8	3.1	2.4	1.4	1.8	1.1	0.5	0.6	0.7	0.1	++	0.2	0.1	0.2	0.4	0.4	0.6	0.5	0.4	0.2	++	0.1	0.6	0.7	0.3	0.3
ANGOLA	4.8	3.7	1.4	2.7	2.7	3.1	2.4	1.4	1.7	1.1	0.5	0.6	0.7	0.1	++	0.2	++	0.2	0.4	0.4	0.6	0.4	0.3	0.1	++	0.1	0.6	0.7	0.2	0.3
OTHERS	++	++	++	0.2	++	++	++	0.1	++	++	++	++	++	0.0	0.0	0.0	++	0.0	++	++	0.0	0.1	++	0.1	++	++	++	++	0.1	0.1
-OTHER SURFACE	0.2	0.2	0.3	1.2	0.4	0.2	0.3	0.6	3.9	2.3	0.9	0.5	1.1	6.1	7.7	4.4	9.1	10.9	13.8	8.1	3.8	13.0	11.1	5.2	5.5	9.2	13.1	13.2	13.2	11.9
ANGOLA	0.2	0.2	0.3	0.8	0.4	0.2	0.1	0.1	3.2	0.6	0.5	0.1	0.2	++	0.0	0.5	0.5	++	0.1	++	++	++	++	++	++	++	++	++	0.1	0.0	0.0
BRASIL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7	0.4	0.1	0.1	0.1	0.1	0.3
GHANA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	6.0	1.1	6.0	5.4	4.1	2.9	1.5	5.0	5.4	0.0	++	5.2	11.3	11.3	11.3	11.3
MAROC	0.0	0.0	0.0	++	0.1	0.0	0.2	0.4	0.3	0.6	0.1	++	++	0.1	++	++	++	0.3	++	++	++	0.0	++	0.0	0.0	0.1	++	++	0.2	++
SENEGAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.1	0.7	1.5	1.4	1.7	1.9	0.6	1.1	2.4	3.8	3.0	3.6	2.1	0.0	0.0	0.0	0.0
ESPANA	++	++	++	0.4	0.0	0.0	0.0	++	0.1	0.7	++	++	0.0	++	++	++	++	++	0.5	++	++	0.0	++	0.0	0.0	0.0	0.0	0.0	0.0	0.0
USSR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.7	0.7	2.2	6.3	3.6	0.6	4.9	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
VENEZUEL	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.2	0.3	0.4	0.4	0.5	0.4	0.4	1.3	0.7	0.8	0.3	0.6	0.6	1.0	1.1	1.5	1.2	1.4	1.3	0.0
OTHERS	0.0	++	0.0	0.0	0.0	++	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.3	0.3	0.2	0.4	0.4	0.3	0.3
-UNCL+ LL + TRAW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.3	0.1	0.3	0.1	0.0	0.1	0.0	0.0	0.2	0.2	1.4	1.0	0.7	0.2	0.1	0.0	1.1	0.0	0.1	0.1
GERMANY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.5	0.1	++	++	++	0.0	++	++	0.0
ISRAEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.6	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
USSR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0
OTHERS	0.0	0.0	0.0	0.0	++	0.0	0.0	0.0	0.2	++	0.3	0.1	0.3	0.1	++	0.1	++	++	++	++	0.4	0.2	0.3	0.1	0.1	++	0.2	++	0.1	0.1

SMT-Table 1. Continued

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
FRIGATE TUNA (*A. THAZARD*) **																														
ATLANTIC + MEDITE	8.2	8.0	6.8	9.5	7.2	11.5	8.6	16.2	11.6	10.3	13.6	10.2	13.9	10.5	9.7	20.0	8.3	12.6	20.9	14.8	24.0	20.2	25.3	22.5	18.0	20.8	21.1	18.1	19.7	14.0
MEDITERRANEAN	4.0	4.4	2.8	2.6	2.7	4.6	3.1	2.8	3.4	4.1	3.4	3.5	4.4	2.6	3.3	3.4	3.6	3.7	4.0	3.7	6.0	5.8	6.3	5.2	5.1	3.7	6.1	6.4	7.5	5.9
-PURSE SEINE	++	0.1	0.1	0.1	++	0.1	0.1	0.1	++	++	++	++	++	++	++	++	++	0.1	++	++	0.2	1.7	1.7	1.5	1.4	0.3	0.3	0.1	0.1	0.1
ESPANA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	1.6	1.4	1.3	0.0	0.0	0.0	0.0	0.0
OTHERS	++	0.1	0.1	0.1	++	0.1	0.1	0.1	++	++	++	++	++	++	++	++	++	0.1	++	++	0.2	++	0.1	0.1	0.1	0.3	0.3	0.1	0.1	0.1
-TRAP	++	0.5	0.4	0.7	0.7	0.7	1.0	0.6	0.2	0.4	0.4	0.4	0.8	0.1	0.4	0.5	0.3	0.1	++	0.1	0.2	0.5	0.7	0.6	0.3	0.7	1.3	2.2	2.3	1.5
MAROC	0.0	0.0	0.0	0.5	0.4	0.4	0.6	0.1	0.1	0.2	0.1	0.1	0.3	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	++	0.0	0.1	0.2	0.1
ESPANA	++	0.5	0.4	0.2	0.3	0.3	0.3	0.5	0.1	0.2	0.3	0.2	0.5	0.1	0.2	0.4	0.3	0.1	++	0.1	0.2	0.5	0.7	0.6	0.3	0.6	1.3	2.1	2.1	1.4
-OTHER SURFACE	3.1	2.9	1.8	1.2	1.1	2.6	0.8	1.1	1.9	1.9	1.1	1.8	1.9	1.3	1.5	0.9	1.4	1.7	2.1	1.6	1.8	0.1	0.1	0.1	0.2	0.2	2.1	1.5	2.1	1.4
MAROC	0.3	0.7	0.7	++	++	++	++	++	++	++	0.1	0.3	0.1	0.0	0.1	0.1	0.1	0.1	++	++	0.1	0.1	0.1	++	0.2	0.2	0.8	1.1	1.2	0.6
ESPANA	2.9	2.1	1.2	1.2	1.1	2.6	0.8	1.1	1.8	1.9	1.1	1.5	1.9	1.3	1.4	0.8	1.3	1.6	2.1	1.6	1.7	0.0	++	++	++	0.0	1.3	0.4	0.9	0.9
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++
-UNCL+ LL + TRAW	0.8	0.9	0.5	0.7	0.9	1.2	1.2	1.1	1.3	1.8	1.9	1.4	1.6	1.2	1.3	2.0	1.8	1.8	1.8	1.9	3.8	3.6	3.9	3.0	3.2	2.6	2.3	2.5	3.0	2.8
GREECE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.2	1.9	2.1	1.4	1.4	1.4	1.4	1.4	1.4	1.4
ITALY	0.7	0.8	0.5	0.7	0.9	1.2	1.2	1.1	1.1	1.6	1.7	1.2	1.3	0.9	0.9	1.1	1.2	1.3	1.4	1.2	1.3	1.5	1.6	1.3	1.3	0.9	0.6	0.5	0.5	0.5
TUNISIE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.8	0.6	0.4	0.4	0.2	0.3	0.2	0.3	0.3	0.5	0.3	0.3	0.6	0.9	0.9
OTHERS	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	0.2	++
ATLANTIC	4.2	3.6	4.0	6.9	4.5	7.0	5.5	13.4	8.2	6.2	10.2	6.6	9.6	7.9	6.5	16.6	4.8	8.9	17.0	11.1	17.9	14.4	19.0	17.2	12.9	17.1	15.0	11.7	12.2	8.1
-BAITBOAT	0.0	0.1	0.0	0.9	0.4	0.6	1.6	3.2	3.1	0.3	0.2	1.7	0.7	0.1	++	0.1	0.1	0.3	0.2	0.3	0.5	0.4	0.4	0.3	0.2	0.5	0.2	0.2	0.2	0.3
JAPAN	0.0	0.0	0.0	0.9	0.4	0.6	1.6	3.2	3.1	0.0	++	1.2	0.5	++	++	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OTHERS	0.0	0.1	0.0	++	++	0.0	++	++	++	0.3	0.2	0.4	0.2	0.1	++	++	0.1	0.3	0.2	0.3	0.5	0.4	0.4	0.3	0.2	0.5	0.2	0.2	0.2	0.3
-PURSE SEINE	0.0	0.0	0.0	0.0	0.0	0.4	1.3	0.2	0.7	0.7	1.3	0.2	++	++	++	0.0	1.2	0.8	6.0	5.4	4.6	4.7	8.7	5.3	3.6	6.1	4.9	2.5	2.7	1.8
FRANCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7	1.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
JAPAN	0.0	0.0	0.0	0.0	0.0	0.4	1.3	0.2	0.7	0.6	1.2	0.2	++	++	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAROC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	1.1	0.5	++	++	0.4	0.2	0.0	0.0	0.1	0.1
SENEGAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
ESPANA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.8	5.8	4.7	2.5	2.5	5.5	3.6	3.1	4.4	3.8	1.6	1.7	0.5
USSR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	0.0	0.6	0.0	0.0	0.0	0.4	0.3	3.1	1.6	0.1	0.2	0.4	0.3	0.7	0.4
VENEZUEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	0.0	0.4	0.3	0.5	0.0	0.0
NEI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	++	0.0	0.0	++	0.4	0.2	0.2	0.9
OTHERS	0.0	0.0	0.0	0.0	0.0	++	++	0.0	0.0	0.0	0.2	++	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	++	++	++	++	++	++	++

SMT-Table 1. Continued

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
-TRAP	1.9	0.9	1.3	2.8	2.1	1.6	0.8	1.1	0.9	0.6	0.9	1.0	0.8	0.3	0.3	0.3	0.3	0.4	0.1	0.2	0.3	0.2	0.1	0.1	0.1	-0.2	0.1	0.4	0.8	0.5
ANGOLA	1.2	0.9	0.8	1.6	1.4	1.1	0.5	0.7	0.3	0.4	0.4	0.5	0.7	0.2	++	0.1	0.1	0.1	++	0.1	0.1	0.1	0.1	++	0.0	0.0	++	++	++	0.0
MAROC	0.0	0.0	0.0	0.8	0.3	0.2	0.1	++	0.4	++	0.3	0.1	0.1	0.0	0.0	++	0.0	0.0	0.1	++	0.0	++	0.0	0.0	0.0	0.0	++	0.1	0.2	0.3
ESPANA	0.7	++	0.5	0.4	0.5	0.2	0.2	0.3	0.1	0.1	0.3	0.4	0.1	0.2	0.3	0.2	0.2	0.3	++	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.3	0.6	0.2
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	++	++	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-OTHER & UNCL GE	2.3	2.6	2.7	3.2	1.9	4.3	1.8	8.9	3.5	4.7	7.7	3.8	8.0	7.4	6.1	16.2	3.1	7.4	10.6	5.2	12.5	9.0	9.8	11.5	9.0	10.3	9.7	8.7	8.4	5.5
ANGOLA	0.3	0.3	0.1	0.1	0.1	0.1	0.2	++	0.2	0.5	1.7	0.2	0.6	0.3	0.0	0.1	0.1	++	++	++	++	++	++	0.0	++	++	0.0	++	0.0	0.0
BRASIL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.7	0.9	1.7	0.6	0.4	0.2
GHANA	0.0	0.0	0.0	0.0	0.0	2.2	0.9	8.2	2.0	1.8	5.1	1.6	6.3	6.0	4.3	13.9	1.0	4.3	7.6	2.0	6.1	5.6	4.5	4.5	3.3	4.7	0.0	0.0	0.0	0.0
MAROC	0.3	1.0	0.8	0.5	0.1	0.5	0.1	0.1	0.5	0.1	++	1.0	0.1	++	0.3	0.7	0.8	0.7	0.7	1.3	0.1	0.7	0.2	0.4	0.0	0.5	0.2	0.5	0.4	0.5
ESPANA	0.7	0.4	0.4	0.8	0.4	0.4	0.3	0.2	0.1	1.8	0.2	0.2	0.1	0.1	0.2	0.4	0.4	0.1	0.4	0.5	0.4	0.0	0.2	++	++	0.0	++	0.0	0.0	0.0
USSR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.5	0.7	0.4	5.2	1.3	2.8	4.4	3.3	2.7	5.5	5.5	5.6	2.8
VENEZUEL	1.0	1.0	1.4	1.8	1.4	1.1	0.4	0.4	0.7	0.5	0.6	0.7	0.9	1.0	1.3	0.9	0.6	1.8	1.2	0.9	0.5	1.2	1.5	1.7	1.6	1.4	2.2	2.1	2.0	2.0
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	++	0.1	0.2	0.1	0.1	0.1	0.1	++	++	++	0.0	++
SPOTTED SPANISH MACKEREL (*S. MACULATUS*)																														
ATLANTIC	11.6	11.1	10.1	11.9	13.5	12.8	12.9	12.5	15.9	13.9	16.8	20.0	21.0	18.2	14.6	15.5	14.9	14.6	19.5	17.9	19.6	17.3	20.7	16.1	21.7	21.9	20.6	22.9	18.1	18.0
-LONGLINE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.5	0.4	0.1	0.0	0.1	0.2	0.1	0.3	0.1	0.1	0.1	0.5	0.2	0.2	0.1	0.0
CUBA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.5	0.4	0.1	0.0	0.1	0.2	0.1	0.3	0.1	0.1	0.1	0.5	0.2	0.2	0.1	0.0
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	0.0	0.0	0.0	0.0	0.0	0.0
-TROLLING	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4	0.5	1.3	0.4	0.1	0.2	++	0.1	0.4	0.1	0.1	0.5	0.5
CUBA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4	0.5	0.4	0.4	0.1	0.1	++	0.1	0.4	0.1	0.1	0.5	0.5
USA	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	0.8	0.0	++	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-OTHER SURFACE	8.5	7.4	7.8	8.3	9.1	7.8	7.1	7.2	4.5	3.9	5.5	7.9	9.7	5.4	2.6	3.4	3.8	4.1	11.5	9.2	10.1	9.9	13.6	9.1	14.2	13.2	13.6	14.0	7.8	8.0
BRASIL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	1.2	2.8	4.4	6.3	2.7	0.3	1.0	1.5	1.2	2.8	3.5	4.3	4.5	6.3	1.5	5.0	4.7	5.1	5.9	0.0	++
CUBA	1.0	0.7	1.2	1.6	1.3	1.1	0.8	0.8	0.9	0.5	0.5	0.7	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.3	0.5	0.7	0.5	0.5	0.0	0.0
DOMINR	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.4	0.5	0.5	0.4	0.2	1.1	1.3	1.3	1.3	1.4	1.4	1.3	1.3
USA	4.2	3.4	2.7	3.5	4.2	3.5	5.3	4.9	0.0	0.0	0.0	0.0	0.0	++	0.0	0.0	0.0	0.0	5.4	2.8	3.7	2.8	3.9	4.0	5.9	5.0	4.9	4.2	4.0	4.2
VENEZUEL	3.3	3.3	3.9	3.2	3.5	3.0	0.8	1.3	1.5	2.0	2.0	2.5	2.5	2.4	2.0	2.2	2.0	2.5	2.8	2.4	1.7	2.1	1.9	2.0	1.5	1.5	1.7	2.0	2.5	2.5
-UNCL + TRAWL	3.0	3.6	2.2	3.5	4.3	4.9	5.7	5.2	11.4	10.0	11.3	12.1	11.3	12.2	11.5	11.7	10.5	10.1	7.4	7.2	9.0	7.0	6.8	6.9	7.3	7.8	6.7	8.6	9.7	9.5
COLOMBIA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.6	0.1	0.2	0.3	0.4	0.2	0.3	0.2	0.2	0.2	0.4	++	++	0.1	0.1	0.1	0.1	0.2	0.1	0.1	++
MEXICO	3.0	3.6	2.2	3.5	4.3	4.9	5.7	5.2	4.8	3.5	5.3	6.7	5.2	4.8	3.4	4.4	5.1	5.8	5.9	5.9	7.8	5.9	5.8	5.8	6.2	6.5	5.2	7.2	8.2	8.4
TRINIDAD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.2	1.0	0.8	0.8	1.7	1.5	1.5	1.9	1.2	1.3	0.9	1.2	1.1	0.9	1.0	1.0	1.1	1.1	1.0	1.1	1.1
USA	++	++	++	++	++	++	++	++	5.5	4.7	4.9	4.4	5.0	5.3	6.4	5.5	3.3	2.9	++	++	0.0	++	++	++	++	0.1	0.2	0.3	0.3	0.0
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	++	0.0	++	++	++	++	++	++	++	0.0	0.0	++	++	++

SMT-Table 1. Continued

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
KING MACKEREL (*S. CAVALLA*)																														
ATLANTIC	2.9	3.3	2.8	3.2	3.0	3.9	5.3	5.4	6.4	6.4	7.3	9.7	13.6	9.1	8.3	8.7	6.7	11.4	15.6	18.5	18.0	14.6	13.0	9.9	12.1	11.8	12.2	11.8	9.7	9.2
ARGENTIN	++	++	++	0.0	0.0	++	++	0.0	0.0	++	0.0	0.0	0.0	0.0	0.5	1.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BRASIL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.9	2.5	3.3	5.2	2.2	0.5	0.8	0.8	0.8	1.6	1.6	1.9	2.7	2.6	0.8	2.9	2.2	2.0	2.1	++	++
MEXICO	1.0	1.0	0.9	1.0	0.9	1.0	0.7	1.1	0.9	1.3	1.5	2.2	1.5	1.4	1.5	1.3	1.5	2.2	1.9	2.7	4.4	2.9	2.2	2.3	2.6	3.1	3.1	2.3	2.7	2.1
USA	1.9	2.3	1.6	2.1	2.1	2.8	2.8	2.8	3.0	2.6	2.2	2.7	4.7	3.1	4.1	3.8	2.5	6.3	10.7	12.6	9.8	7.1	7.3	6.0	5.7	5.6	5.8	5.9	5.9	5.9
VENEZUEL	0.0	0.0	0.3	0.1	0.0	0.1	1.8	1.5	1.0	1.6	1.1	1.5	2.2	2.4	1.7	1.6	1.3	2.0	1.4	1.6	1.9	1.9	0.9	0.8	0.9	0.9	1.3	1.5	1.1	1.2
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	0.0	0.2	0.2	0.1	++	++	++	++	++	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WEST AFRICAN SPANISH MACKEREL (*S. TRITOR*)																														
ATLANTIC	0.0	0.0	0.0	0.0	0.0	0.0	1.8	2.7	0.2	1.3	2.1	1.6	4.7	1.1	1.9	2.6	6.7	4.2	4.9	2.6	5.0	5.1	4.2	4.4	3.2	1.7	3.2	3.6	4.6	4.6
GERMANY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.5	++	++	0.0	0.0	0.0	0.0	0.0	0.0
GHANA	0.0	0.0	0.0	0.0	0.0	0.0	1.8	2.5	0.0	0.7	1.5	1.0	3.5	0.6	0.6	0.7	0.8	1.6	4.4	2.0	3.0	2.2	3.0	3.0	1.5	0.0	1.5	1.5	1.5	2.8
SENEGAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	1.3	1.2	1.1	1.1	0.4	0.5	0.3	1.1	0.9	1.1	1.4	1.7	1.6	1.6	1.6	1.6
USSR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.6	0.6	0.6	0.8	0.2	0.1	0.6	4.8	1.4	0.0	0.0	0.6	1.2	0.2	0.2	0.2	++	0.1	0.2	1.2	0.0
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	++	0.1	++	0.1	0.1	0.2	++	++	0.1	0.1	++	++	0.3	0.2	0.2
BLACKFIN TUNA (*T. ATLANTICUS*)																														
ATLANTIC	0.7	0.8	0.8	0.7	0.7	0.9	0.7	0.8	2.0	1.9	1.9	0.9	1.1	0.8	1.0	1.3	1.3	1.2	1.2	2.0	1.9	1.7	1.9	1.4	1.9	2.1	2.8	2.8	3.5	3.5
CUBA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.6	0.6	0.5	0.2	0.5	0.6	0.3	0.3	0.5	0.5
DOMINR	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	++	0.6	0.5	0.5
GUADELOU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1	0.2	0.2	0.2	0.2	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5
MARTINIQ	0.7	0.7	0.7	0.6	0.6	0.8	0.5	0.6	0.6	0.5	0.3	0.1	0.4	0.3	0.6	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.4	0.4	0.4	0.4
VENEZUEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.1	0.7	1.3	1.3
OTHERS	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.4	0.3	0.2	0.2	0.4	0.3	0.3	0.3	0.4	0.3	0.2	0.5	0.4	0.5	0.5	0.6	0.4	0.4	0.4
WAHOO (*A. SOLANDRI*)																														
ATLANTIC	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.4	0.4	0.4	0.3	0.4	0.3	0.4	0.4	0.5	0.8	0.6	2.9	2.3	2.4	2.2	0.9	1.1	1.3	1.6	1.5	1.6	1.4
CAP VERT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	2.3	1.5	1.6	1.4	0.1	0.2	0.3	0.3	0.6	0.7	0.6
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.4	0.4	0.4	0.3	0.4	0.3	0.4	0.4	0.5	0.8	0.6	0.6	0.8	0.8	0.8	0.8	0.9	1.0	1.2	0.9	0.9	0.8
CERO (*S. REGALIS*)																														
ATLANTIC	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.5	0.8	0.8	0.8	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.5	0.4	0.2	0.2	0.2	0.2
MARTINIQ	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.5	0.4	0.2	0.3	0.2	0.5	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.5	0.4	0.3	0.2	0.2	0.2	0.2
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	++	0.1	0.1	0.1	0.1

SMT-Table 1. Continued

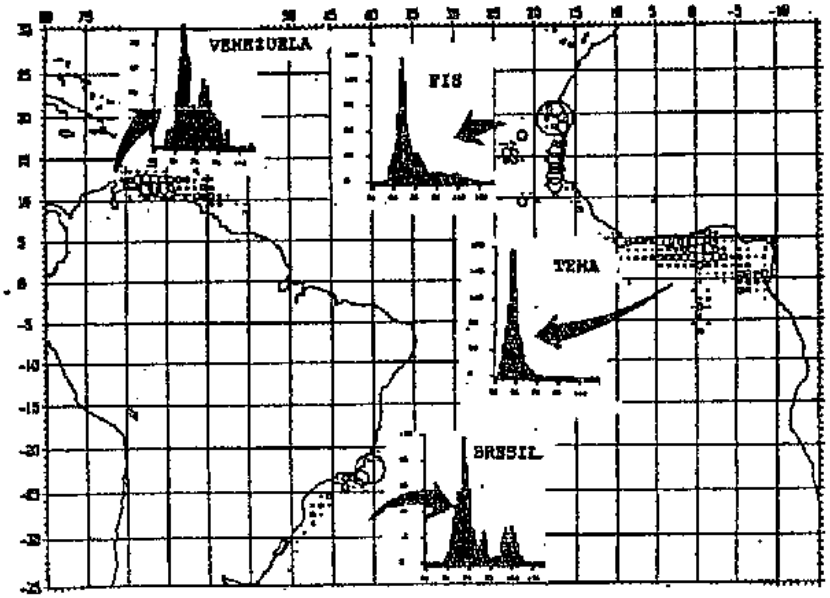
	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
SCOMBEROMORUS UNCLASSIFIED (S. SPP)																														
ATLANTIC	1.6	1.5	1.8	1.8	1.9	2.1	2.1	3.4	0.5	0.4	0.3	0.5	0.5	0.8	0.5	0.5	0.4	0.2	0.2	0.3	0.3	0.2	0.7	0.2	0.2	0.3	0.3	0.2	0.2	0.2
BRASIL	1.0	1.0	1.1	1.1	1.3	1.5	1.6	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COLOMBIA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.1	0.2	0.3	0.4	0.1	0.1	0.1	0.1	0.1	0.2	0.1	++	0.5	++	++	0.1	0.2	++	++	++
OTHERS	0.6	0.5	0.7	0.7	0.6	0.6	0.5	0.4	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.3	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
PLAIN BONITO (O UNICOLOR)																														
ATLANTIC + MEDITE	3.0	3.1	2.3	0.2	0.3	0.7	0.2	1.3	0.8	0.7	0.3	0.1	0.2	0.1	0.2	0.5	1.0	0.5	0.7	1.4	0.6	++	++	0.1	0.1	0.6	1.5	1.1	0.3	0.4
MEDITERRANEAN	0.0	0.0	0.0	++	++	++	++	++	++	++	++	++	++	0.0	0.0	0.1	0.2	++	0.0	0.0	0.0	0.0	0.0	++	++	0.0	++	++	++	++
OTHERS	0.0	0.0	0.0	++	++	++	++	++	++	++	++	++	++	0.0	0.0	0.1	0.2	++	0.0	0.0	0.0	0.0	0.0	++	++	0.0	++	++	++	++
ATLANTIC	3.0	3.1	2.3	0.2	0.3	0.7	0.2	1.3	0.8	0.7	0.3	0.1	0.1	0.1	0.2	0.3	0.8	0.5	0.7	1.4	0.6	++	++	0.1	0.1	0.6	1.5	1.1	0.3	0.4
MAURITAN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.1	++	++	++	0.1	0.1	0.1	0.1	0.1	0.1
MAROC	3.0	3.1	2.3	0.2	0.3	0.7	0.2	1.3	0.8	0.6	0.2	++	++	++	0.1	0.2	0.7	0.4	0.6	1.0	0.5	0.0	0.0	0.1	++	0.5	1.4	1.1	0.3	0.3
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	++	++	++	++	++	++	++	++	++	++	++	++
MIXED OR UNKNOWN TUNA-LIKE SPECIES																														
ATLANTIC + MEDITE	4.5	5.4	6.6	8.6	7.2	6.3	7.7	7.9	13.2	11.8	16.1	7.9	8.2	13.0	10.4	12.4	8.7	7.6	9.6	8.1	9.2	7.3	6.5	7.0	6.8	6.6	6.3	7.3	9.0	8.2
MEDITERRANEAN	1.4	2.1	2.1	1.3	1.2	0.5	1.1	1.2	0.6	0.5	0.5	0.4	0.4	0.8	0.5	0.5	0.4	0.3	2.0	1.5	1.8	1.4	1.4	2.1	2.2	2.2	3.3	2.3	4.6	2.2
GREECE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	++	0.1	0.1	0.1	0.1	0.5	0.5	0.5
ISRAEL	1.0	0.9	1.1	0.2	0.3	0.0	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LEBANON	0.4	0.5	0.5	0.5	0.3	0.2	0.3	0.8	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2
ESPANA	0.0	0.7	0.5	0.6	0.6	0.3	0.5	0.2	0.3	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TUNISIE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.1	0.1	0.2	0.4	0.3	0.3	0.1	1.8	1.3	1.5	1.2	1.3	1.8	1.9	1.9	3.0	1.7	3.9	1.6
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	++	++	++	++	++	++	++	++	++	++	++	0.1	0.1	0.1	0.1	++	++	++
ATLANTIC	3.0	3.3	4.6	7.4	6.0	5.7	6.6	6.7	12.7	11.4	15.5	7.4	9.4	13.3	10.2	12.4	8.3	7.4	7.7	9.3	10.6	10.3	6.0	5.6	4.7	9.6	8.3	9.7	10.5	16.5
BRASIL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	0.3	0.7	0.4	0.6	++	0.7	0.4	++	++	++	0.3	0.1	++	++	++
CHITAIW	0.0	0.0	0.0	++	++	0.2	0.4	1.1	0.8	0.7	0.9	1.0	0.9	0.4	1.0	++	0.5	1.3	0.8	0.8	1.1	0.8	++	++	++	0.1	0.3	0.1	1.1	0.2	2.0
COLOMBIA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	0.1	++	++	++	++	++	++	0.3	++	0.3	1.0	0.7	0.9	0.8	1.2	0.3	0.1
CIVOIRE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.9	0.4	0.4	++	0.1	0.2	2.9	3.1	4.4	1.0	0.7	++	5.3	5.3	4.7	6.1	10.4
CUBA	0.0	0.0	0.0	0.0	0.0	++	++	0.0	0.0	0.4	0.6	1.1	0.3	1.0	0.4	0.1	0.1	0.1	++	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EGUINEA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4
GHANA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.9	0.0	0.0	0.9	0.5	0.7	1.0	0.4	0.1	0.2	0.2	0.6	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GUADELOU	0.9	1.0	1.0	1.0	0.8	1.0	1.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ISRAEL	0.0	0.0	0.0	0.5	0.1	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
JAPAN	1.1	1.5	2.7	5.2	4.8	3.3	1.5	1.1	1.6	1.5	1.0	0.5	0.6	0.4	1.0	0.8	1.0	1.6	1.3	0.8	0.7	0.1	0.3	0.5	0.4	0.3	0.4	0.4	2.2	2.2
KOREA	0.0	0.0	0.0	0.0	0.0	0.0	2.4	1.0	7.0	5.7	3.1	2.4	3.5	5.8	2.9	4.2	2.5	1.7	2.1	2.0	1.9	1.2	1.0	1.0	0.7	0.4	0.0	0.5	0.2	++
LIBERIA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.2	0.4	0.4	0.4	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2

SMT-Table 1. Continued

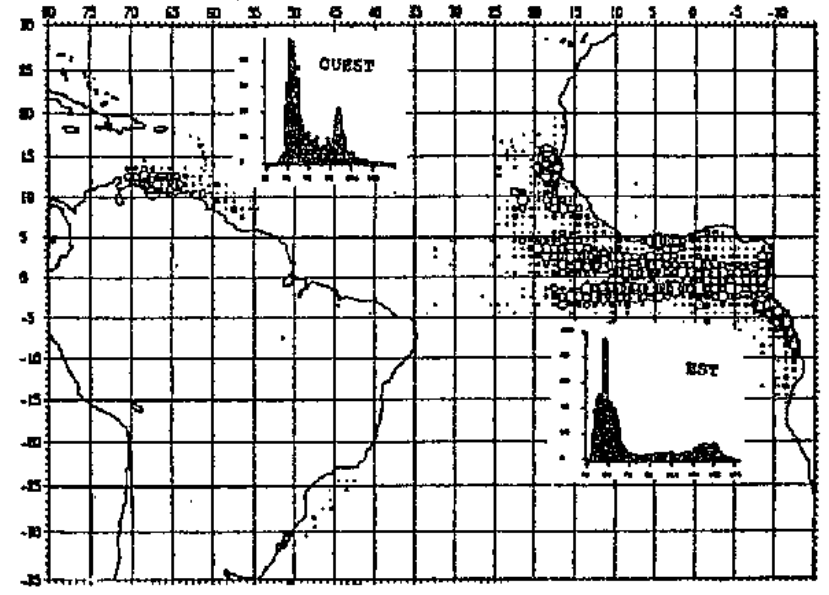
	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
PANAMA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.8	1.4	2.6	0.8	0.2	0.7	1.1	0.6	0.7	0.0	0.4	0.4	0.4	0.0	0.0	- 0.0	0.0
PORTUGAL	0.8	0.7	0.8	0.4	0.1	0.1	0.3	0.5	0.3	0.5	0.2	++	++	0.2	0.3	0.3	0.5	0.2	0.2	0.2	0.1	0.0	0.0	++	0.4	0.0	++	0.0	0.0	0.0
SILEONE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	++	0.0	0.5	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.1	0.1
ESPANA	0.2	0.1	0.0	0.0	0.0	1.0	0.8	0.7	0.1	0.0	6.6	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	++	++
TOGO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.5	0.5	0.6	0.6	0.8	0.7	0.5	0.5	++	0.4	0.3	0.4	0.3	0.1	0.3	0.1	0.2	0.4	0.3	0.2	0.2
USA	0.0	++	0.1	0.1	++	++	++	++	0.0	0.1	0.0	0.0	++	++	++	0.1	++	++	0.5	0.1	0.2	0.4	0.9	0.2	0.3	0.3	0.1	0.1	0.2	0.1
USSR	0.0	0.0	0.0	0.2	0.2	0.0	++	0.2	0.3	0.3	0.2	0.2	0.3	0.4	++	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VENEZUEL	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.2	0.8	0.0	0.0	++	0.7	0.0	0.1	++	0.0	0.0	0.0	0.9	0.9	0.4	0.4	++	0.0	0.0	0.0	0.2
OTHERS	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.4	0.5	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.4	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.6

++.0 CATCHES: < 50 MT AND >= 1 MT

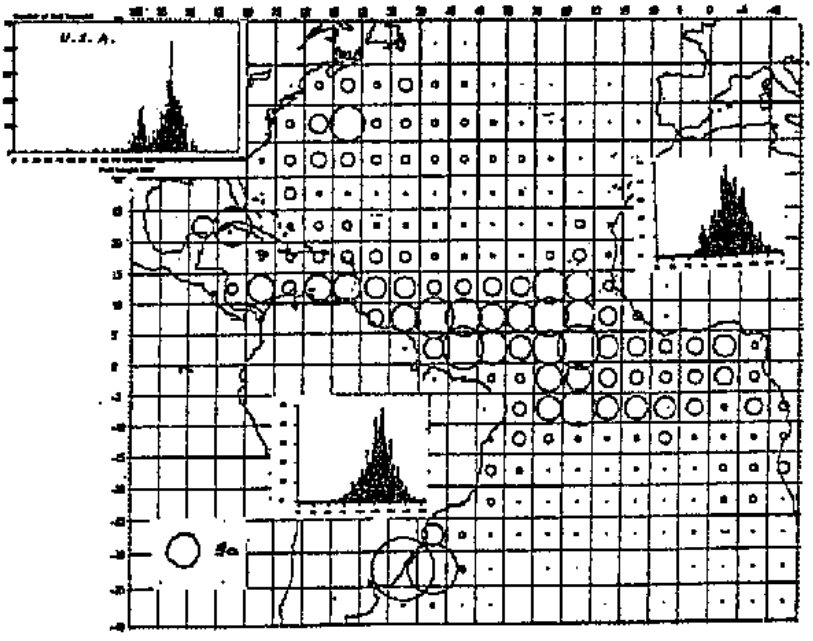
* INCLUDES FRIGATE TUNA FOR COTE D'IVOIRE
** INCLUDES BULLET TUNA (A. ROCHEI)
& INCLUDES ATL. BLACK SKIPJACK FOR ATLANTIC PS ESPANA BEGINNING IN 1978
*** INCLUDES SERRA SPANISH MACKEREL (S. BRASILIENSIS)



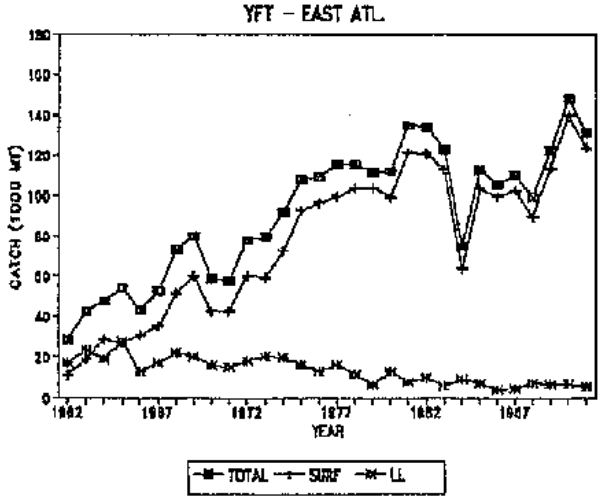
YFT-Fig. 1.
Distribution of the catches of all the baitboats operating in the Atlantic (average of the 1983-1986 period) and distribution of the average sizes of the individuals caught in each area (Coll. Vol. Sci. Pap. XXXVI).



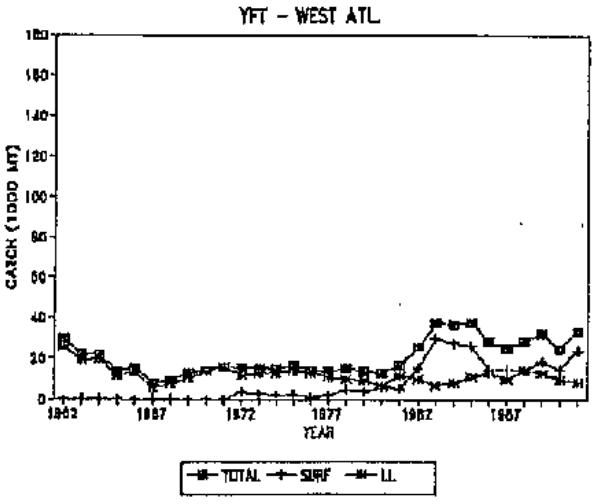
YFT-Fig. 2.
Location of fishing areas of all purse seiners operating in the Atlantic (average of the 1983-1986 period) and average size distribution of individuals caught in each area (Coll. Vol. Sci. Pap. XXXVI)



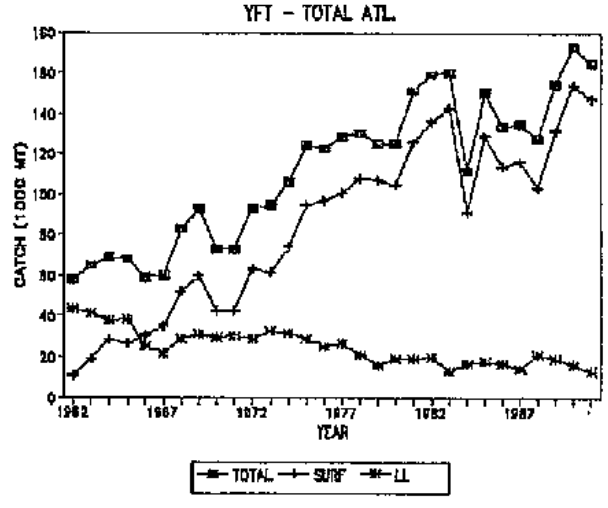
YFT-Fig. 3.
Distribution of the Atlantic yellowfin catches of the longline fisheries and the average size distribution of yellowfin for the east and west Atlantic, for the period 1983-86. The size distribution of the U.S. longline fishery corresponds to 1987.



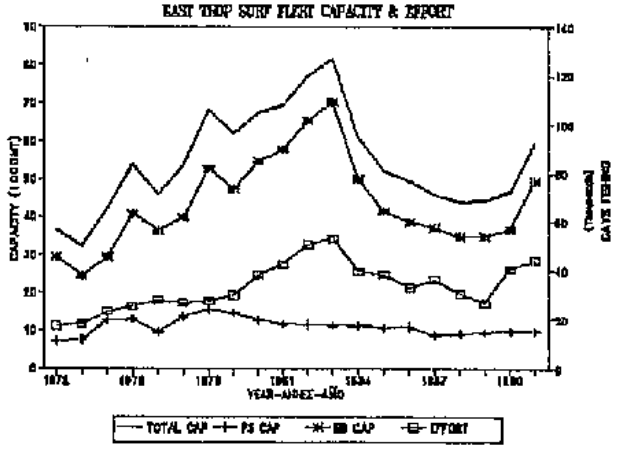
YFT-Fig. 4. Surface (SURF), longline (LL) and total (TOTAL) catches of yellowfin tuna in the eastern Atlantic.



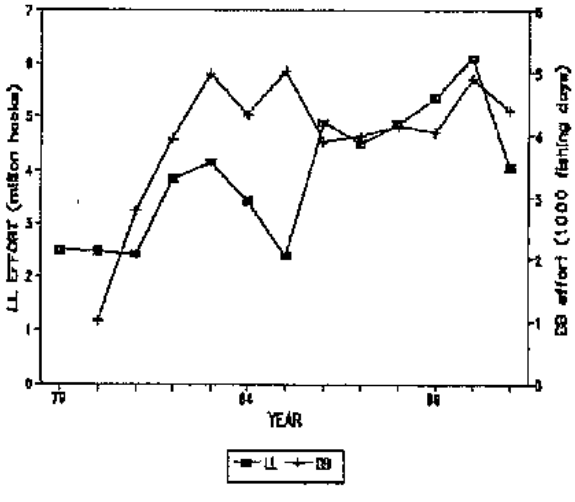
YFT-Fig. 5 Changes in surface (SURF), longline (LL) and total (TOTAL) catches of yellowfin in the western Atlantic.



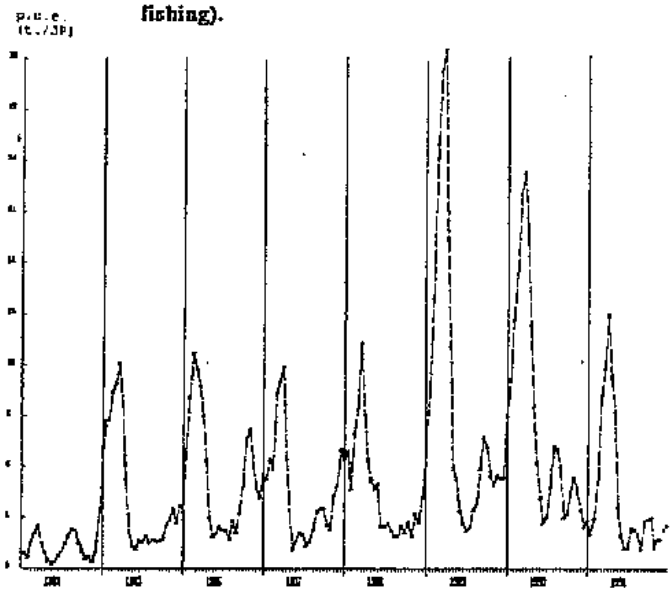
YFT-Fig. 6. Changes in surface longline (LL) and total (TOTAL) catches of yellowfin tuna for the entire Atlantic.



YFT-Fig. 7 Carrying capacity (in thousand MT) of east tropical surface fleet and yellowfin fishing effort (days fishing).



YFT-Fig. 8. Brazilian longline and baitboat fishing effort, 1979-1991.



YFT-Fig. 9. CPUE (weight) by bi-weekly period of purse seine (all countries) for large yellowfin (>30 kg), 1984-1991.

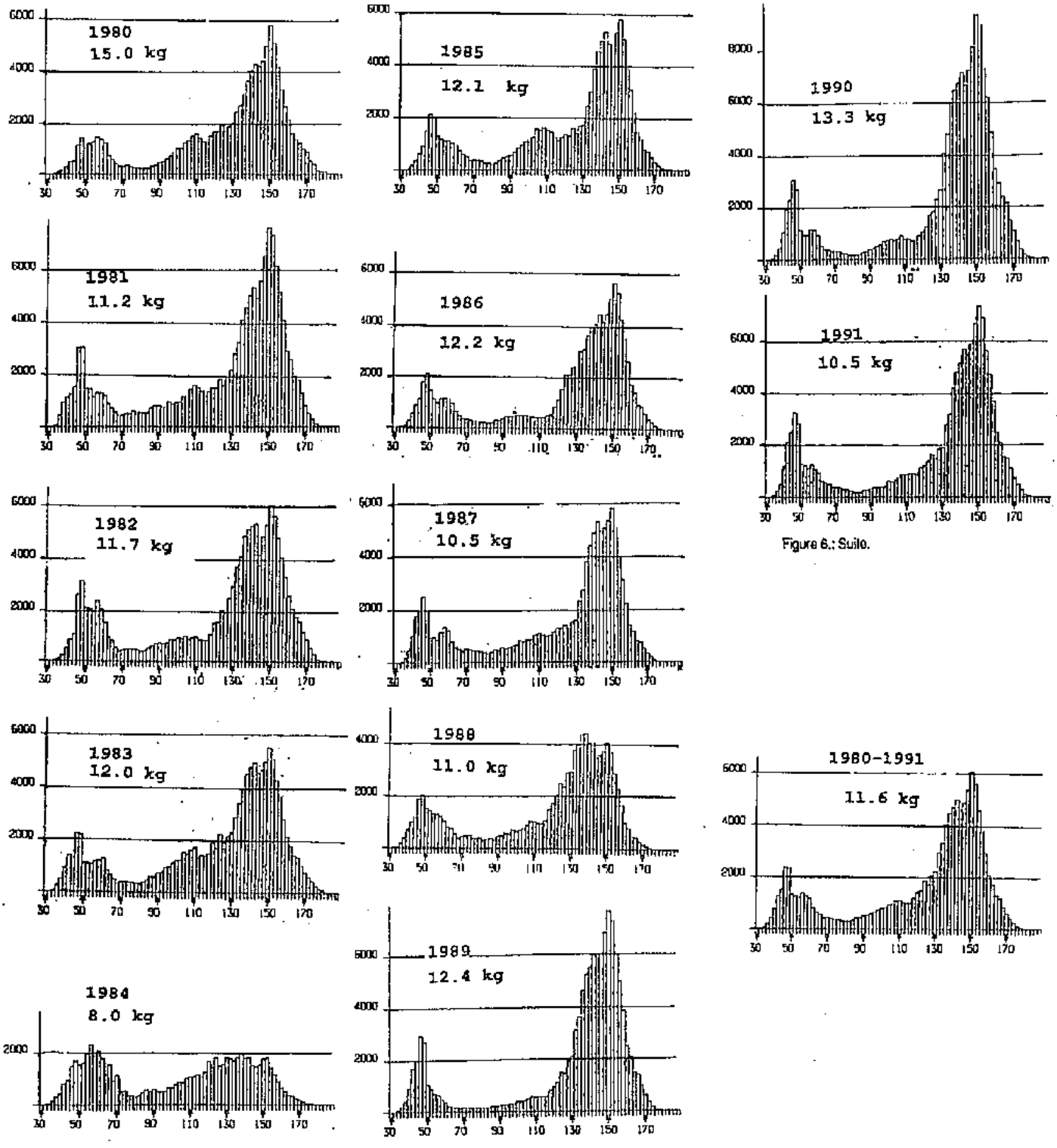
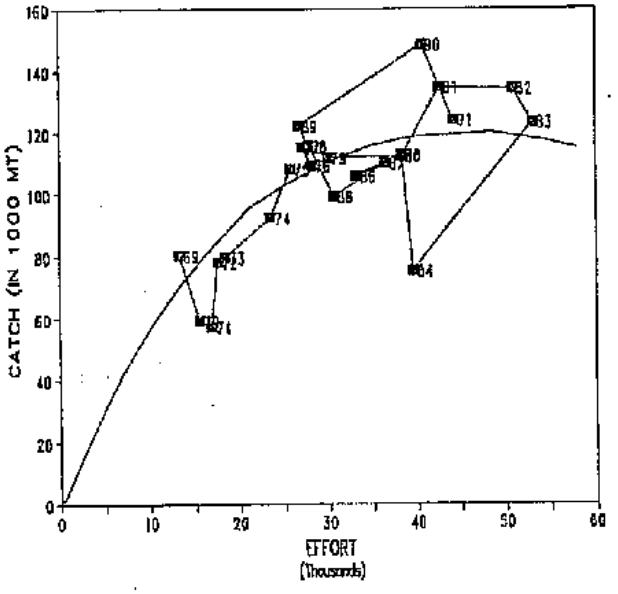
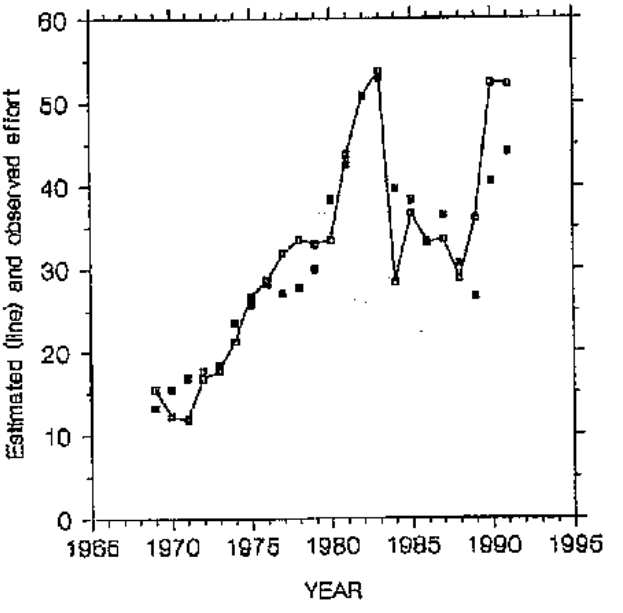


Figure 6.: Suite.

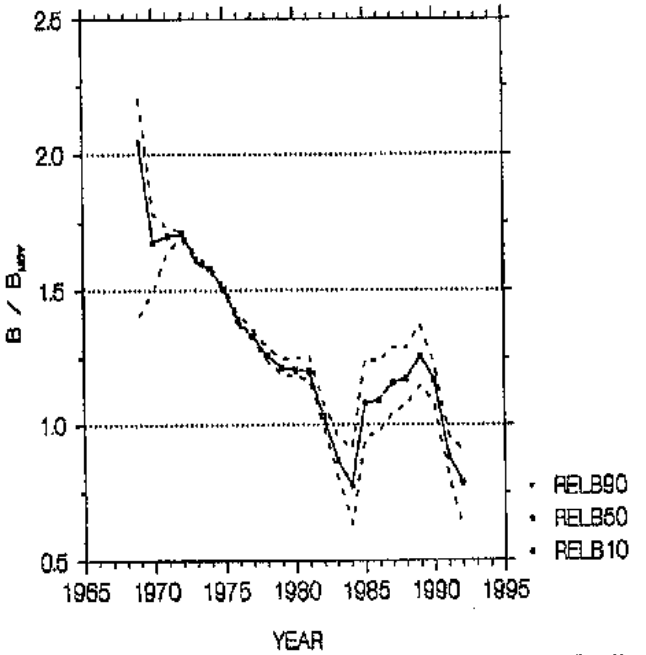
YFT-Fig. 10. Total annual catch (MT) at size of 2 cm intervals of east Atlantic yellowfin tuna.



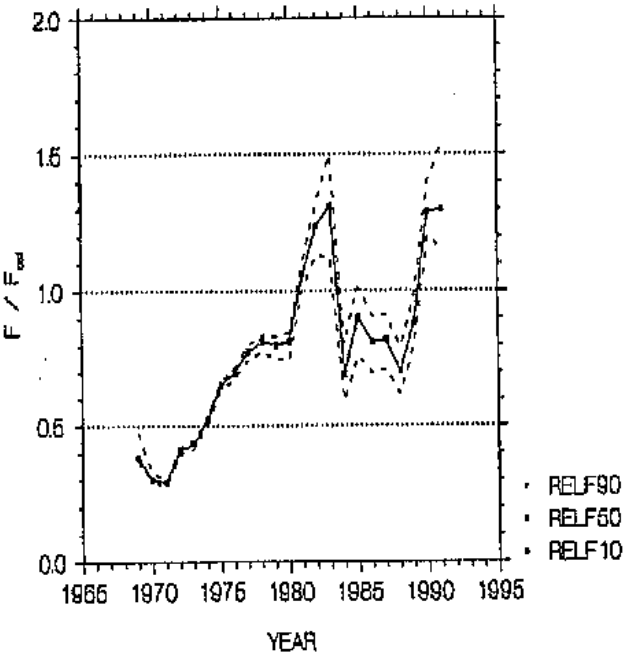
YFT-Fig. 11. Equilibrium production model of yellowfin tuna in the east Atlantic (m=2, K=4). Nominal catch (in 1000 MT) and nominal effort (in fishing days) standardized to FIS purse seine of class 5, assuming an annual increase of 3 percent in fishing efficiency since 1980.



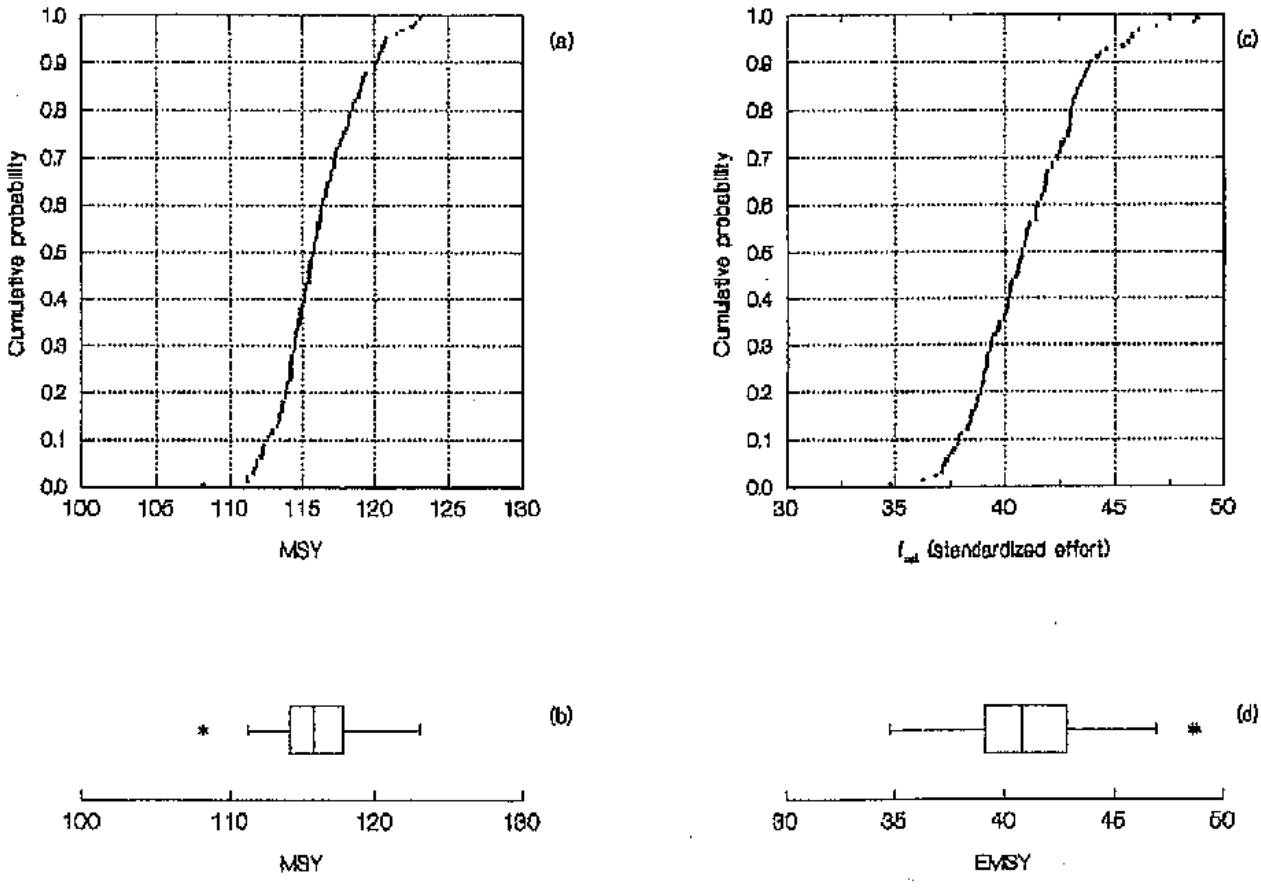
YFT-Fig. 12. Non-equilibrium ASPIC production model of yellowfin tuna in the east Atlantic. Estimated (line, open squares) and observed (filled squares) annual fishing effort rates. Observed values are from YFT-Table 3.



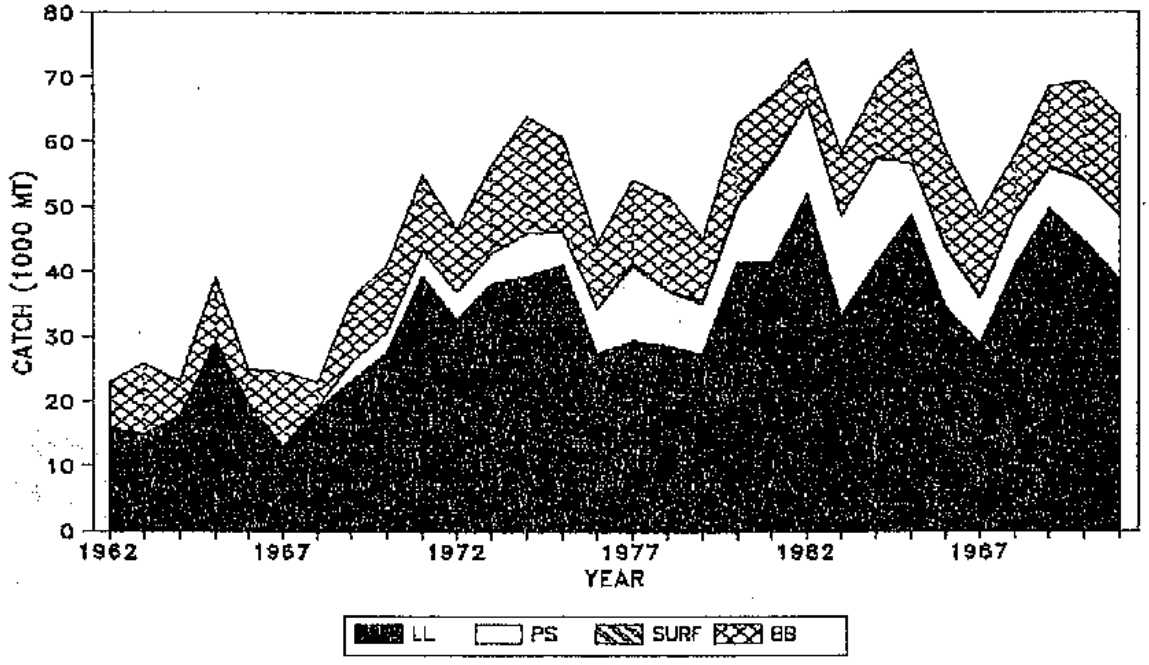
YFT-Fig. 13. Non-equilibrium ASPIC production model of yellowfin tuna in the east Atlantic. Approximate 80 percent confidence interval (with median) of the estimated start-of-year stock biomass relative to optimum biomass B_{MSY}. Each point represents the median (or respective percentile) for that year from 120 bootstrap trials. They are joined to produce a synthetic median (or percentile) trajectory.



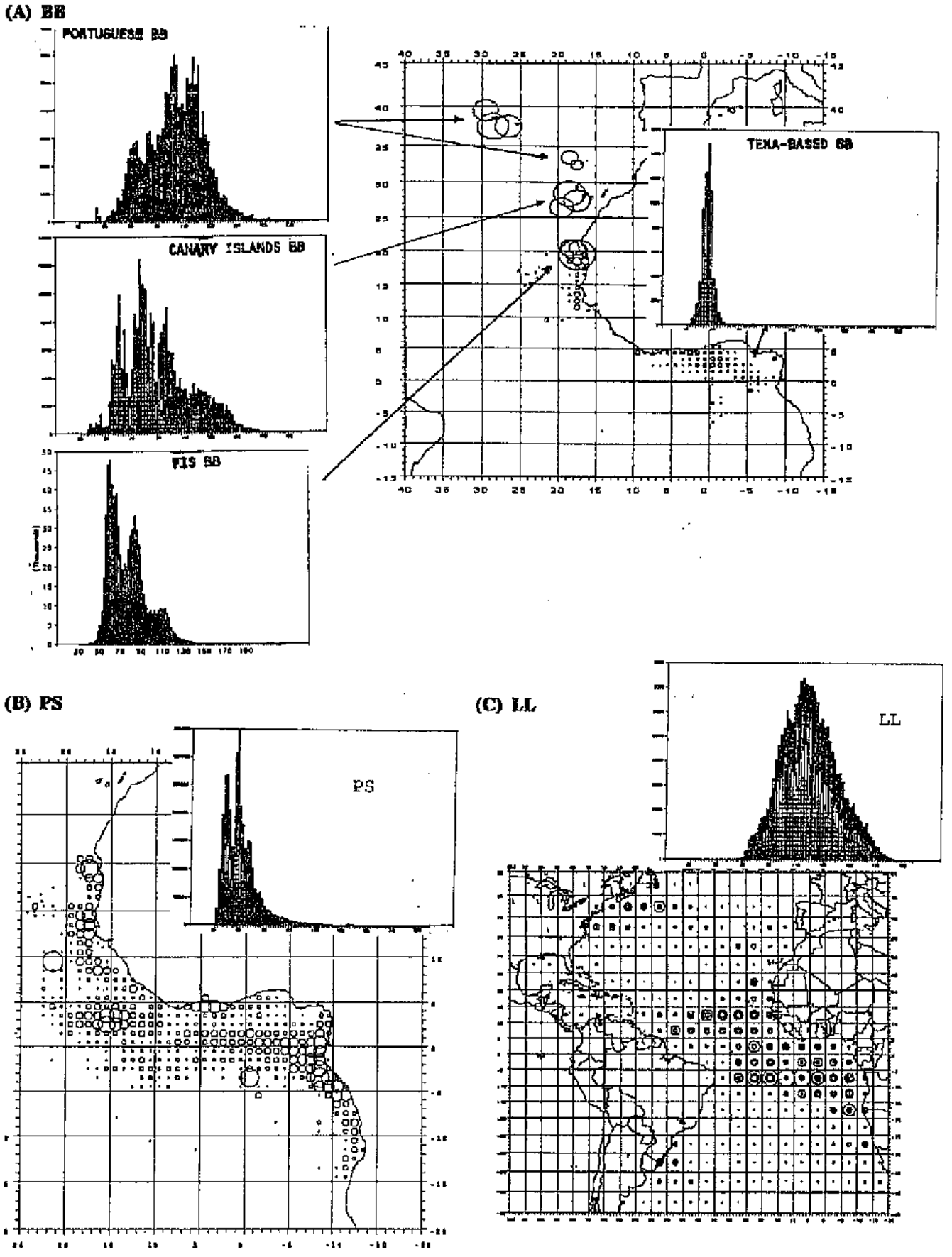
YFT-Fig. 14. Non-equilibrium production model of yellowfin tuna in the east Atlantic. Approximate 80 percent confidence interval (with median) of the estimated annual fishing mortality rate relative to optimum mortality rate F_{opt}. Each point represents the median (or respective percentile) for that year from 120 bootstrap trials. They are joined to produce a synthetic median (or percentile) trajectory.



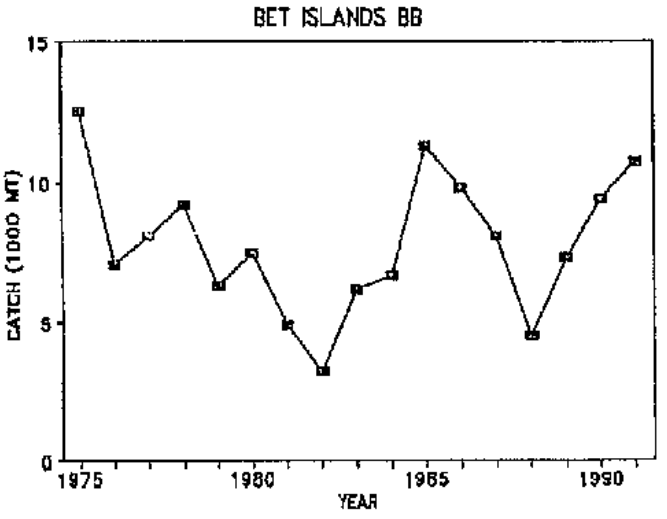
YFT-Fig. 15. Distributions of MSY and optimum effort f_{MSY} for yellowfin tuna in the east Atlantic. Results are from a bootstrapped production model analysis with 120 realizations. Panel (a), cumulative distribution of MSY. Panel (b), distribution (density) of estimates of MSY. Panel (c), cumulative distribution of f_{opt}; panel (d) distribution (density) of estimates of f_{opt}.

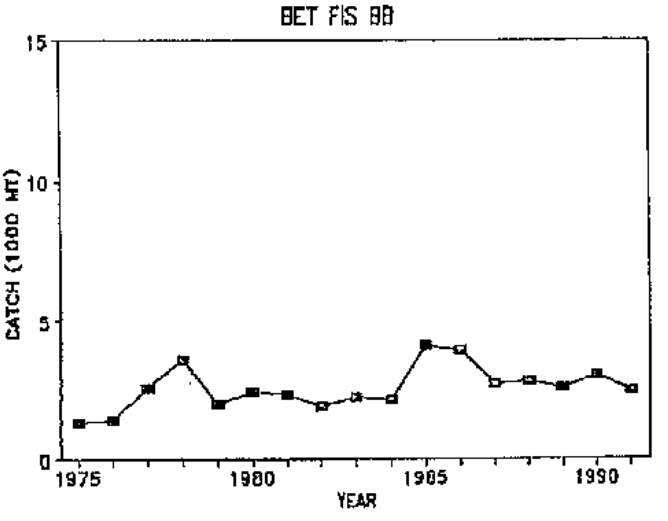


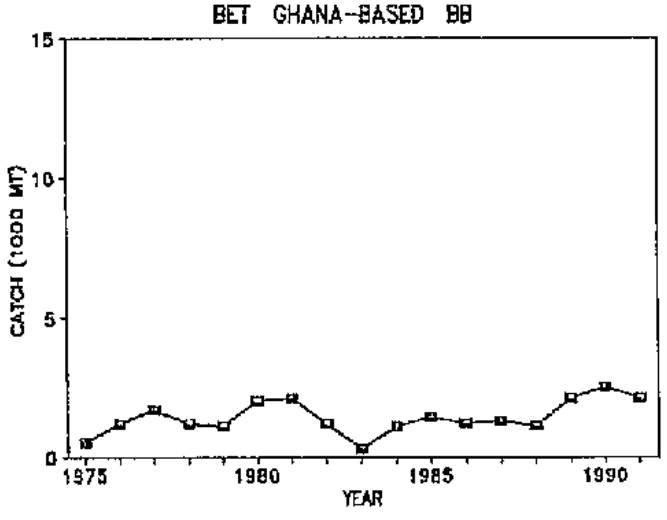
BET-Fig. 1. Total bigeye catches (in 1000 MT) in the entire Atlantic, by major fishing gears.

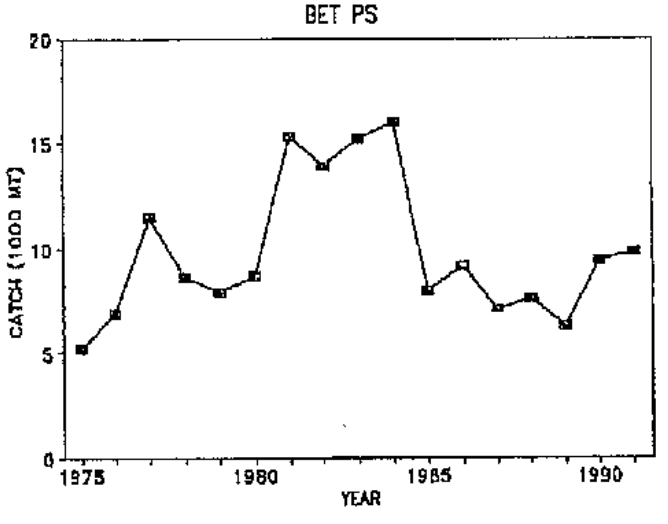


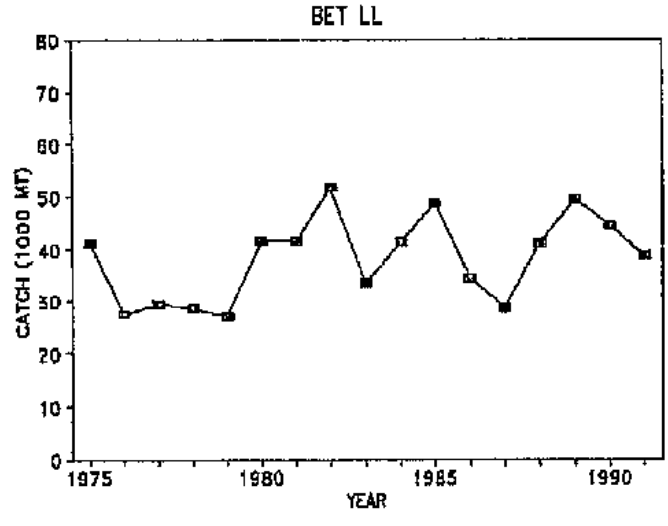
BET-Fig. 2. Areas of operation and size frequencies of the main bigeye fisheries in the Atlantic. (A) Baitboat, (B) Purse seine, (C) Longline.



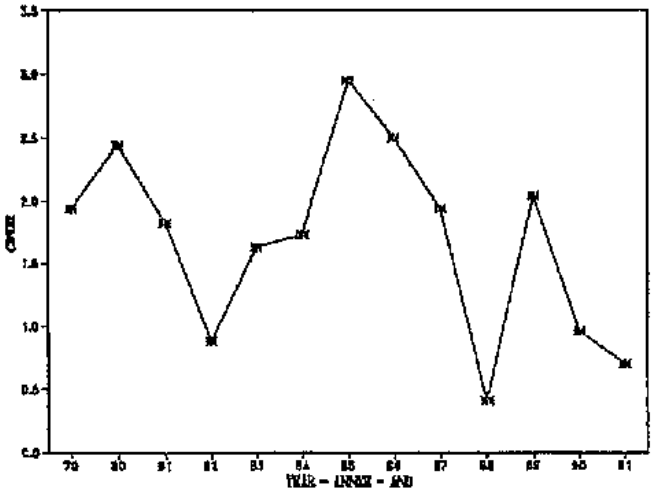




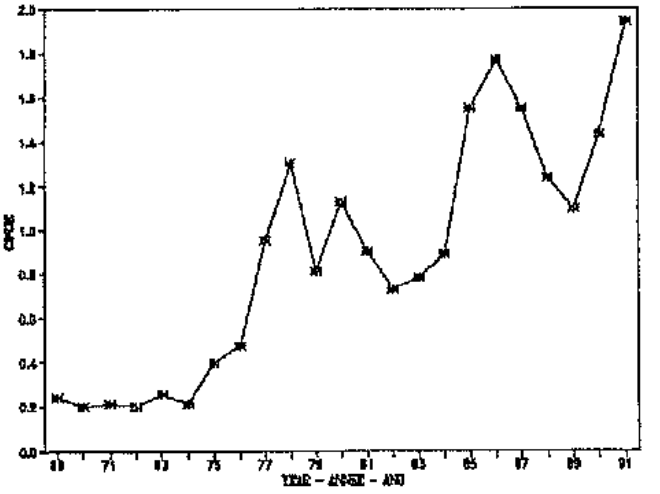




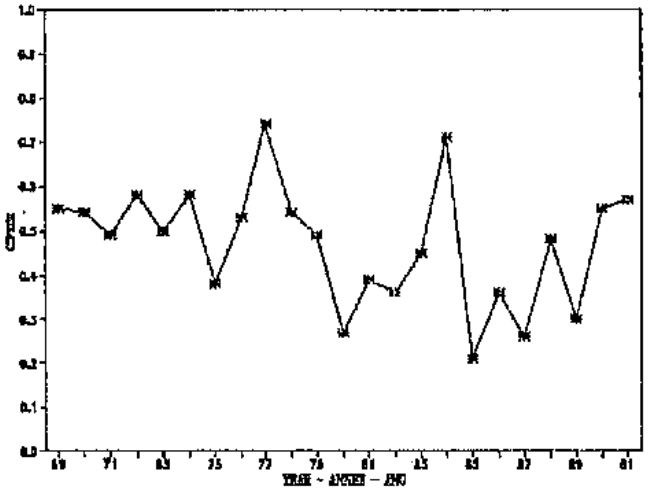
BET-Fig 3. Annual catches of bigeye tuna by major fisheries.



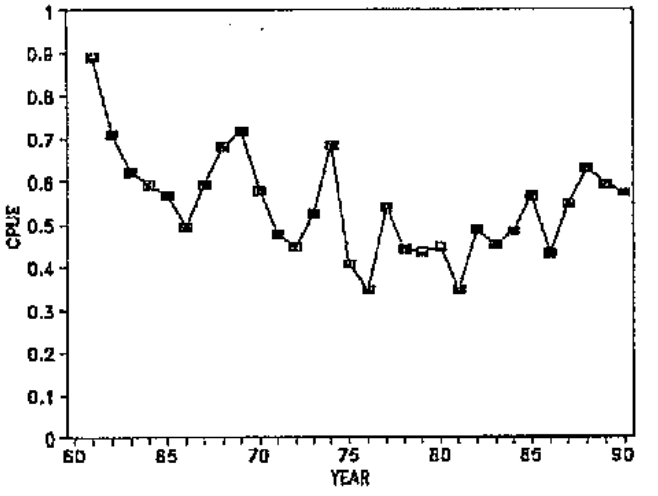
BFT-Fig. 4. Bigeye CPUE trends for Azorean baitboats (II quarter), from 1979 to 1991 (SCRS/92/161).



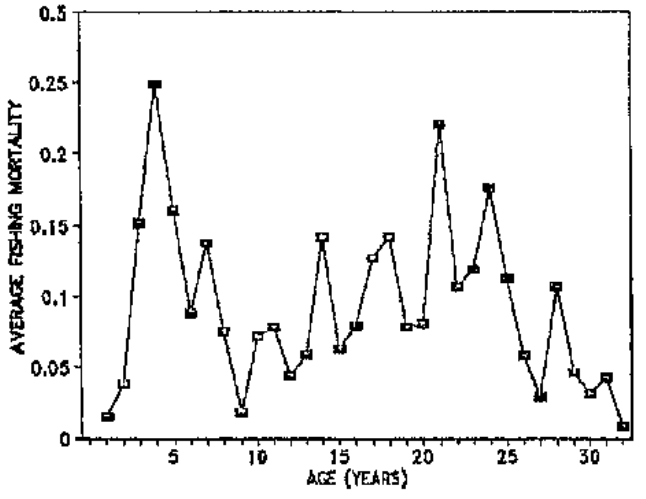
BFT-Fig. 5. Bigeye CPUE trends for Dakar-based baitboats, from 1979 to 1991 (SCRS/92/155).



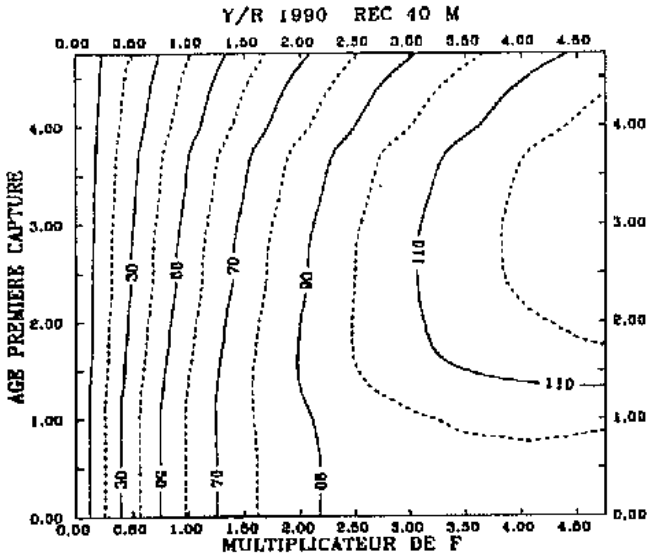
BFT-Fig. 6. Bigeye CPUE trends for FIS purse seiners, from 1979 to 1991 (SCRS/92/155).



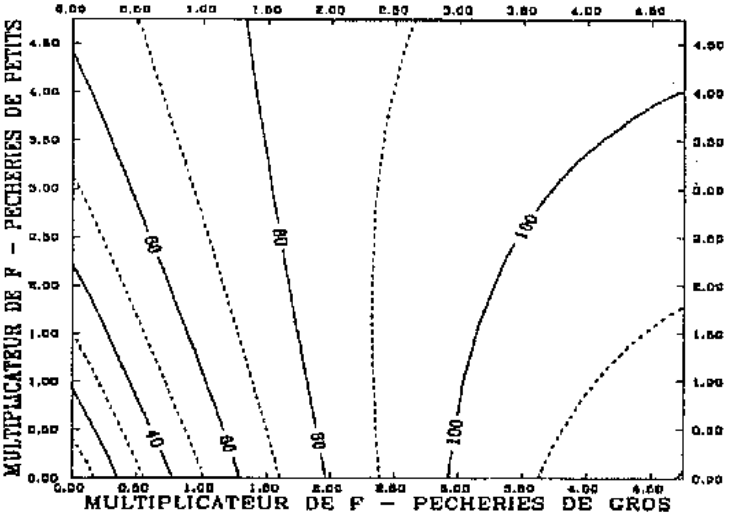
BFT-Fig. 7. Bigeye CPUE trends for Japanese longliners, from 1961 to 1990 (SCRS/92/159).



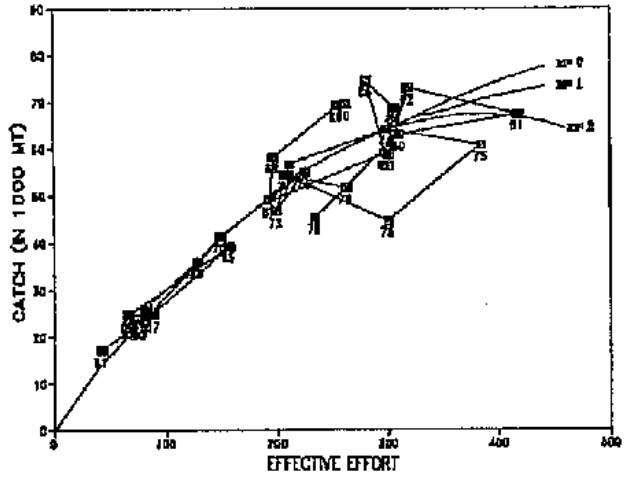
BFT-Fig. 8. Fishing mortalities by quarterly ages, calculated by cohort analysis, for fishing year 1990, all gears combined (SCRS/92/160).



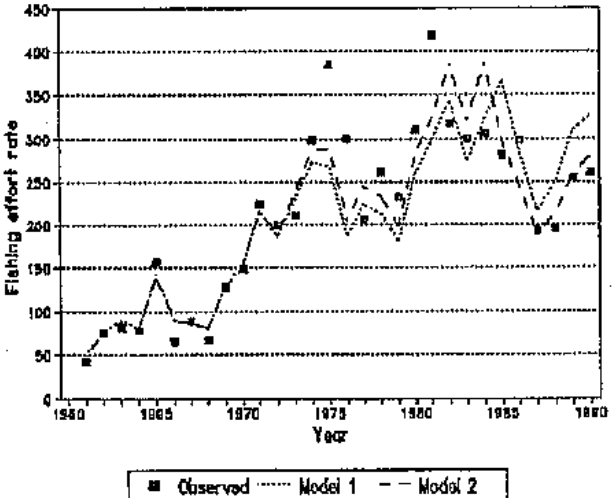
BET-Fig. 9. Yield per recruit curves (Ricker model). Yield estimated for the Atlantic bigeye tuna fishery, fishing year 1990 (SCRS/92/160).



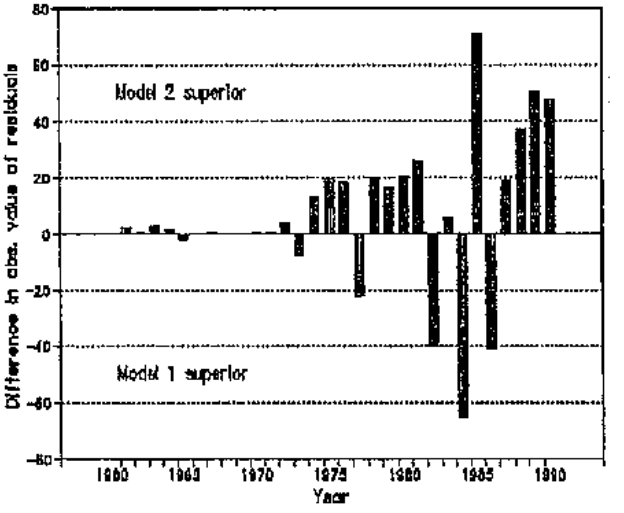
BET-Fig. 10. Multi-gear yield per recruit curves, Atlantic bigeye tuna, fishing year 1990 (SCRS/92/160).



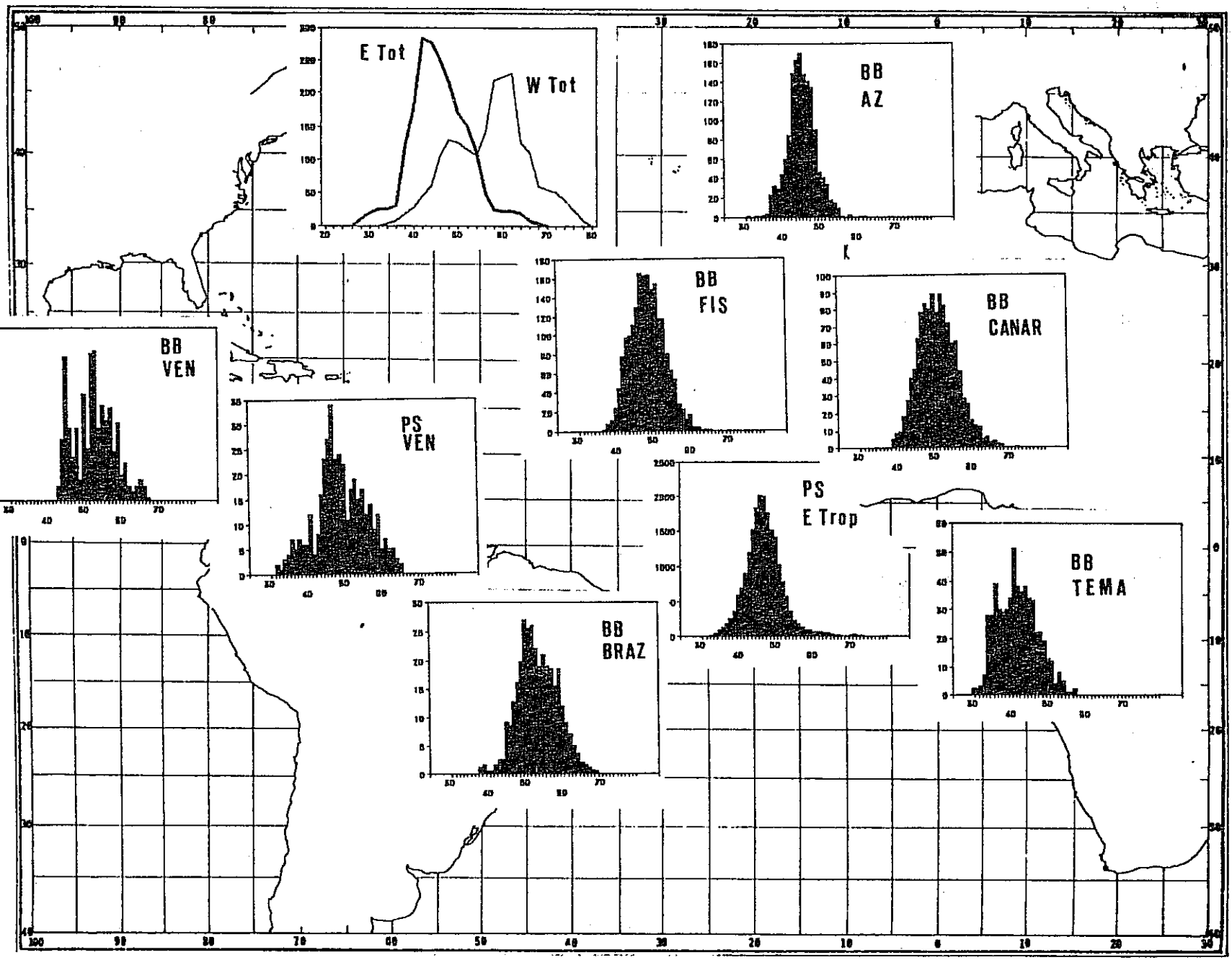
BET-Fig. 11. Yield curves from production model analysis (PRODFIT) on bigeye tuna, for the entire Atlantic (SCRS/92/159).



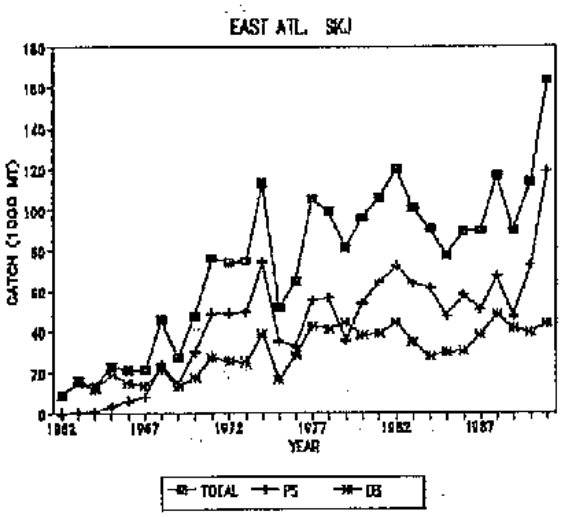
BET-Fig. 12. Non-equilibrium production model of bigeye tuna in the eastern Atlantic. Fit of two models: Model 1 assumes that catchability is constant for the entire period. Model 2 assumes that catchability is constant within each of two periods, 1961-1984 and 1985-1990. Each model fits the data reasonably well, with Model 2 fitting better.



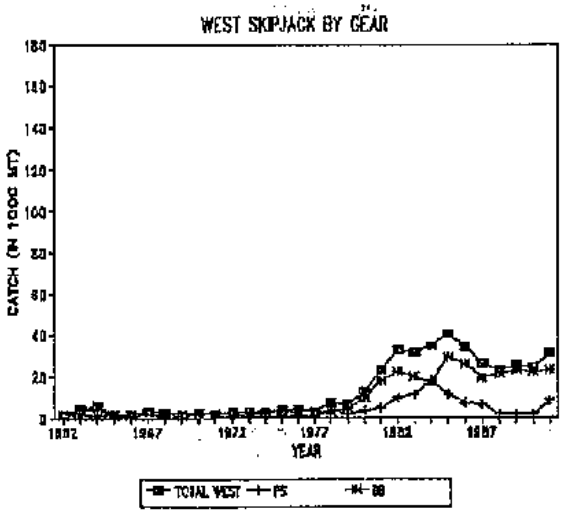
BET-Fig. 13. Illustration of fit of two models. Bars represent the difference in absolute values of residuals between the two models. Positive numbers indicate years in which Model 2 fits the data better.



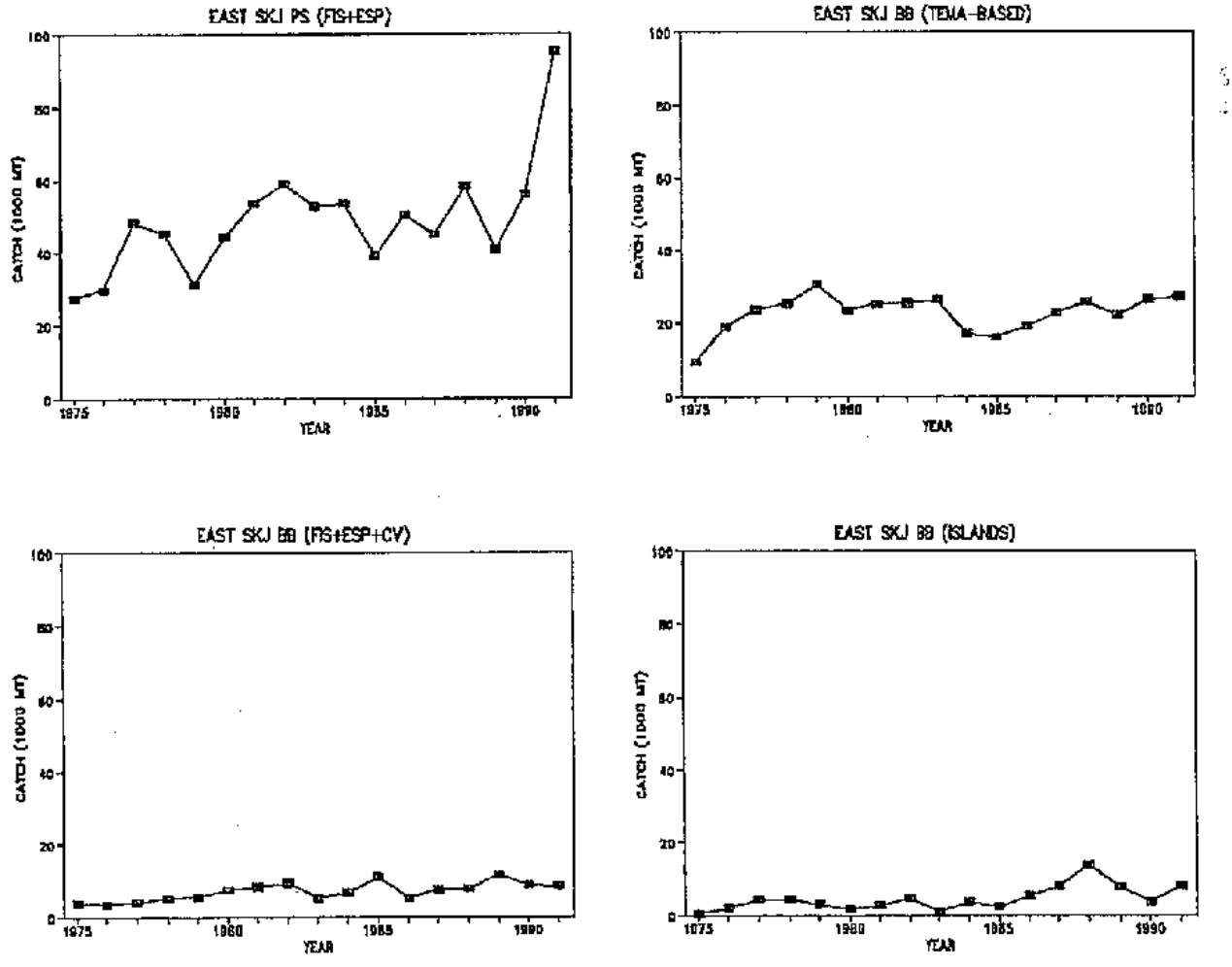
SKJ-Fig. 1. Size distribution of skipjack catches by the principal Atlantic fisheries.



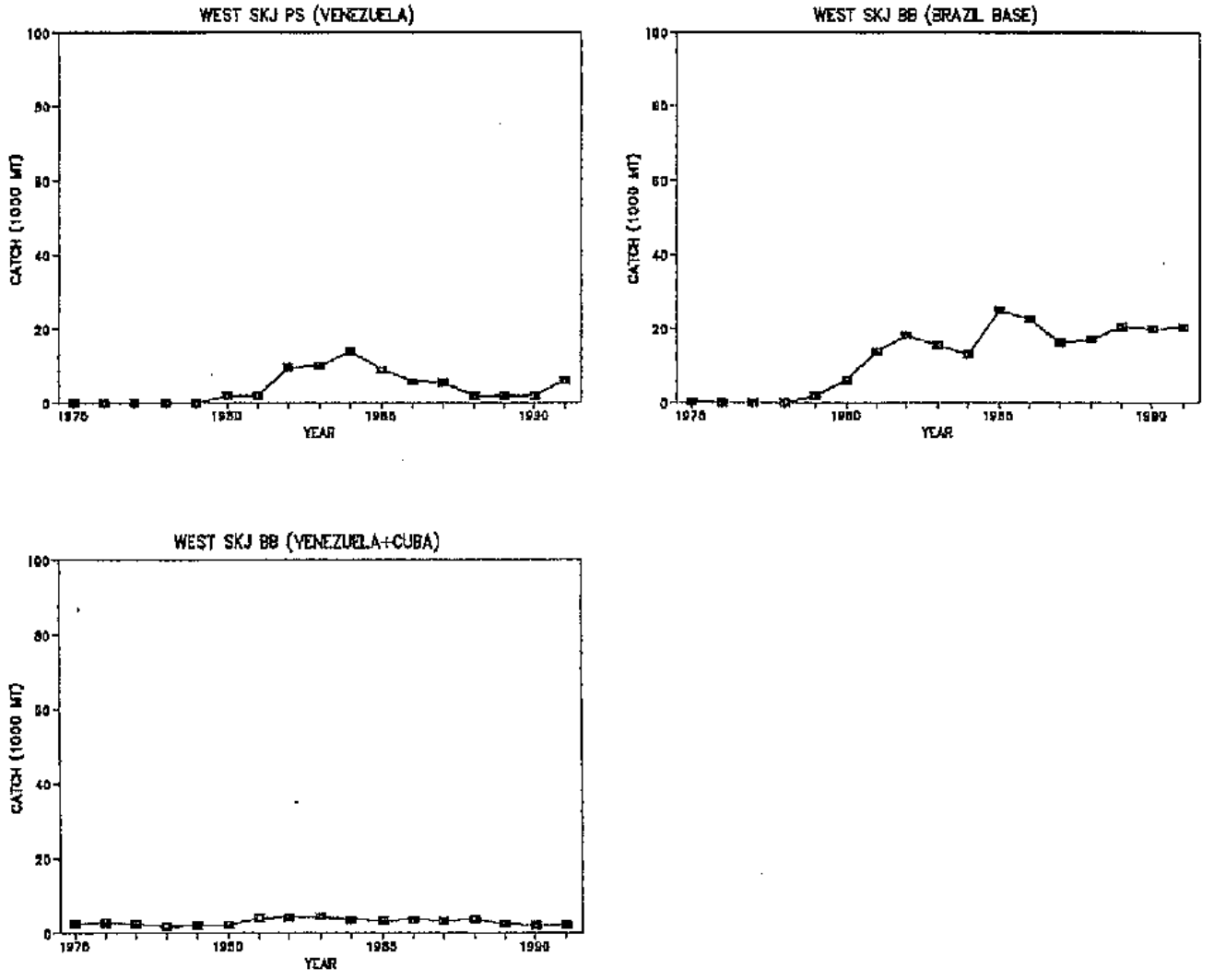
SKJ-Fig.2. Skipjack catches in the east Atlantic, by gear and by total.



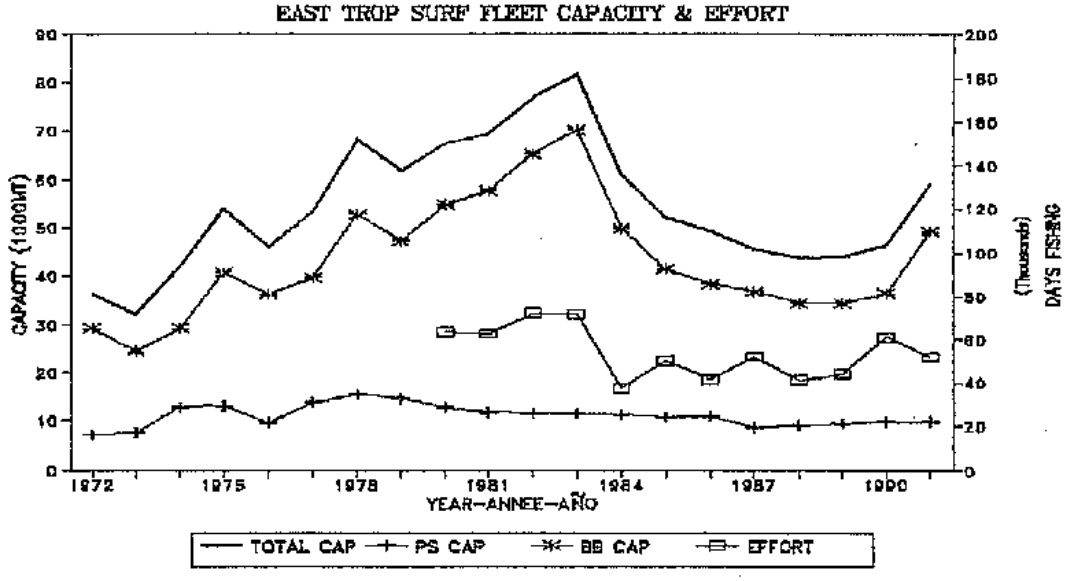
SKJ-Fig. 3. Skipjack catches in the west Atlantic, by gear and by total.



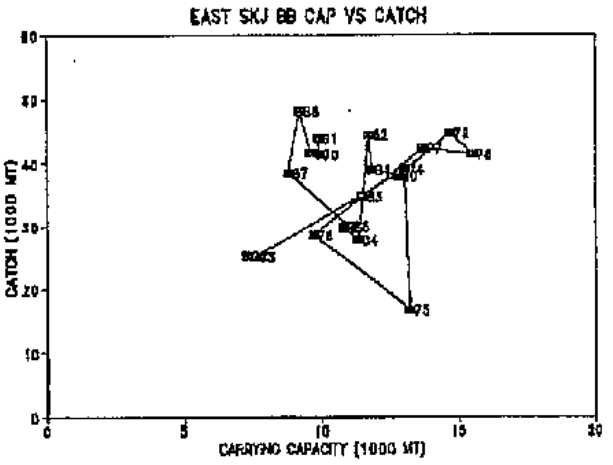
SKJ-Fig. 4. Annual catches by the principal skipjack fisheries in the east Atlantic, 1975-1991.



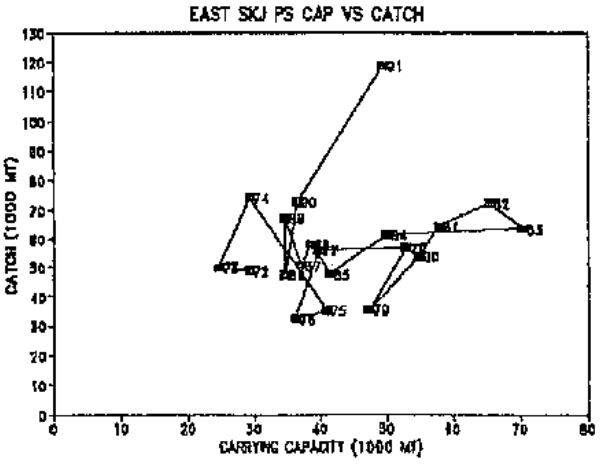
SKJ-Fig. 5. Annual catches by the principal skipjack fisheries in the west Atlantic, 1975-1991.



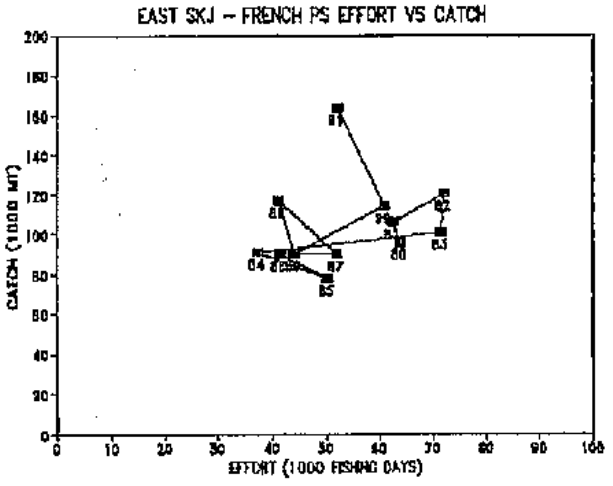
SKJ-Fig. 6. Change in vessel carrying capacity of purse seine, baitboat and total fleets in the eastern Atlantic, from 1972 to 1991. Change in skipjack effort, in days fishing, from 1980 to 1991.



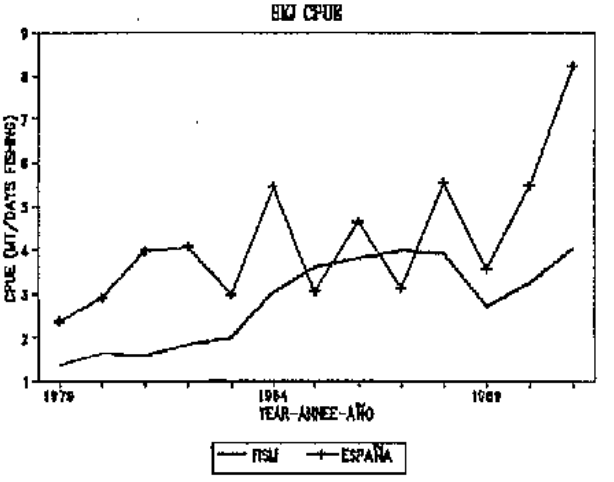
SKJ-Fig. 7. Skipjack catches plotted against carrying capacity of the east Atlantic baitboat fleet.



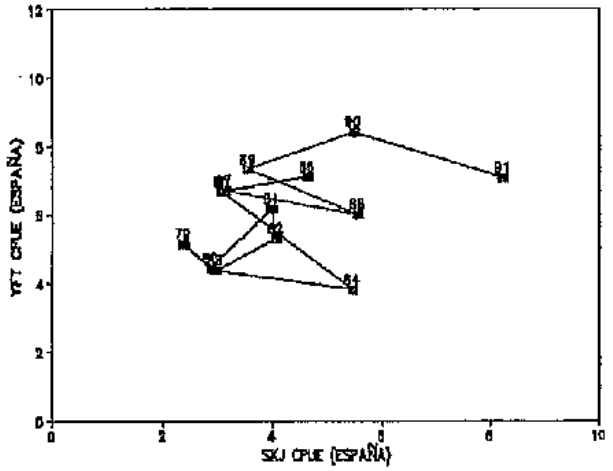
SKJ-Fig. 8. Skipjack catches plotted against carrying capacity of the east Atlantic purse seine fleet.



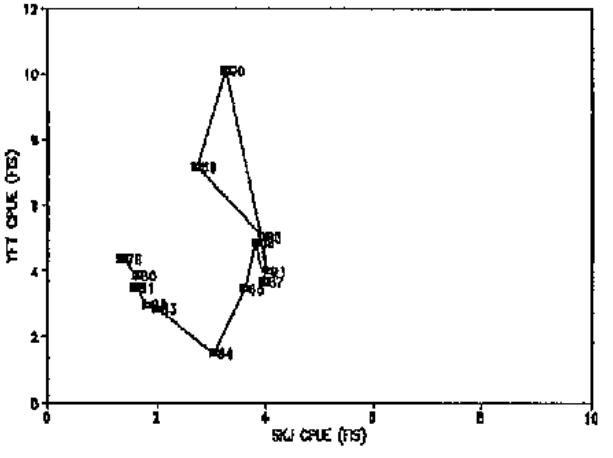
SKJ-Fig. 9. Changes in skipjack catches plotted against estimated FISM purse seine effort (adjusted by a factor of efficiency of 3 percent annually) for the 1980 to 1991 period.



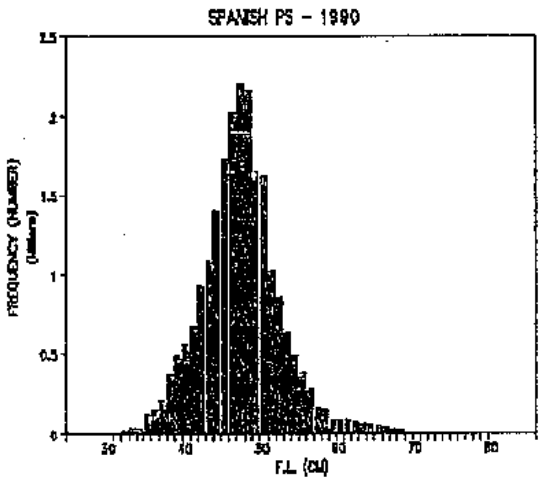
SKJ-Fig. 10. Annual CPUE (MT/fishing days) of the FISM and Spanish purse seine fleets in the east Atlantic, 1979-1991.



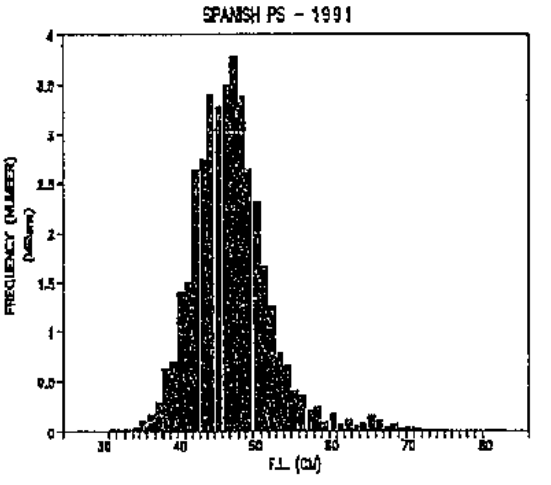
SKJ-Fig. 11. Yellowfin CPUE (MT/days fishing) plotted against skipjack CPUE by the Spanish fleet.



SKJ-Fig. 12. Yellowfin CPUE (MT/days fishing) plotted against skipjack CPUE by the FISM fleet.



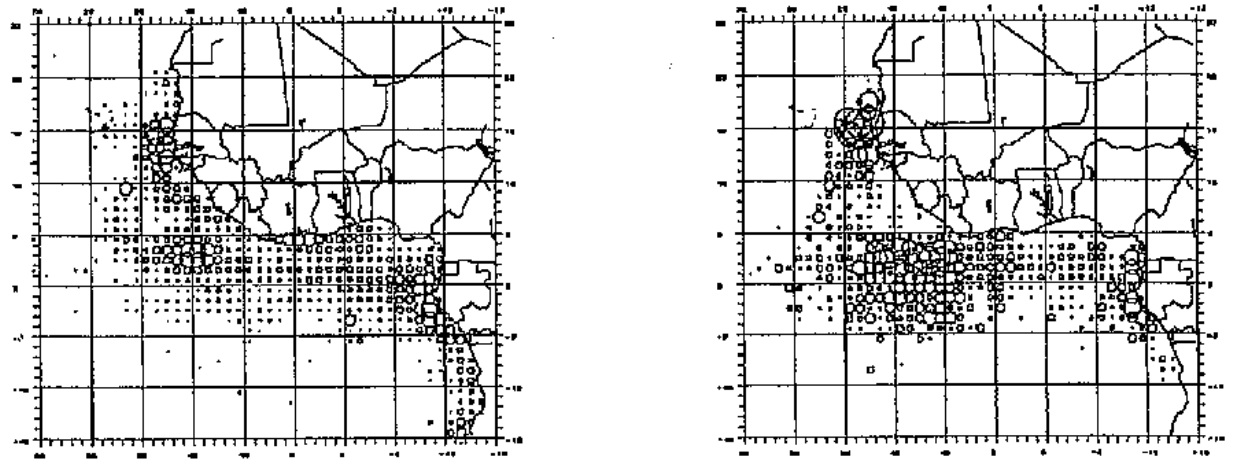
SKJ-Fig. 13. Size distribution of skipjack catches taken by the Spanish purse seine fleet in the east Atlantic in 1990.



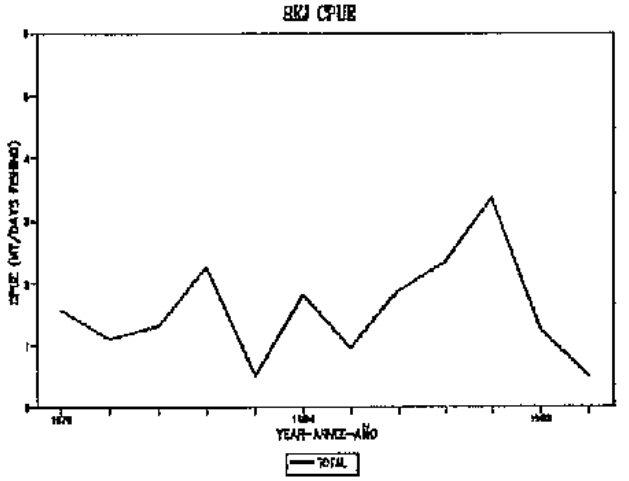
SKJ-Fig. 14. Size distribution of skipjack catches taken by the Spanish purse seine fleet in the east Atlantic in 1991.

1980-1987

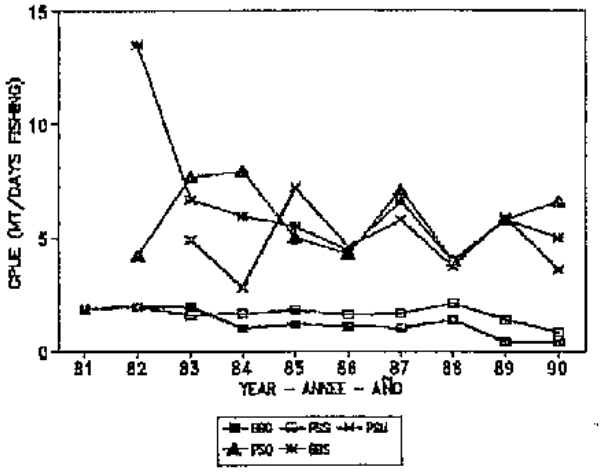
1991



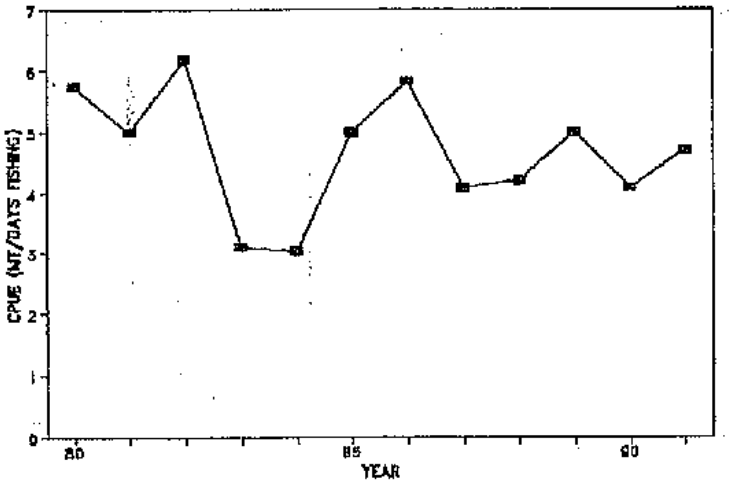
SKJ-Fig. 15. Maps showing skipjack catches in the Atlantic by the Spanish and FIS purse seine fleets. The left panel is for the period 1980-1987 and the right panel is for 1991.



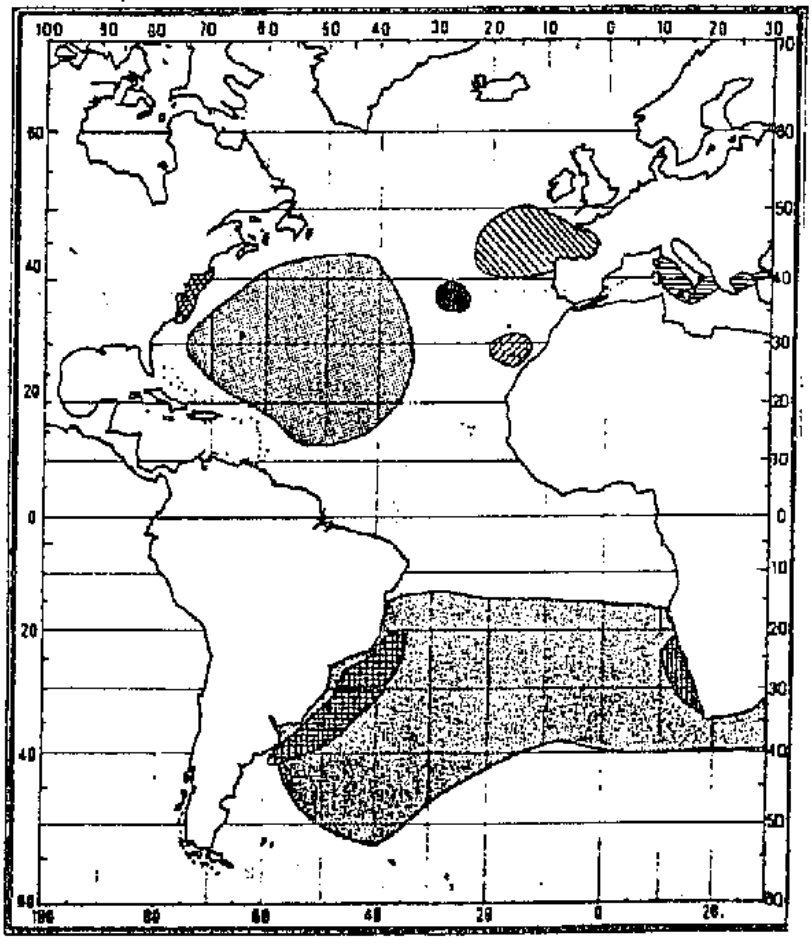
SKJ-Fig. 16. CPUE (MT/fishing days) of the Azorean baitboat fleet during the third quarter of the year, 1979-1990.



SKJ-Fig.17. Skipjack CPUE for the different Venezuelan fleets, 1981-1990.



SKJ-Fig. 18 Changes in CPUE of the Brazilian baitboat fishery, in MT/days fishing.



BB, TROL, GILL, MWTD (summer - autumn)

BB (autumn)

BB (winter - spring)

LL

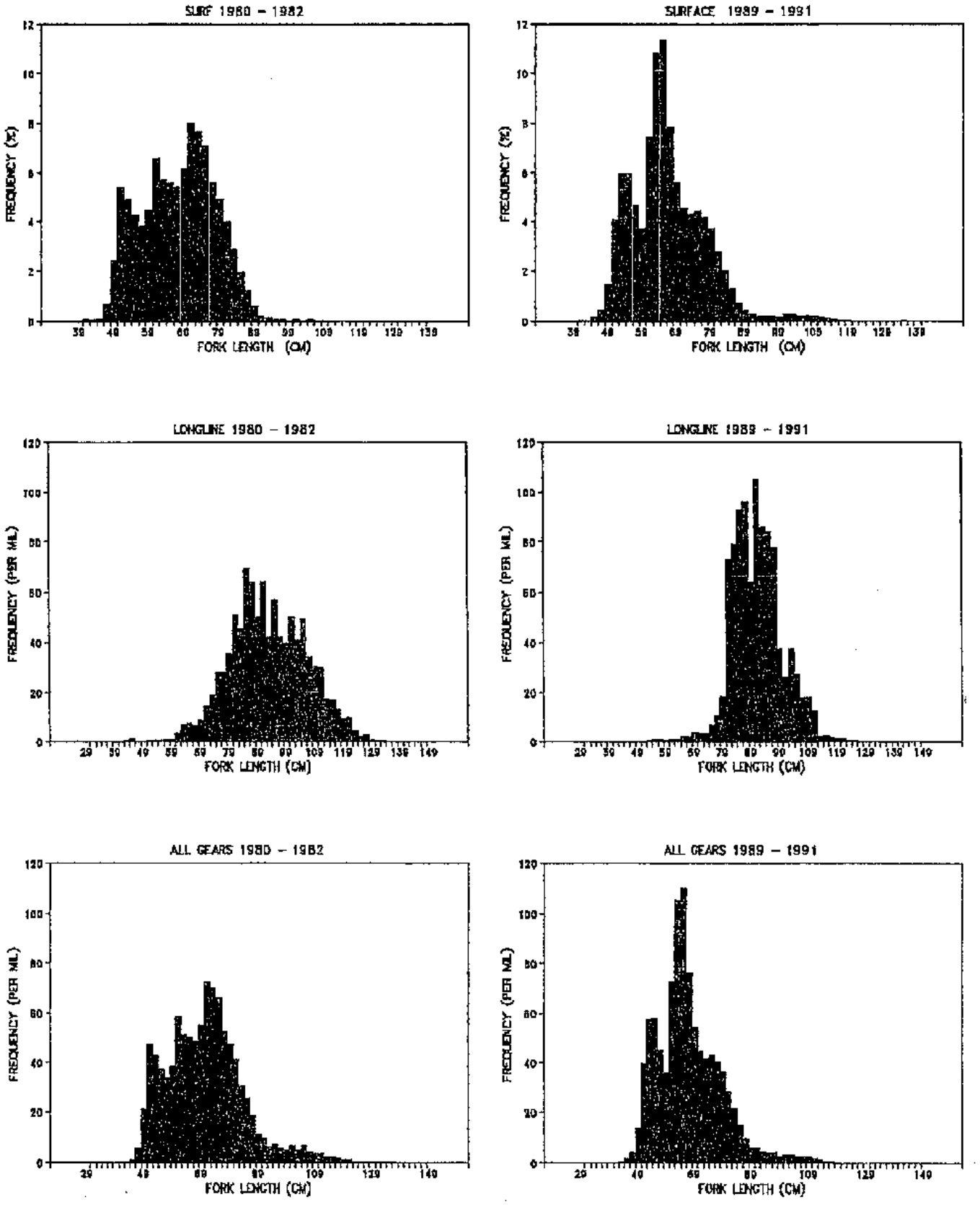
LL (coastal)

SPORT (Coastal)

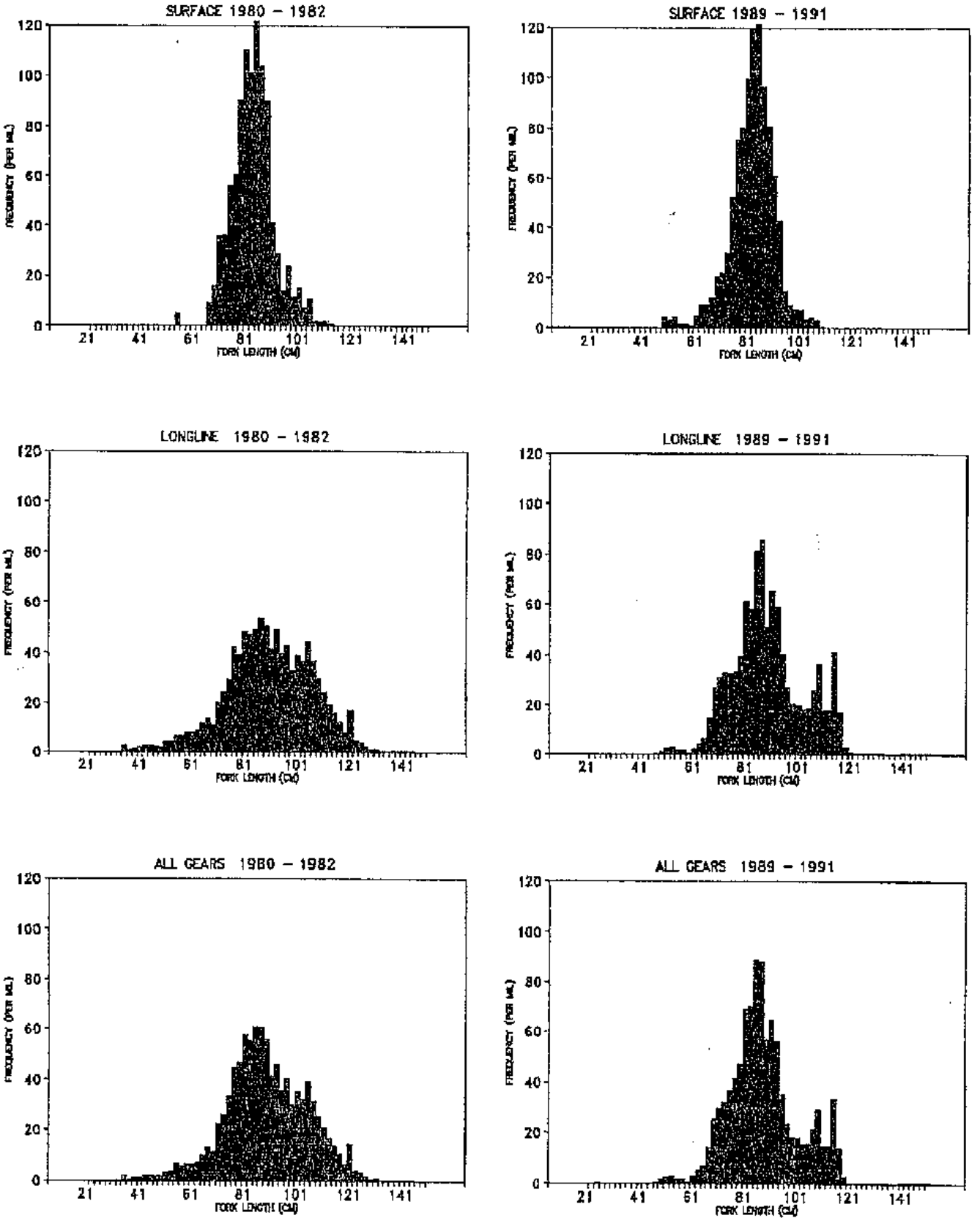
BB (South African - seasonal)

UNCL (Mediterranean)

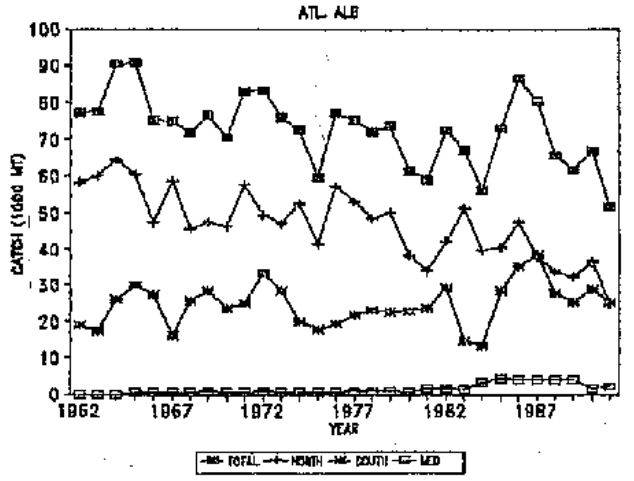
ALB-Fig. 1. Distribution of albacore fisheries in the Atlantic.



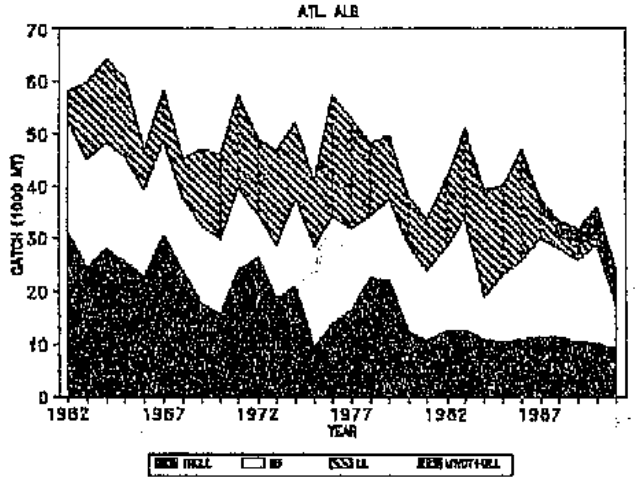
ALB-Fig. 2. Comparison of north Atlantic albacore catch at size for two periods (1980-1982 vs 1989-1991), for surface, longline, and all gears combined.



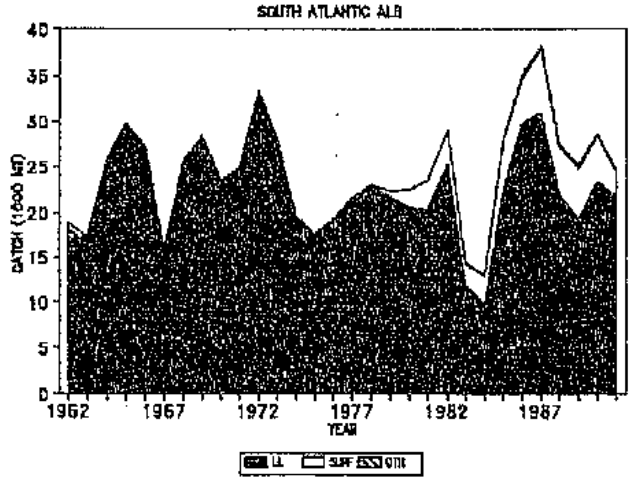
ALB-Fig. 3. Comparison of south Atlantic albacore catch at size for two periods (1980-1982 vs 1989-1991), for surface, longline, and all gears combined.



ALB-Fig. 4. Annual nominal catch (in 1000 MT) of albacore by north and south Atlantic and Mediterranean.



ALB-Fig. 5. North Atlantic albacore catches (in 1000 MT) by gear (accumulative).



ALB-Fig. 6. South Atlantic albacore catches (in 1000 MT) by surface and longline gears (accumulative).

Fig 7 - A

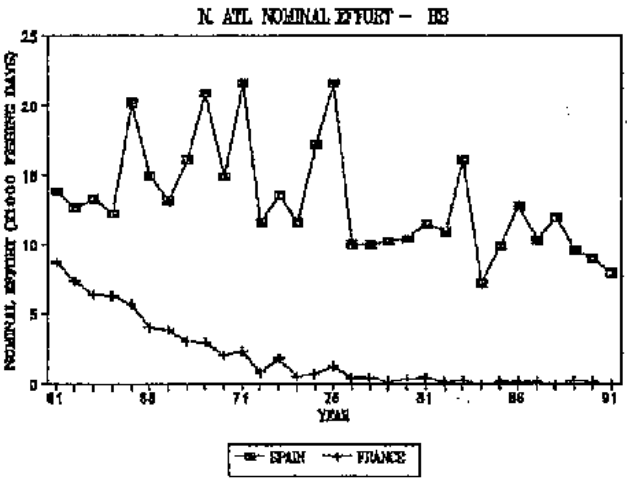


Fig 7 - B

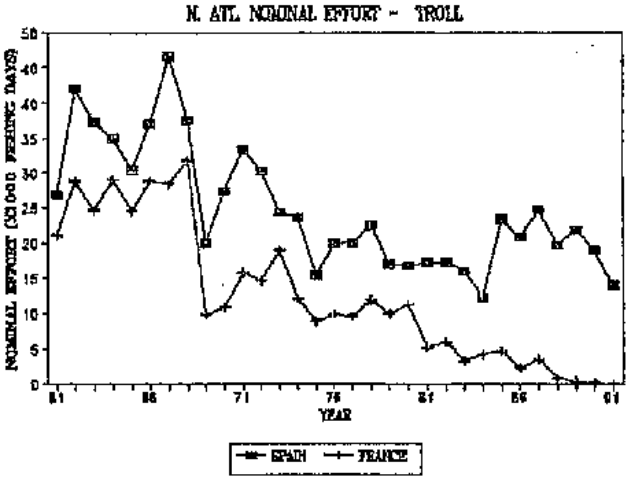
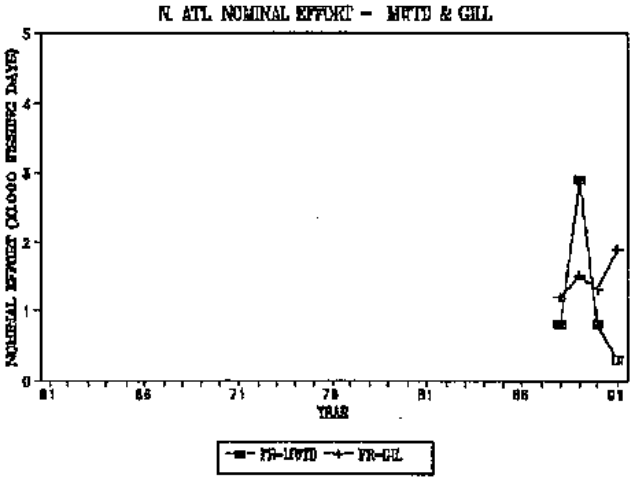
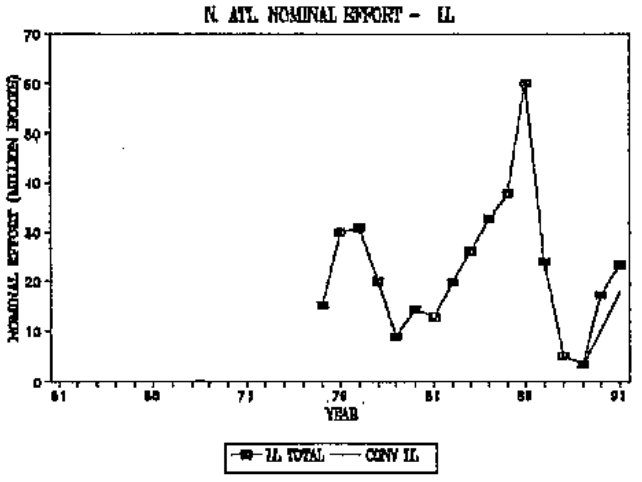


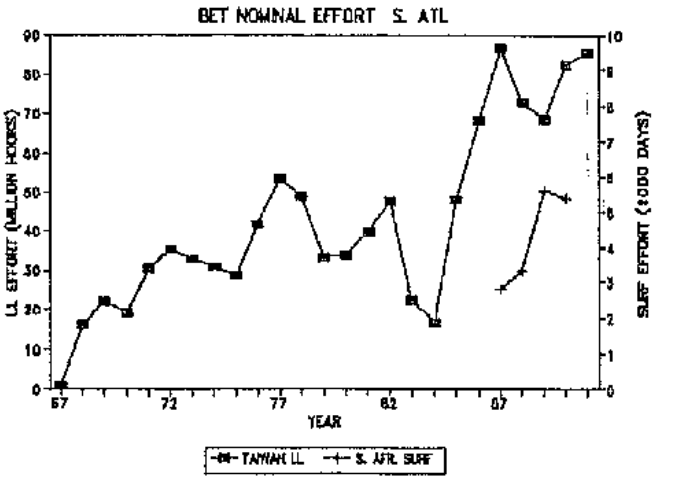
Fig 7 - C



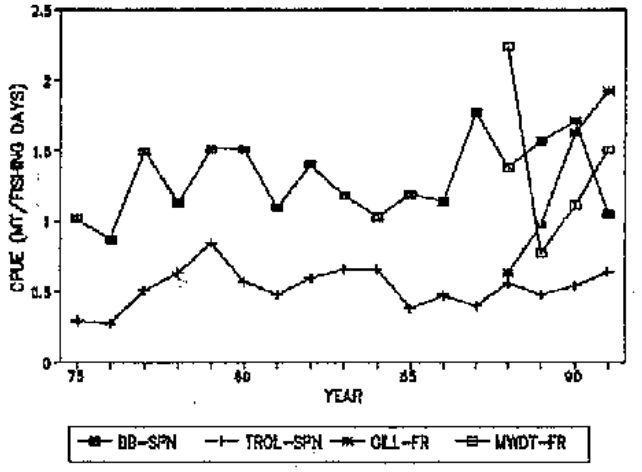
ALB-Fig. 7. Nominal fishing effort for the major north Atlantic surface fisheries.



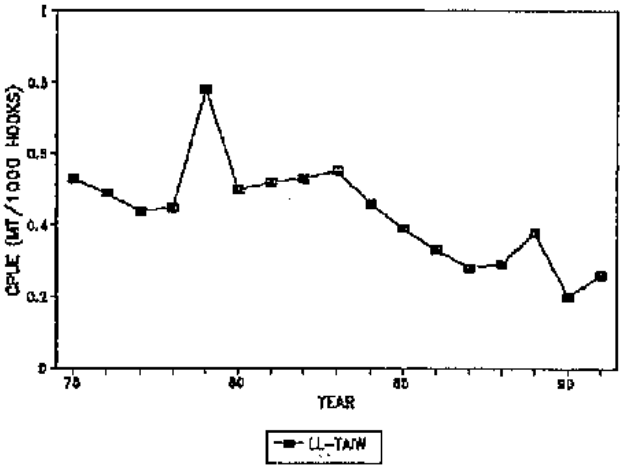
ALB-Fig. 8. Nominal fishing effort for north Atlantic albacore for the major longline fishery.



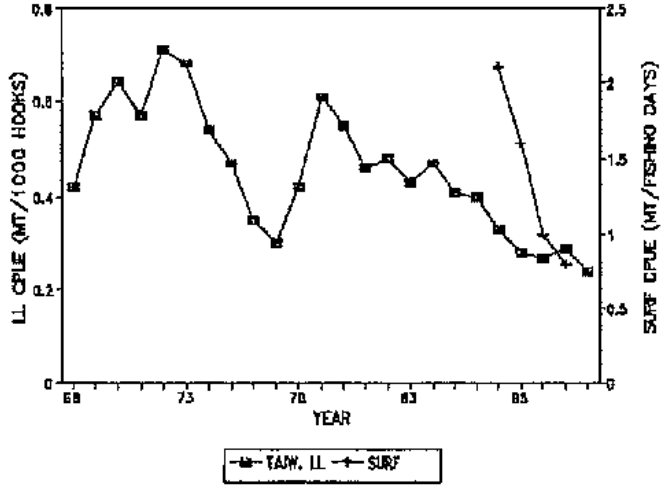
ALB-Fig. 9. Nominal fishing effort for south Atlantic albacore for major fisheries.



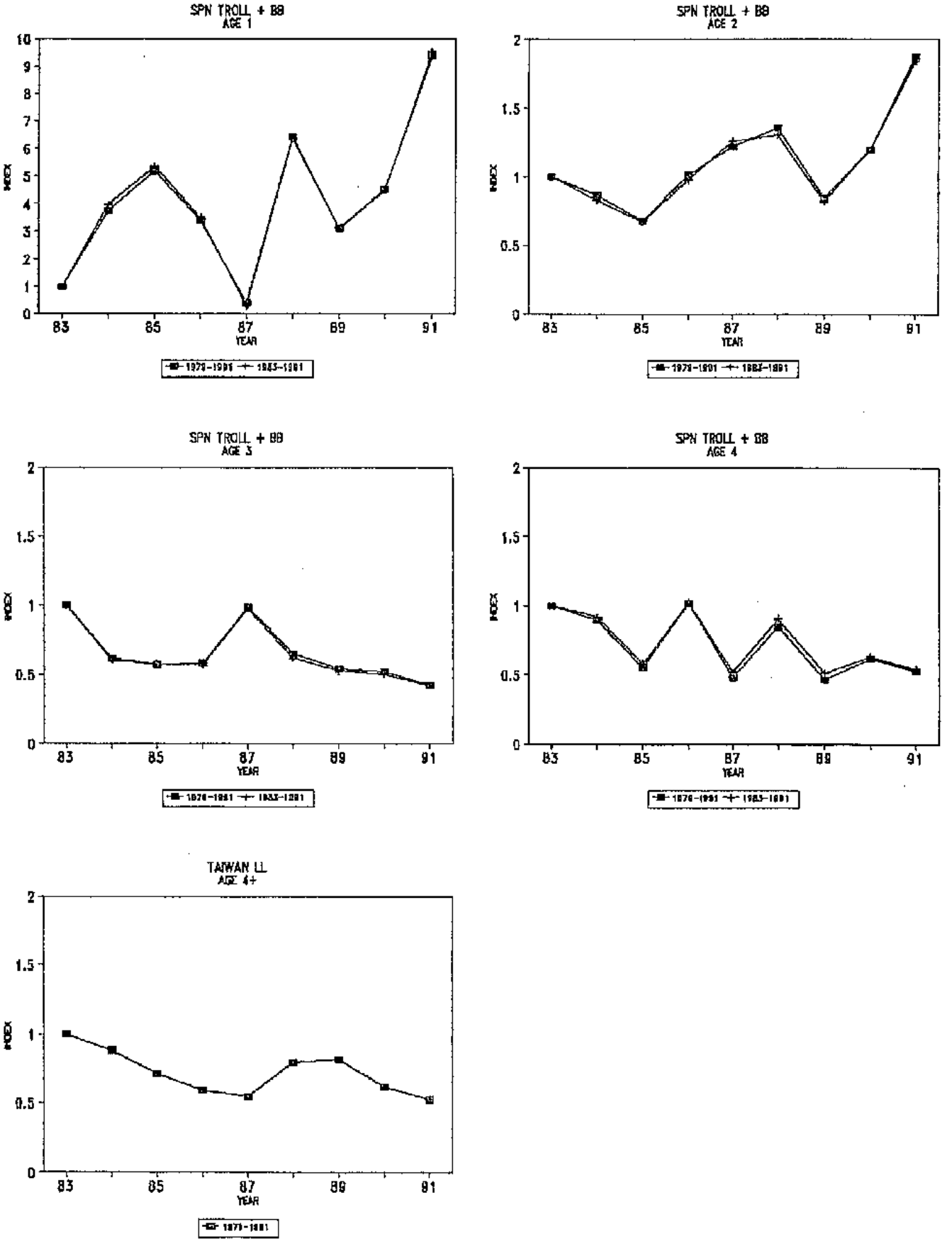
ALB-Fig. 10. Nominal albacore catch per unit of effort for the surface fisheries in the north Atlantic.



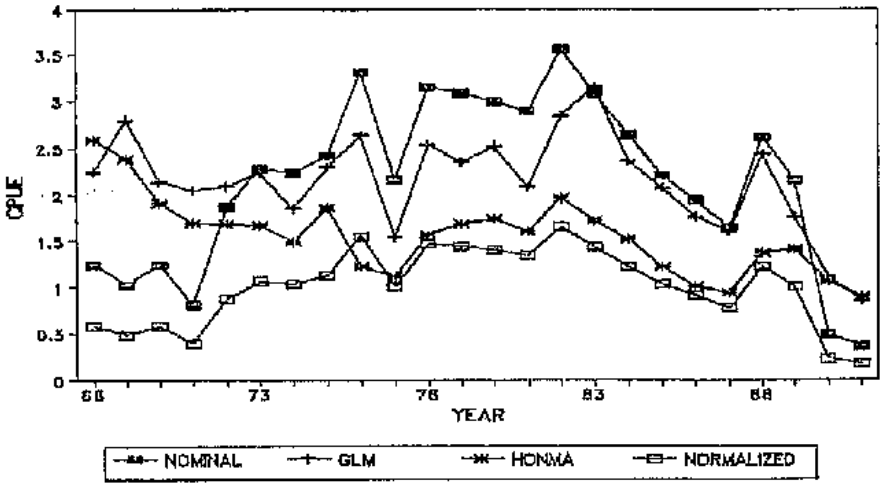
ALB-Fig. 11. Nominal albacore catch per unit of effort for the north Atlantic longline fishery.



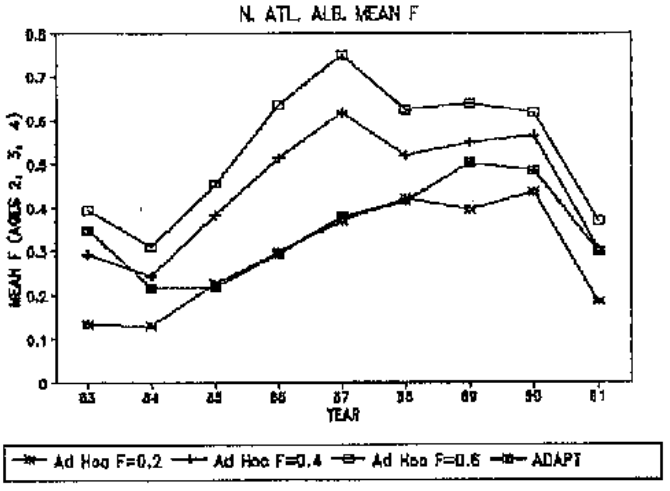
ALB-Fig. 12. Nominal albacore catch per unit of effort for the south Atlantic fisheries.



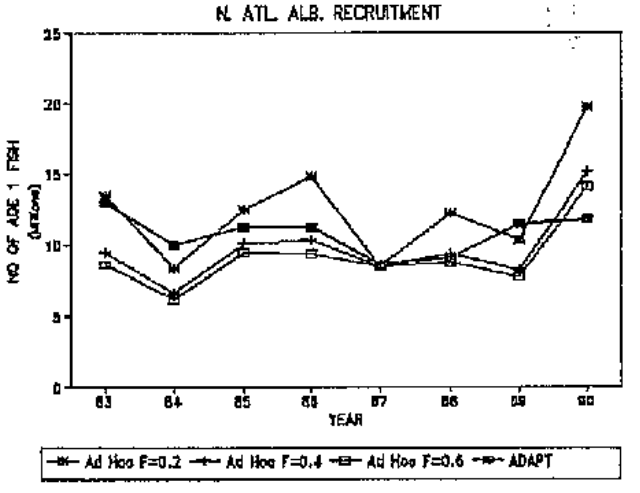
ALB-Fig. 13. North Atlantic albacore abundance indices by age groups used for tuning VPA (relative values to 1.00 in 1983).



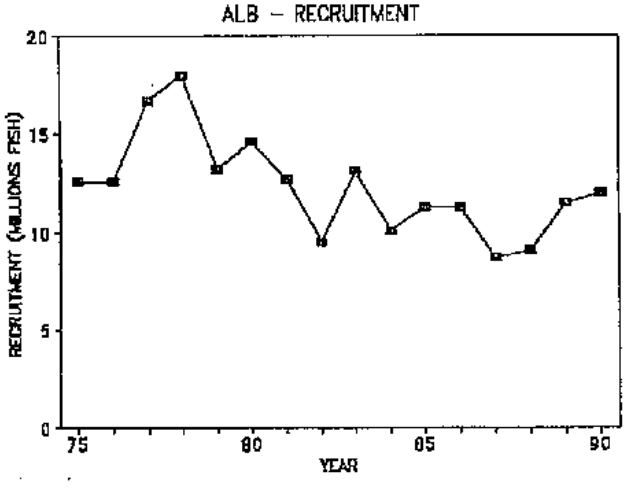
ALB-Fig. 14. Taiwanese longline nominal and adjusted CPUE for the north Atlantic, 1968-1991. Values in number of fish. Source: SCRS/92/104.



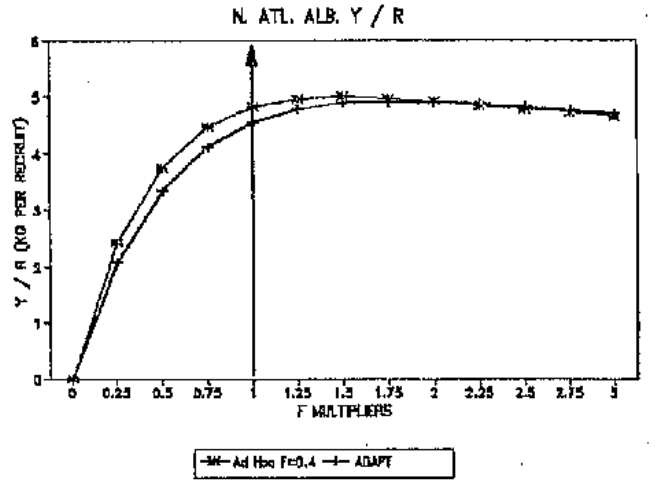
ALB-Fig. 15. Mean fishing mortality (for ages 2, 3 and 4) of north Atlantic albacore estimated by various VPAs.



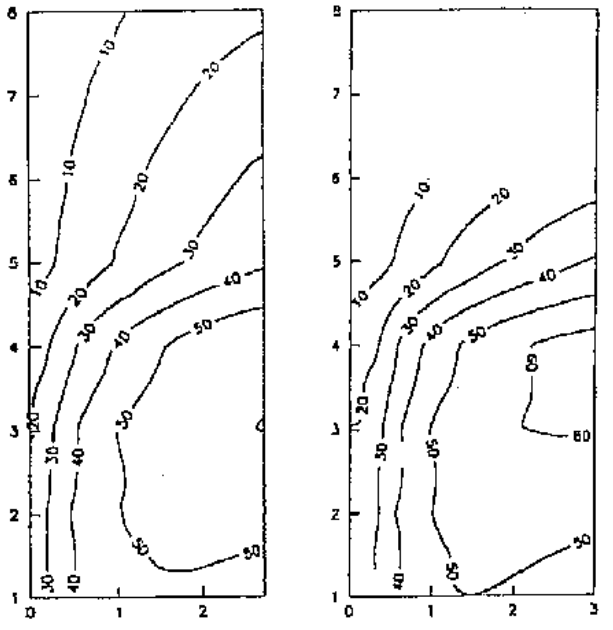
ALB-Fig. 16. Recruitment of north Atlantic albacore, estimated by various VPAs.



ALB-Fig. 17. Recruitment of north Atlantic albacore from 1975 to 1990 estimated by ADAPT (run 11).

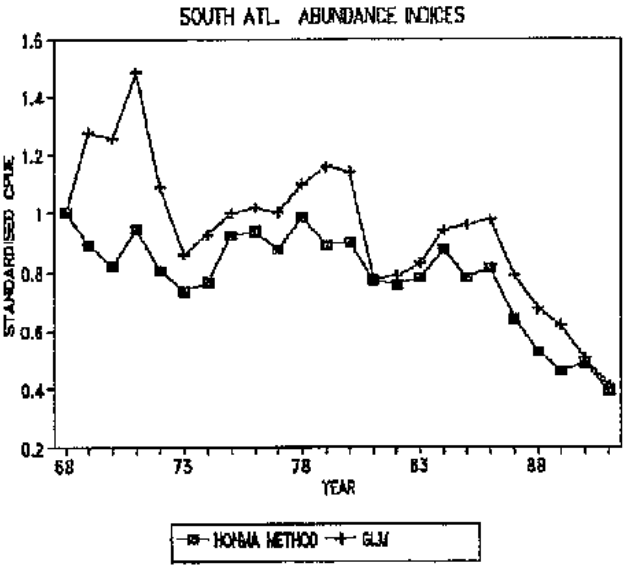


ALB-Fig. 18. Yield per recruit (kgs per recruit) of north Atlantic albacore, estimated by various VPAs.

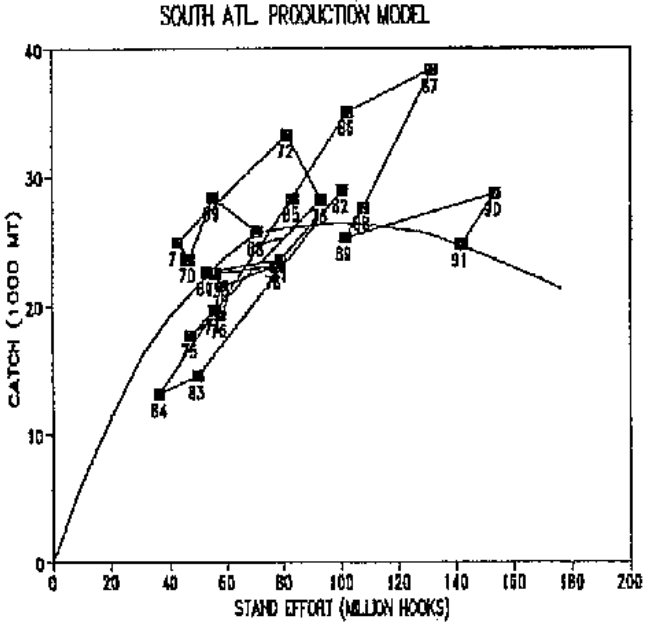


a) 10th ADAPT run. b) Ad-Hoc run (F_{11} ratio = 0.4)

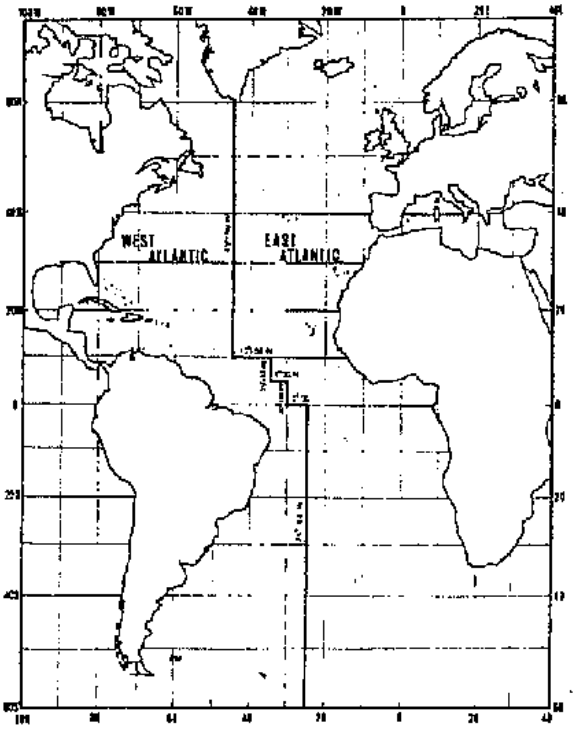
ALB-Fig. 19. Isopleths of yield per recruit (in kgs per recruit) of the north Atlantic stock according to F multipliers of the 1987-1990 situation, and age at first capture (tc).



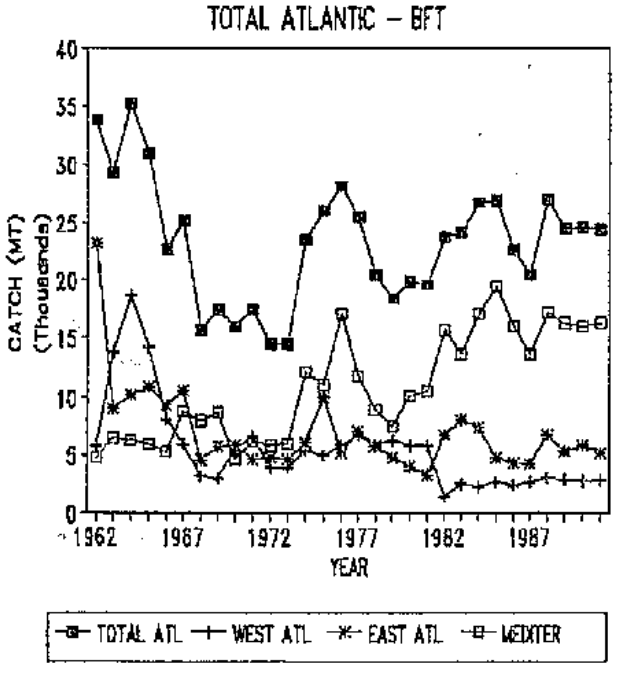
ALB-Fig. 20. Standardized abundance indices of Taiwanese longline for the south Atlantic albacore stock (scaled to 1976 value).



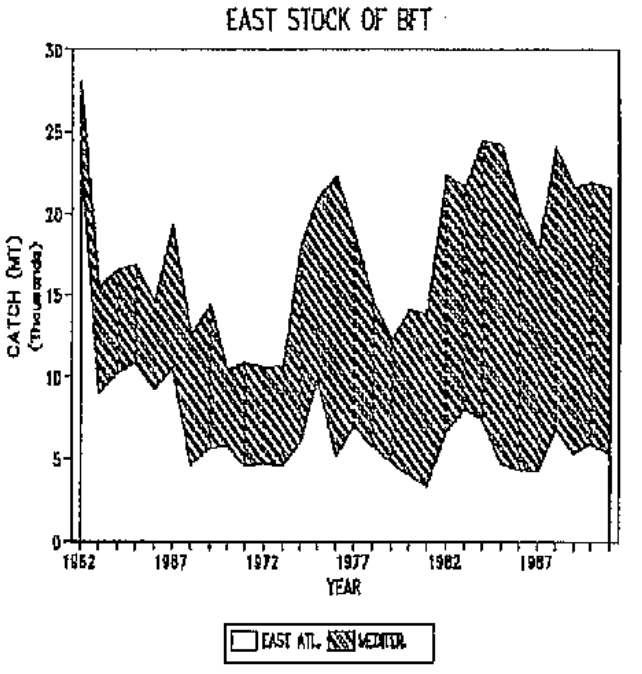
ALB-Fig. 21. South Atlantic albacore production model estimates (with k=3 and m=1.001).



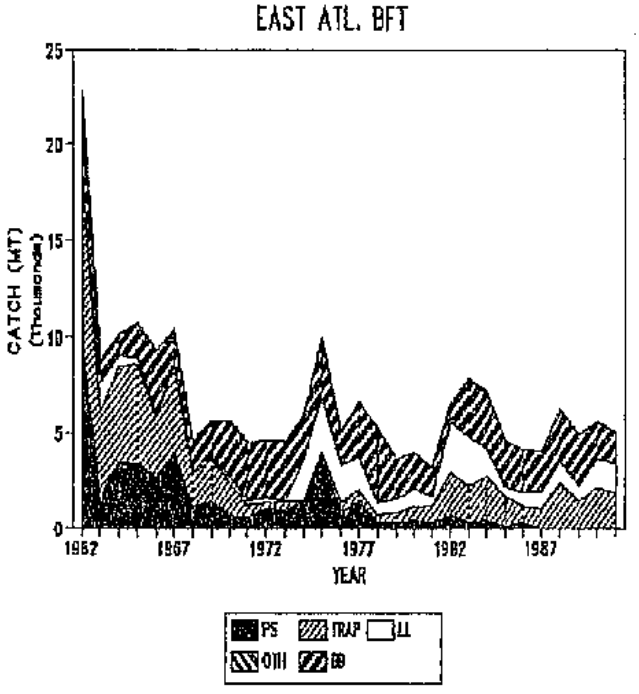
BFT-Fig. 1. Map of the Atlantic Ocean showing the line used to separate the eastern and western components of the Atlantic bluefin stock.



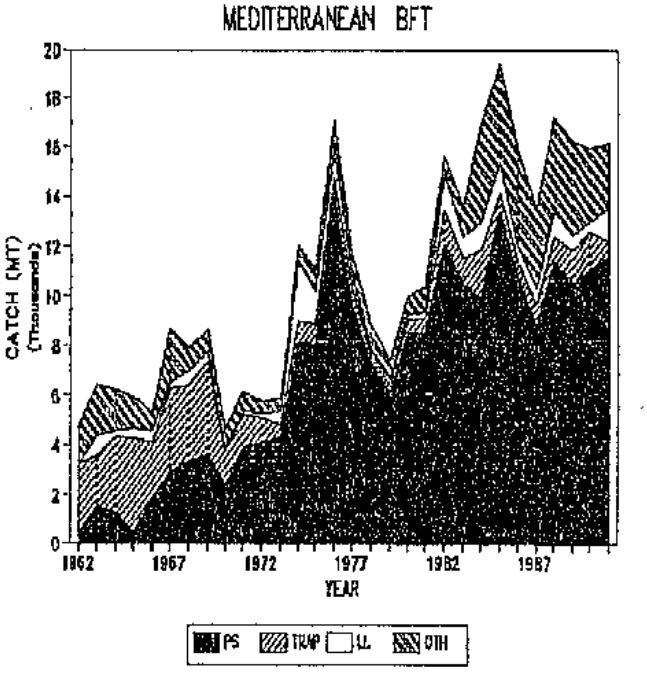
BFT-Fig. 2. Total Atlantic bluefin catches (MT) by regions and by major gears.



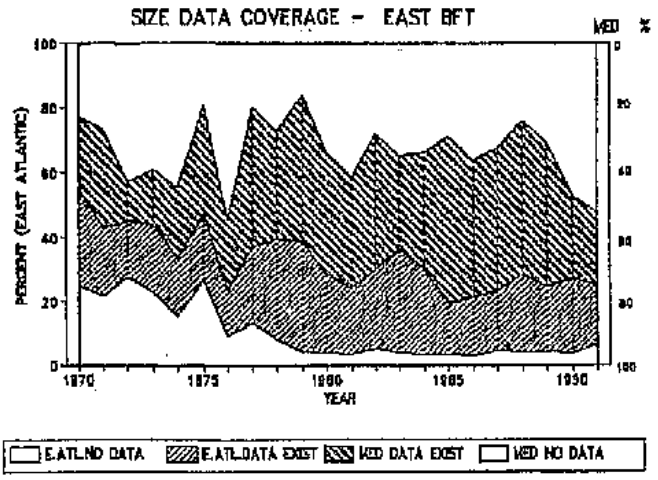
BFT-Fig. 3. Accumulative bluefin catches (MT) from the east Atlantic and Mediterranean Sea.



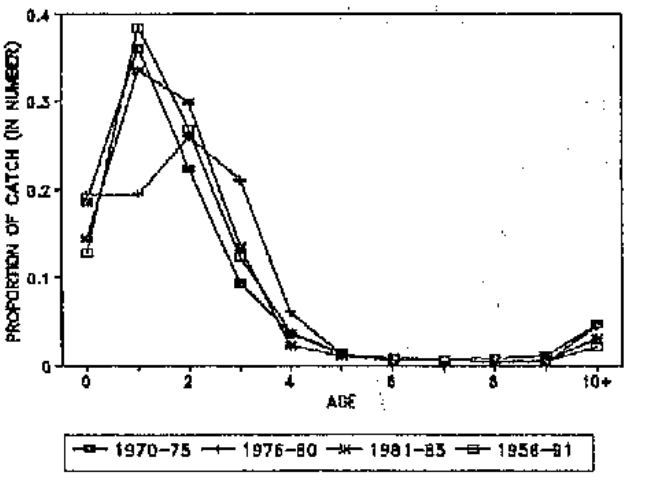
BFT-Fig. 4a. Total accumulative bluefin catches (MT) by gears for the east Atlantic.



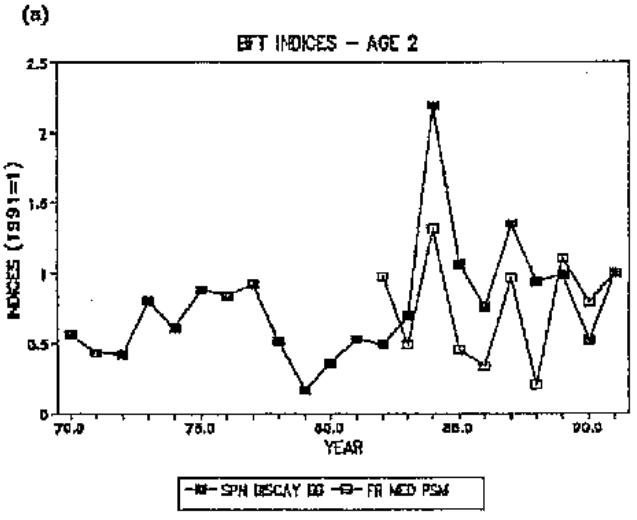
BFT-Fig. 4b. Total accumulative bluefin catches (MT) by gears for the Mediterranean Sea.

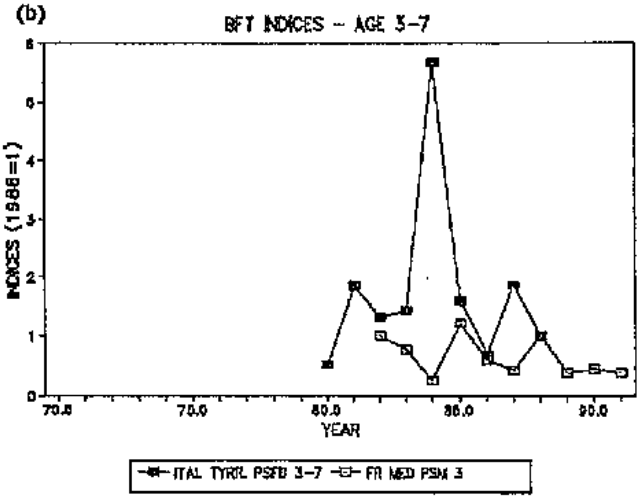


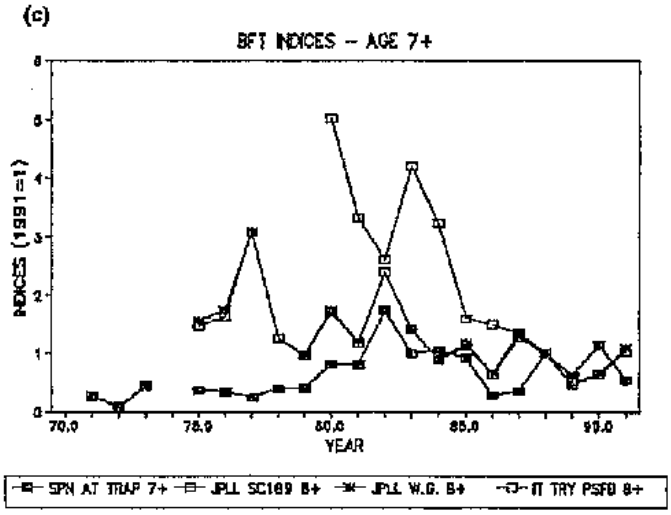
BFT-Fig. 5. Proportion of bluefin landings in the east Atlantic and Mediterranean for which no size samples are available.



BFT-Fig. 6. Proportion of catch at age used in the base-case assessment for different periods between 1970 and 1991.

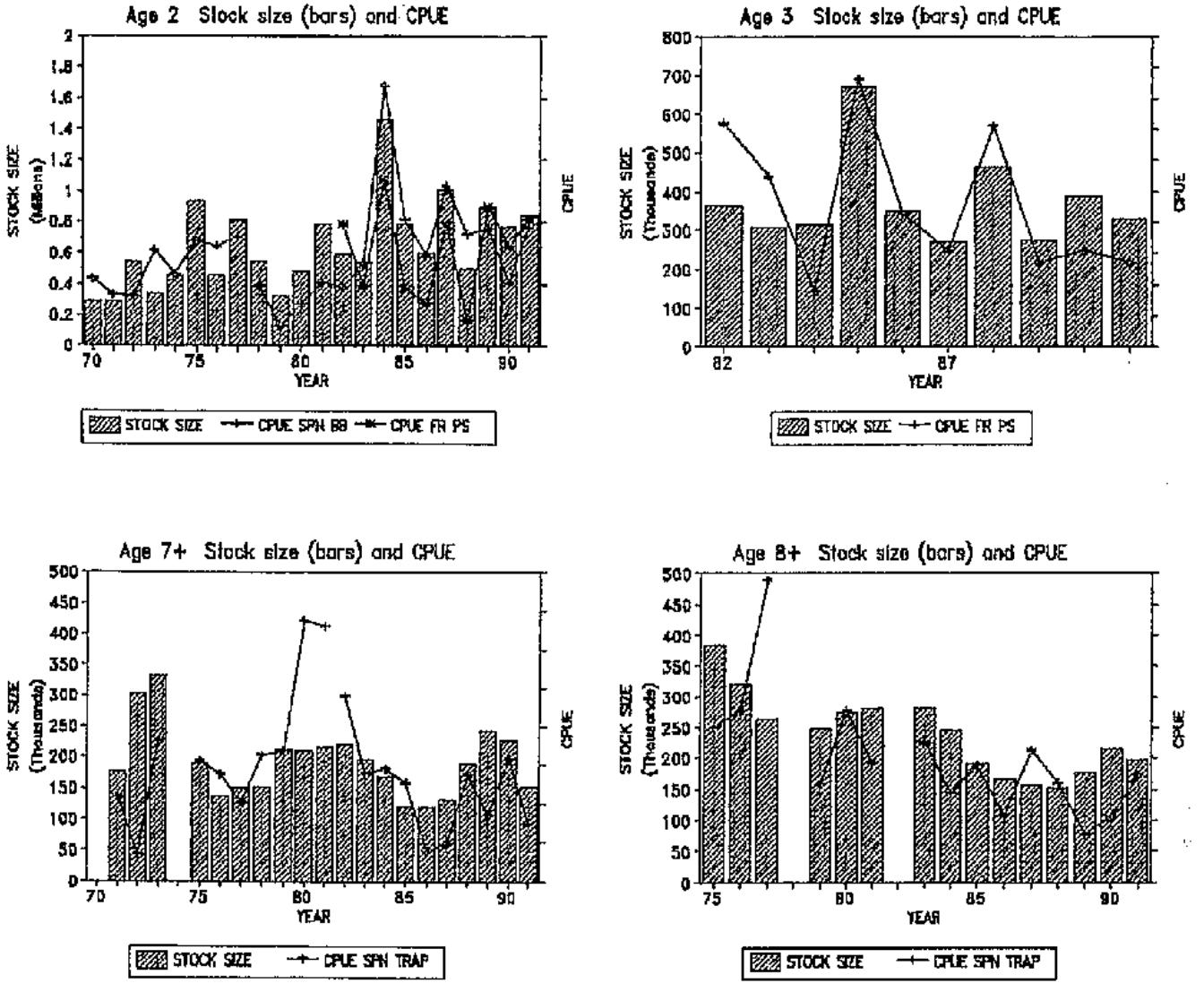




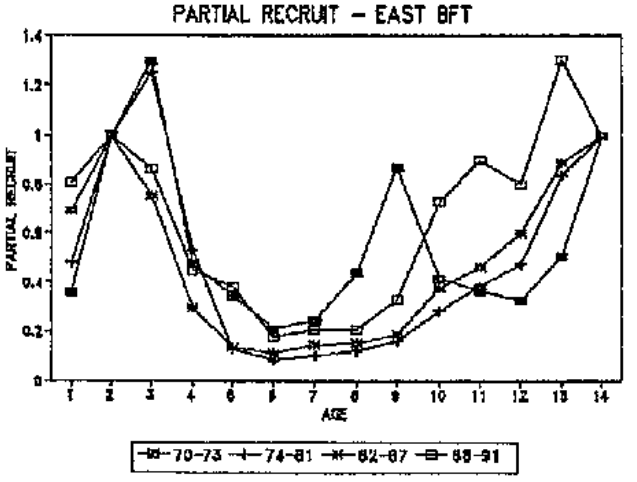


BFT-Fig. 7. CPUE series for various age groups of bluefin tuna:

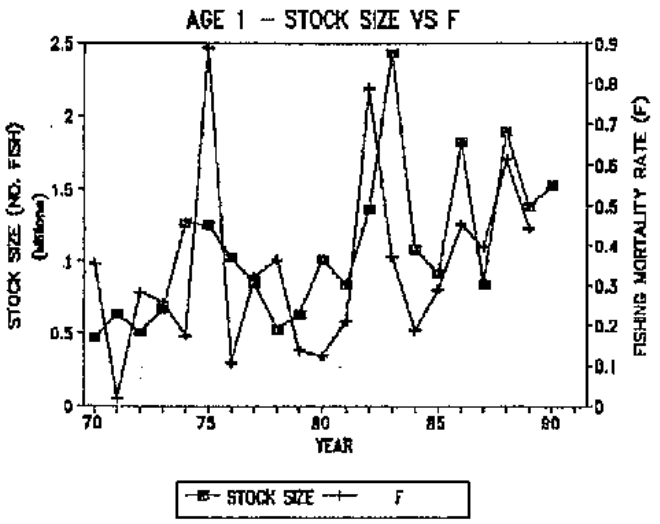
(a) Age 2: Spanish baitboats in the Bay of Biscay and French purse seiners in the Gulf of Lion.
(b) Ages 3-7: Italian purse seiners in the Tyrrhenian Sea and French purse seiners in the Gulf of Lion.
(c) Ages 7+: Spanish Atlantic traps and Japanese longline (east Atlantic and Mediterranean combined).

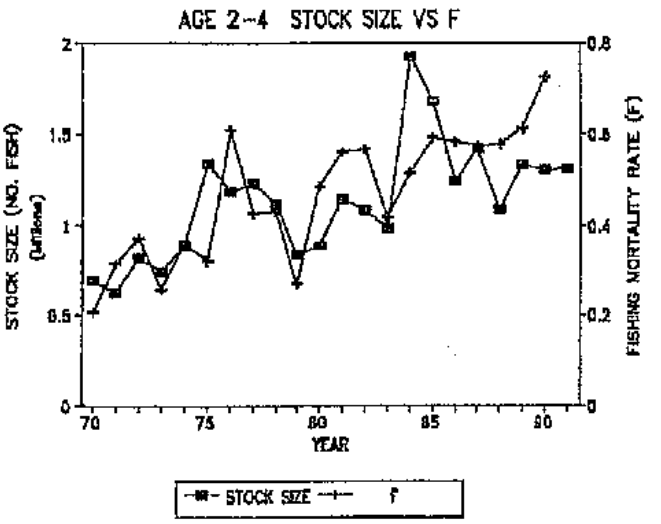


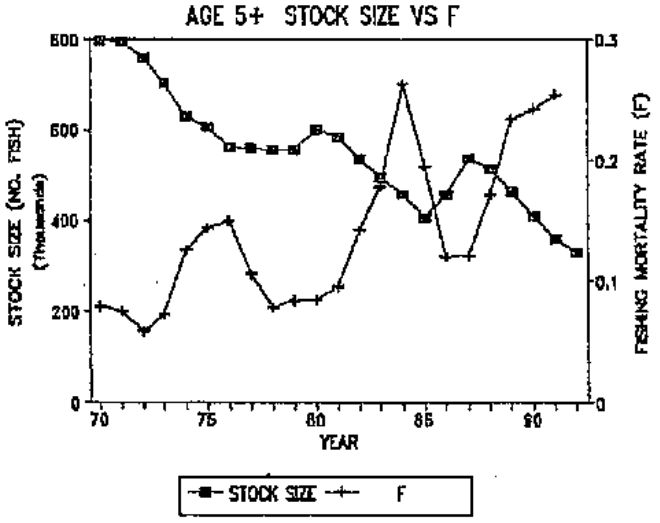
BFT-Fig. 8. **CPUE series fit to stock size in the base case assessment by age group.**

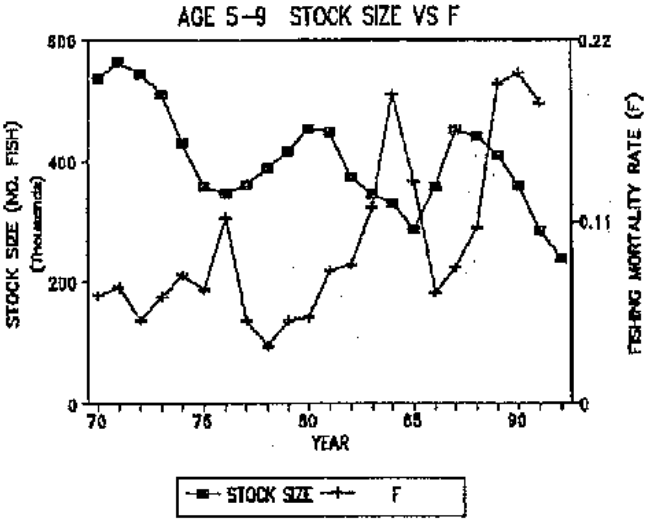


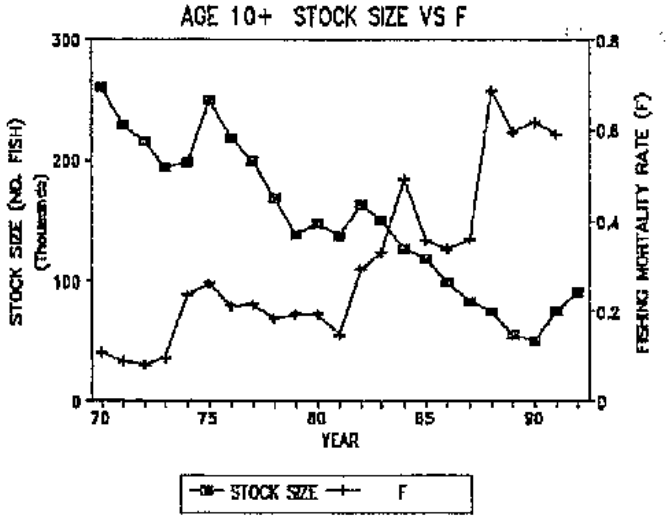
BFT-Fig. 9. **Partial recruitment by age for the periods of 1970-73, 1974-81, 1982-87 and 1988-91.**



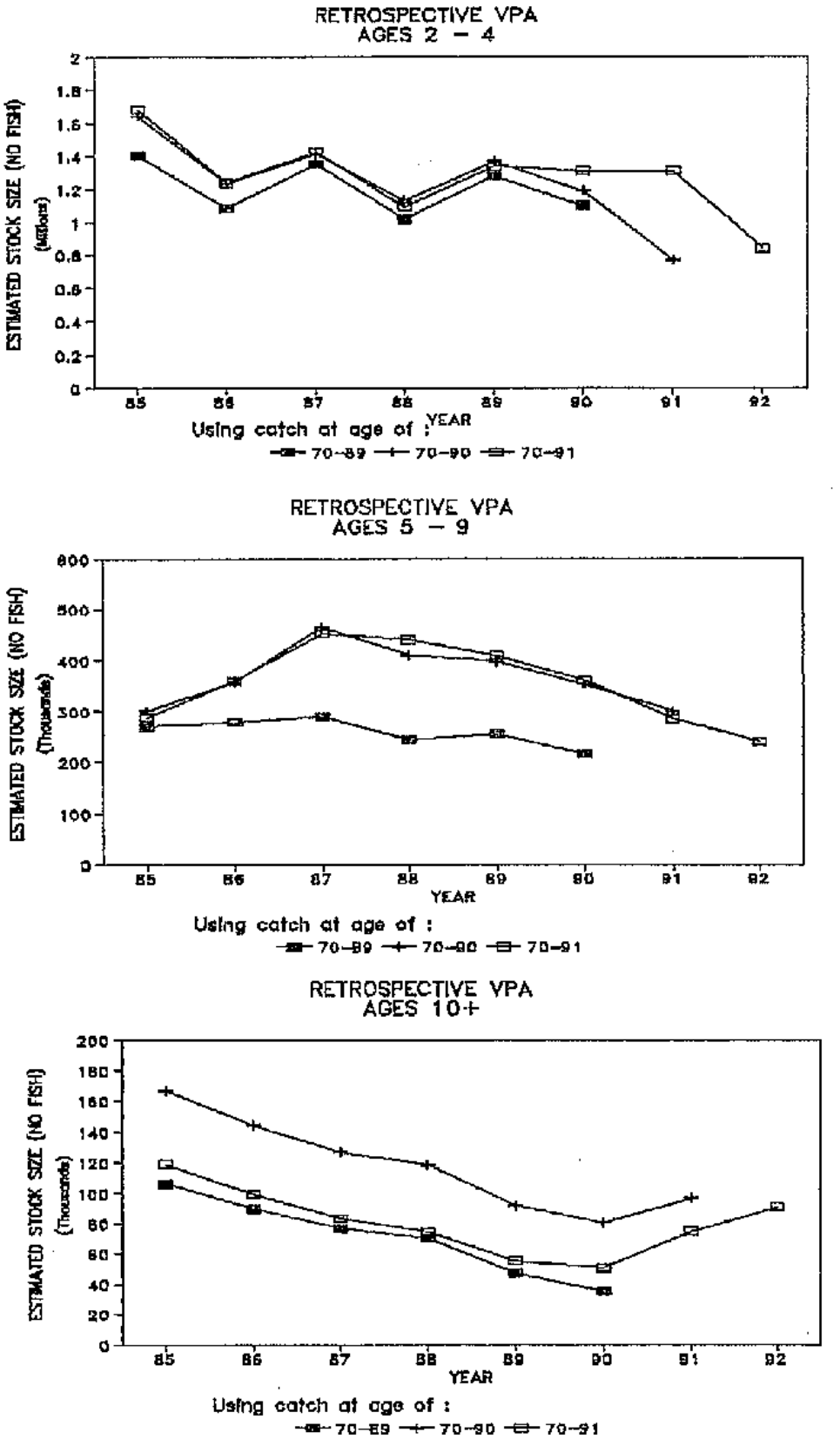




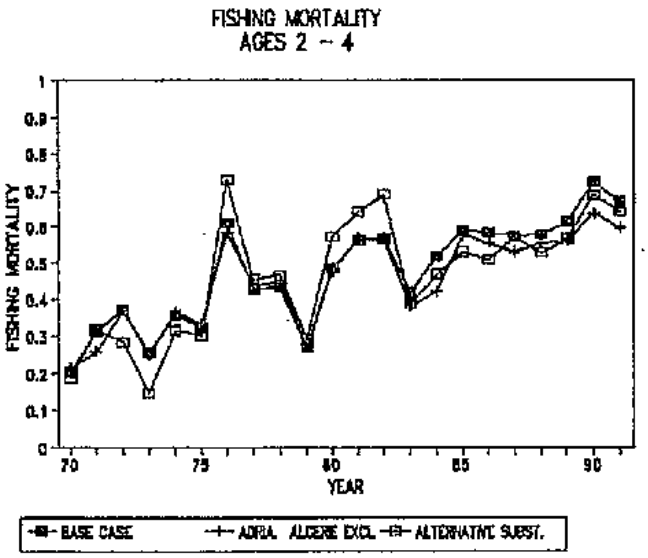


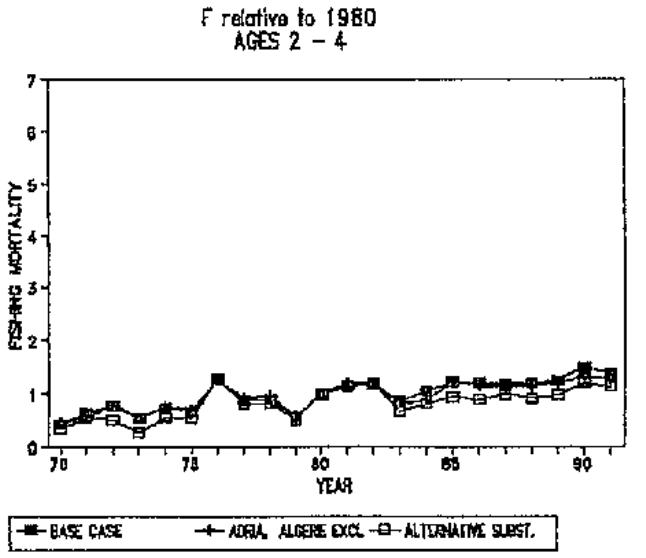


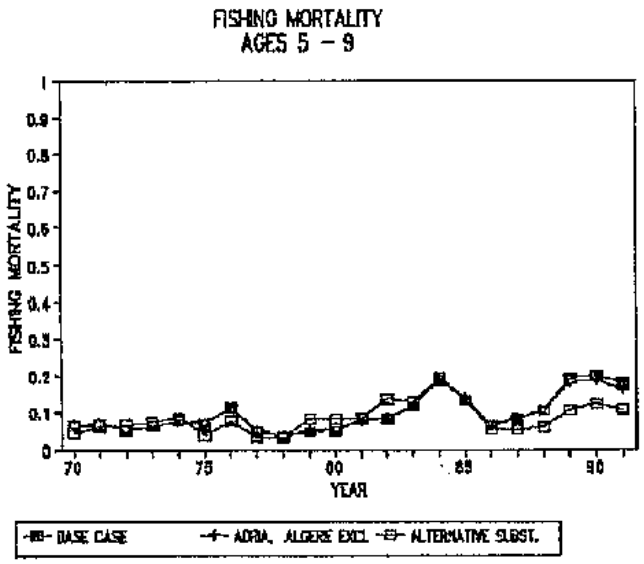
BFT-Fig. 10. Stock size and fishing mortality rate estimates by age group from the base-case assessment.

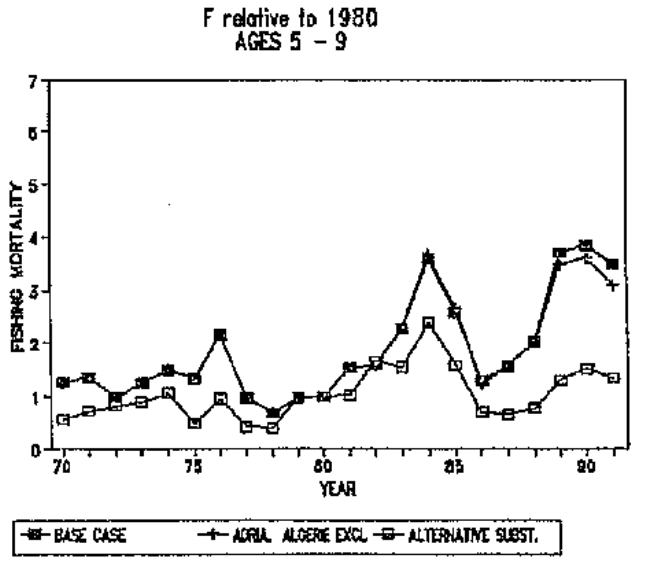


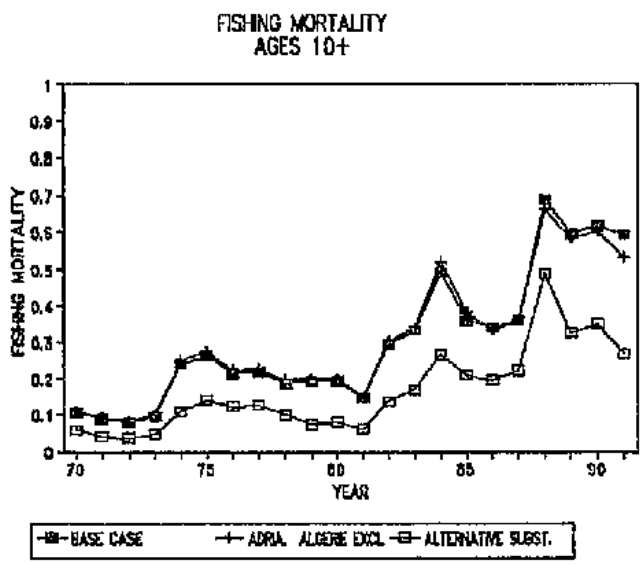
BFT-Fig. 11. Estimated stock size (number of fish) of east Atlantic bluefin with retrospective VPA using various catch-at-size tables.

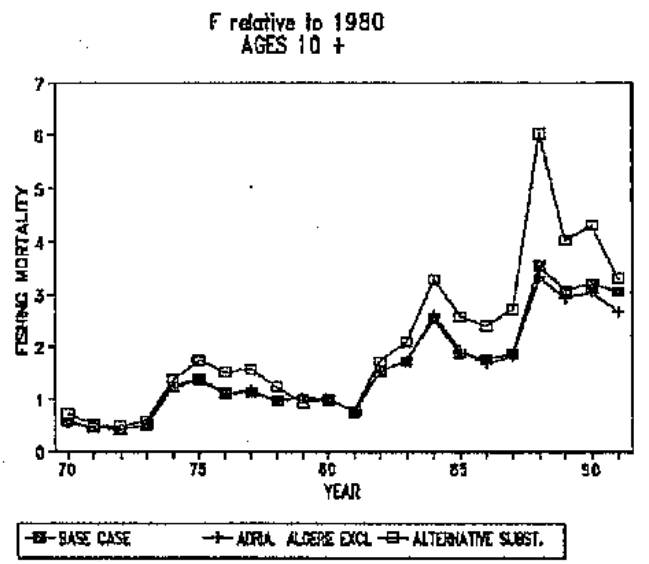






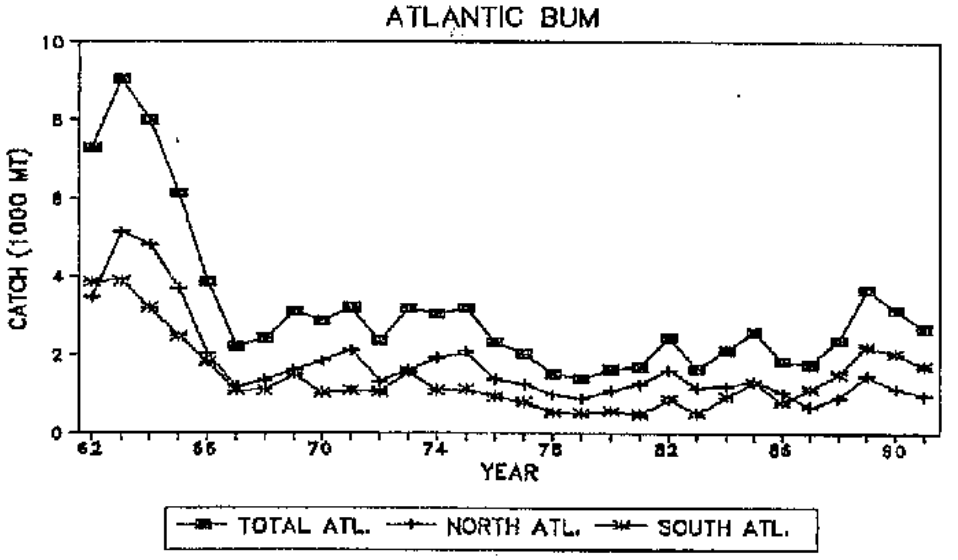




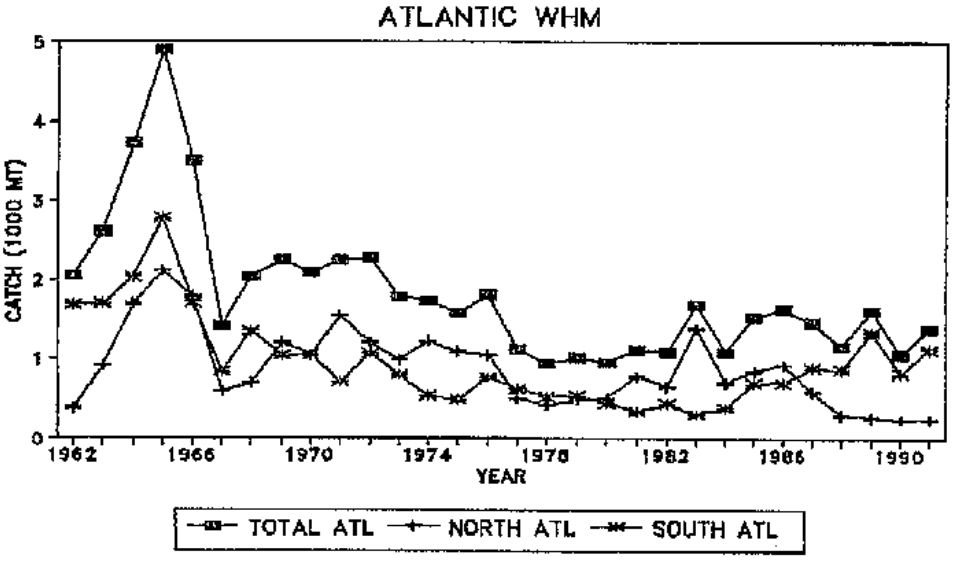


BFT-Fig. 12. Fishing mortality rate by age group for the sensitivity analyses conducted.

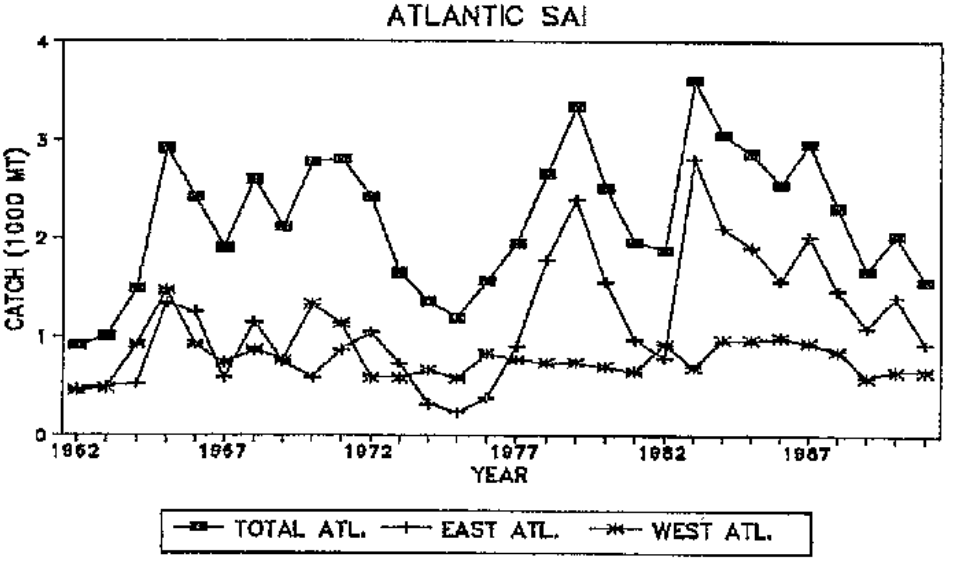
(a) Atlantic blue marlin



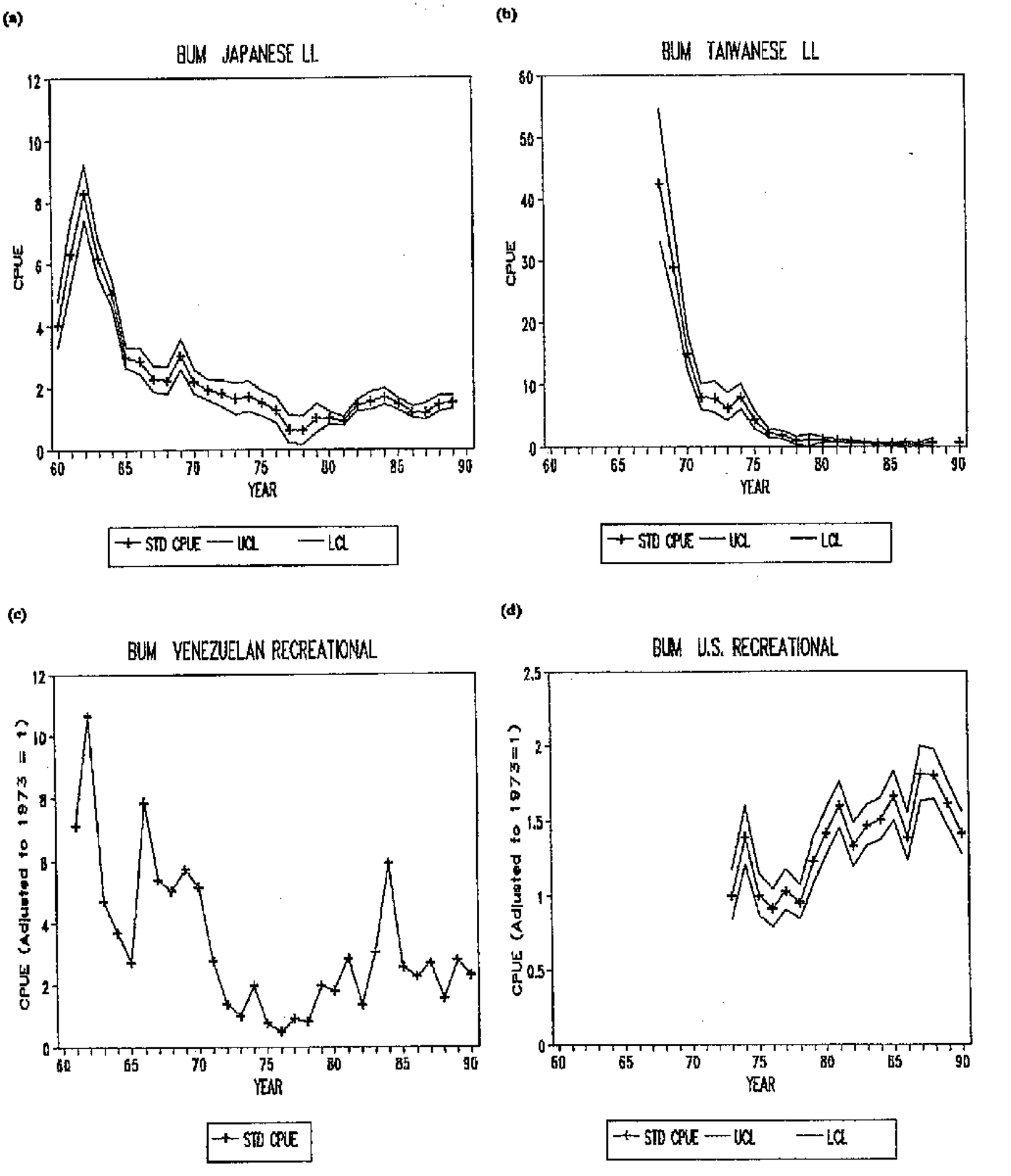
(b) Atlantic white marlin



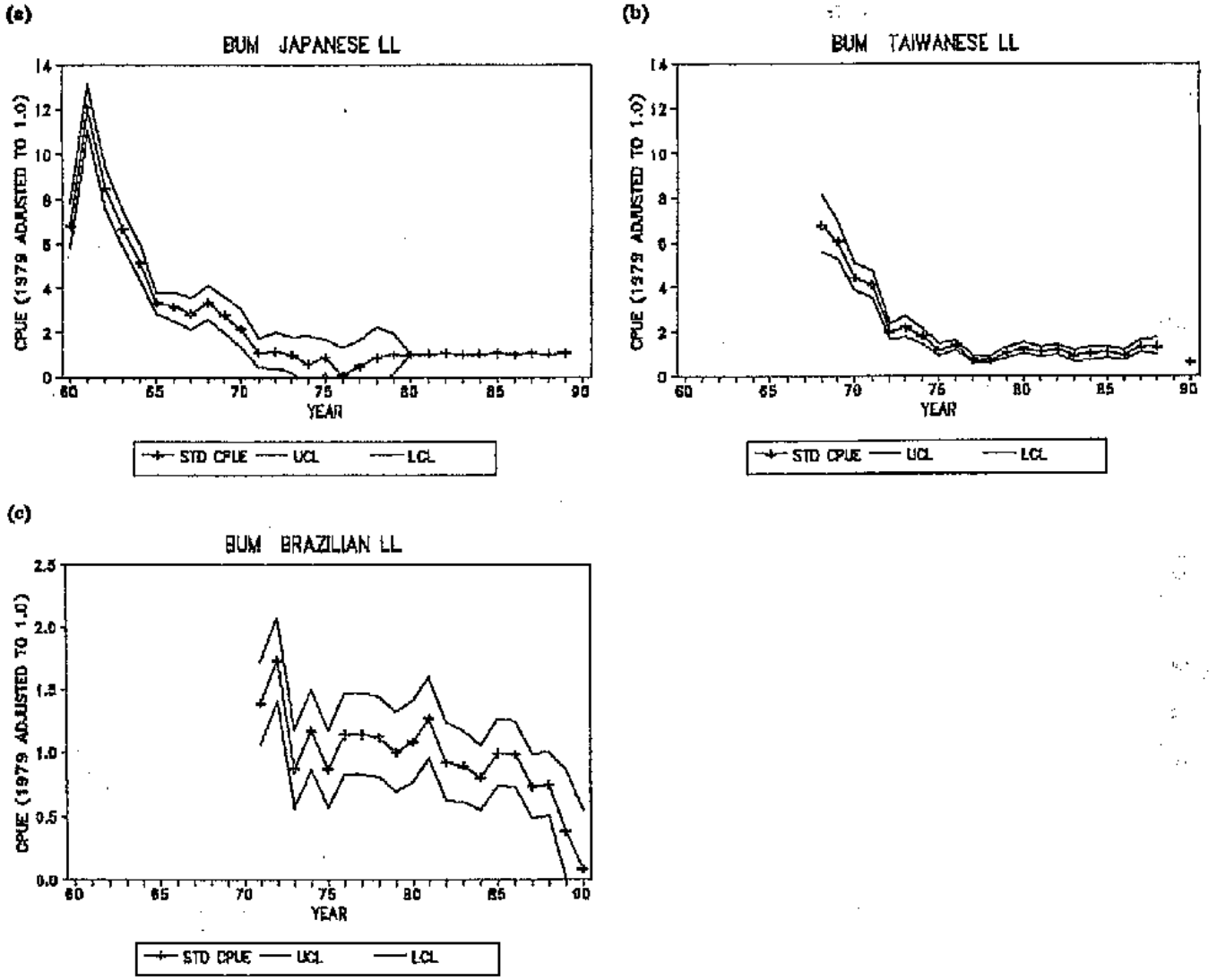
(c) Atlantic sailfish



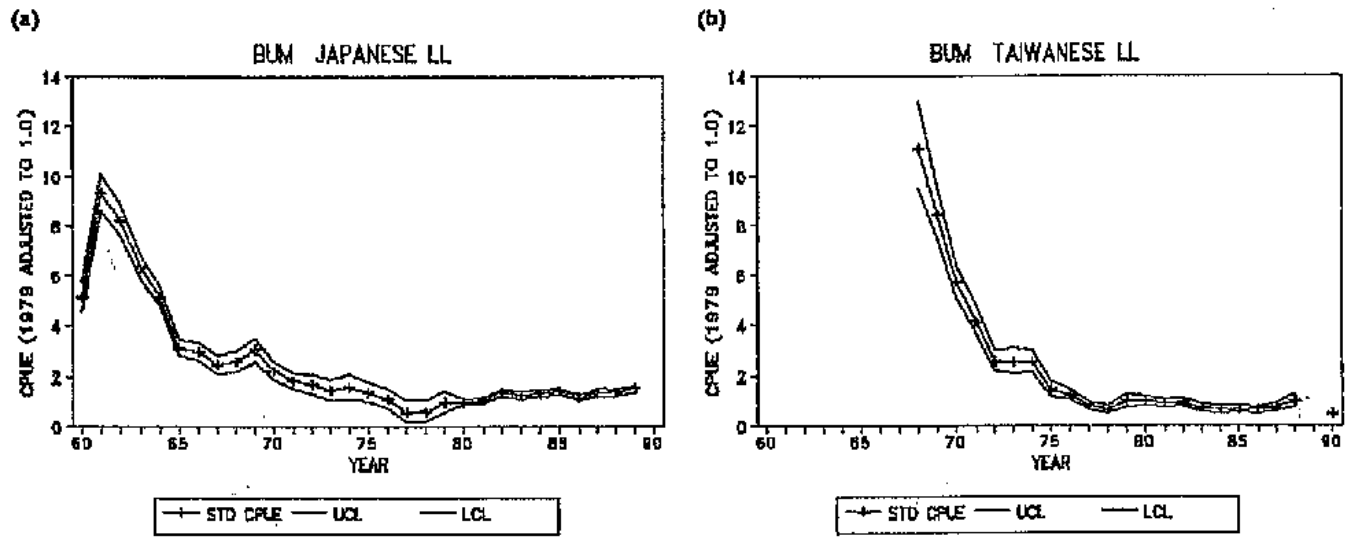
BIL-Fig. 1. Total Atlantic billfish catches (in 1000 MT), by region.



BIL-Fig. 2. Annual standardized mean CPUEs for blue marlin from the Japanese (a) and Taiwanese (b) longline fisheries and the Venezuelan (c) and U.S. (d) recreational fisheries, for the North Atlantic, with associated approximate 90% confidence bounds. Values are adjusted to 1.00 in 1979 or in case (d) in 1980.

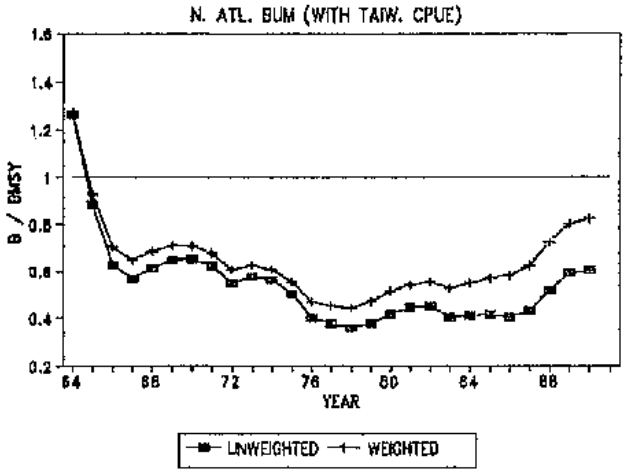


BIL-Fig. 3. Annual standardized mean CPUEs for blue marlin from the Japanese (a), Taiwanese (b), and Brazilian (c) longline fisheries for the South Atlantic, with associated approximate 90% confidence bounds. Values are adjusted to 1.00 only in 1979.

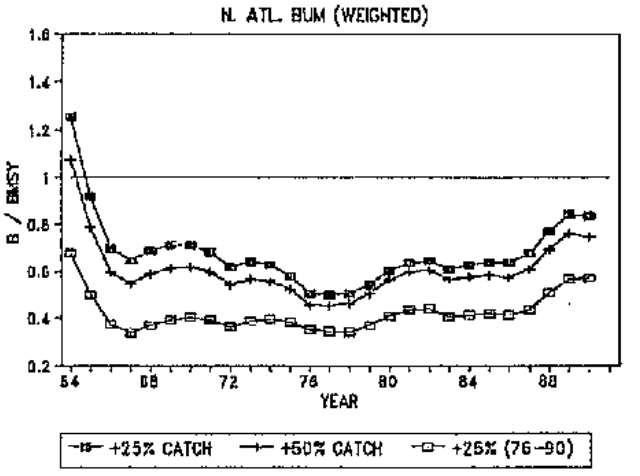


BIL-Fig. 4. Annual standardized mean CPUEs for blue marlin from the Japanese (a) and Taiwanese (b) longline fisheries for the total Atlantic, with associated approximate 90% confidence bounds. Values are adjusted to 1.00 in 1979 and 1980.

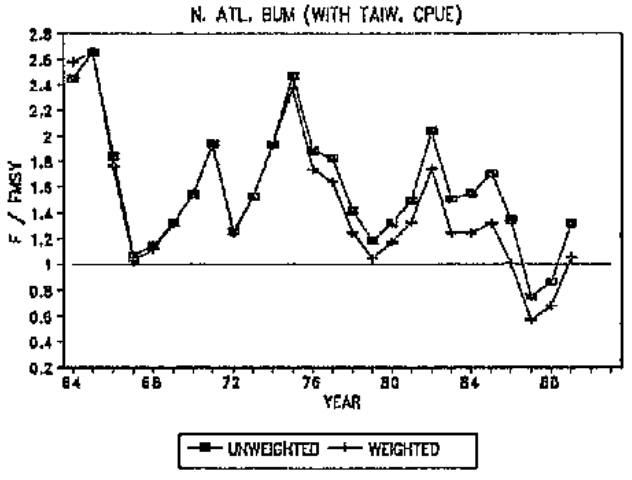
(a) Estimated trajectory of B/B_{MSY}



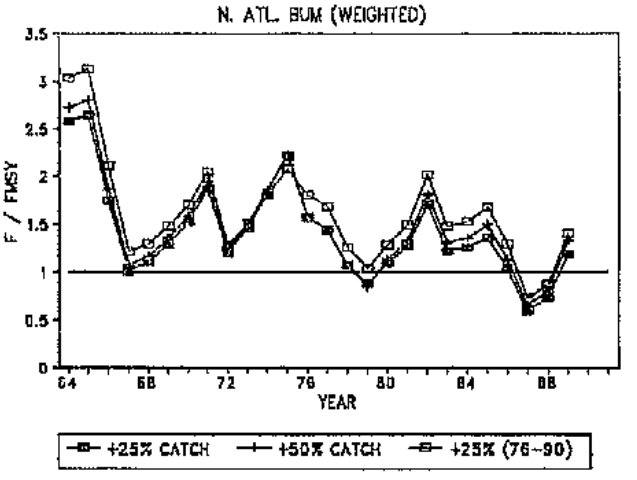
(b) Sensitivity tests for estimated trajectory of B/B_{MSY}



(c) Estimated trajectory of F/F_{MSY}

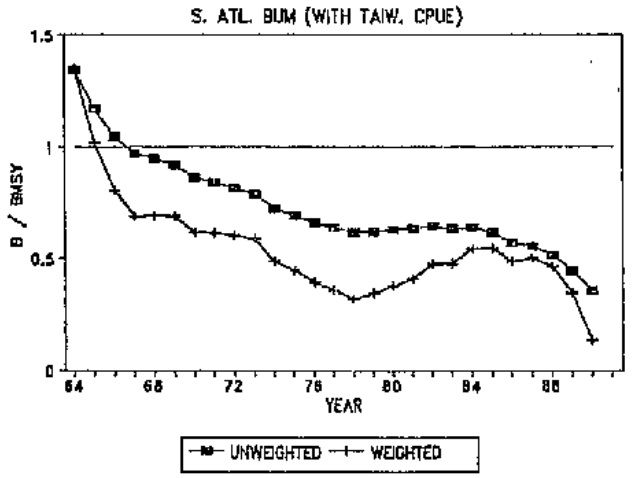


(d) Sensitivity tests for estimated trajectory of F/F_{MSY}

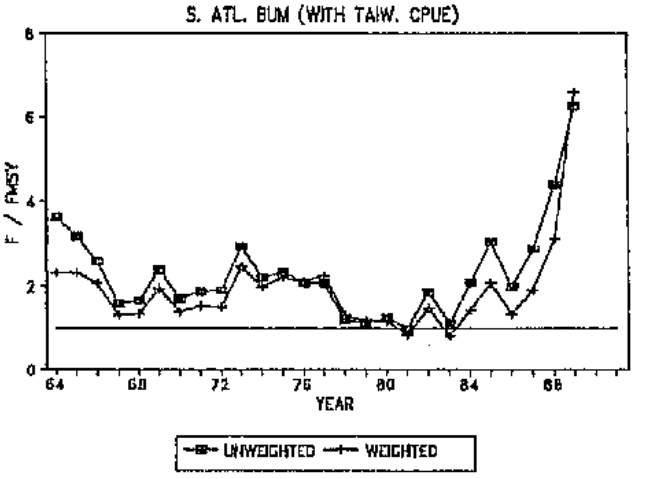


BIL-Fig. 5. Estimated trajectory of B/B_{MSY} and F/F_{MSY} and the sensitivity tests for north Atlantic blue marlin. The first three years have been omitted, as estimates are less precise.

(a) Estimated trajectory of B/B_{MSY}

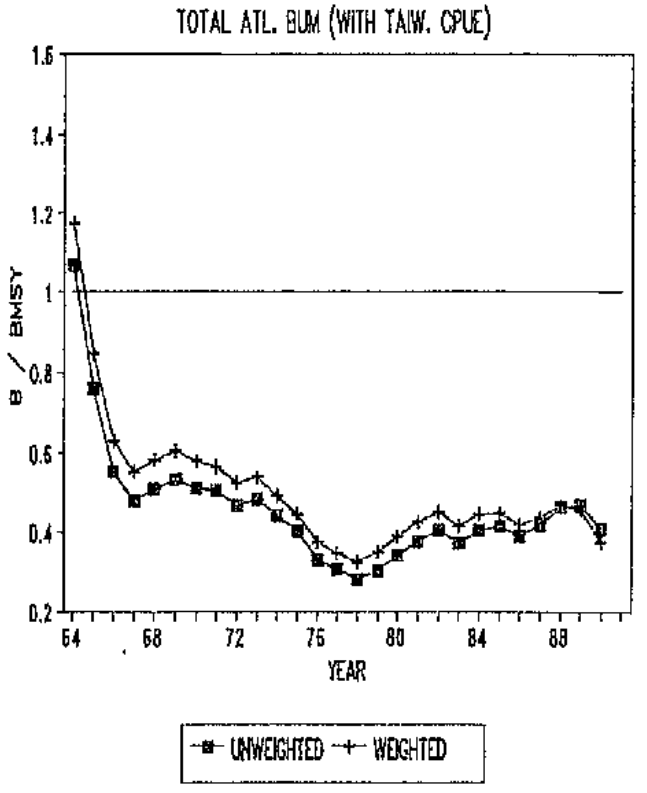


(c) Estimated trajectory of F/F_{MSY}

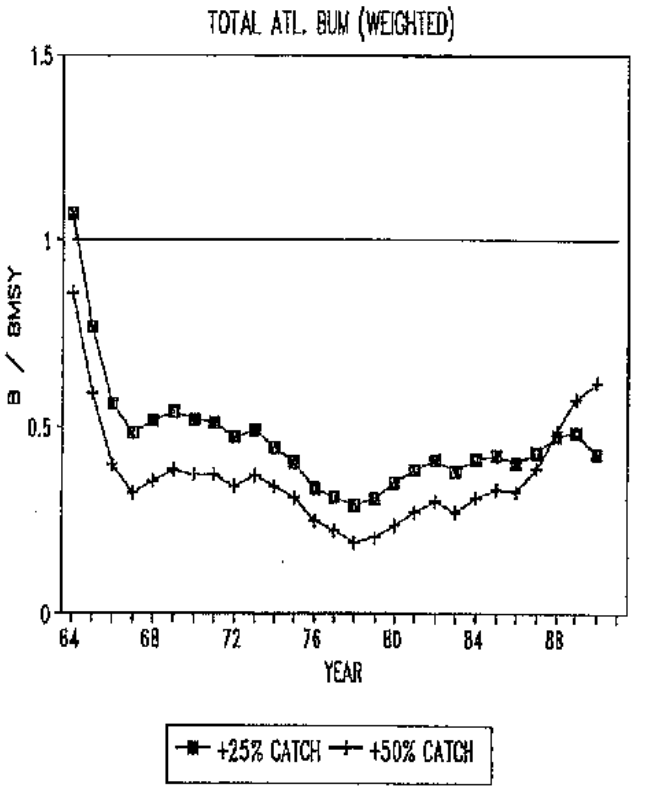


BIL-Fig. 6. Estimated trajectory of B/B_{MSY} and F/F_{MSY} for south Atlantic blue marlin. The first three years have been omitted, as estimates are less precise.

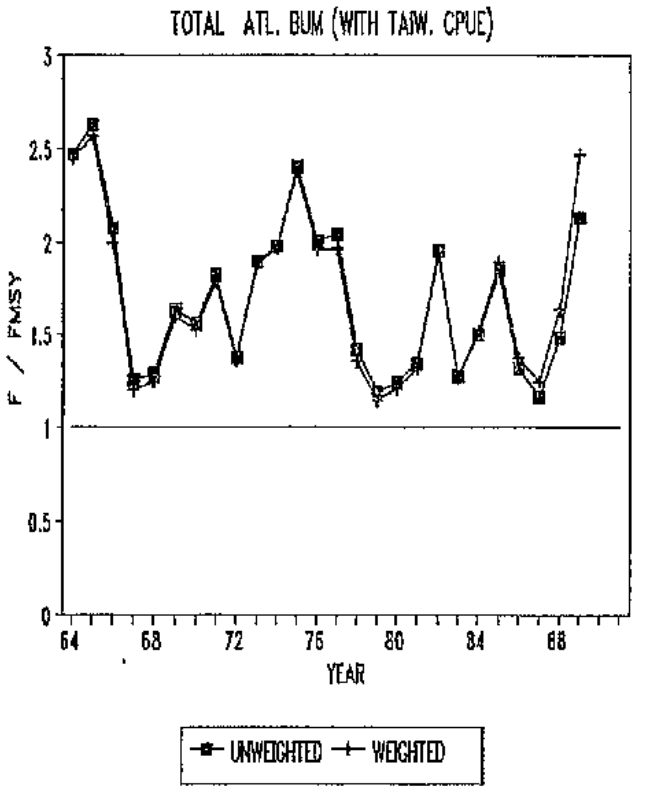
(a) Estimated trajectory of B/B_{MSY}



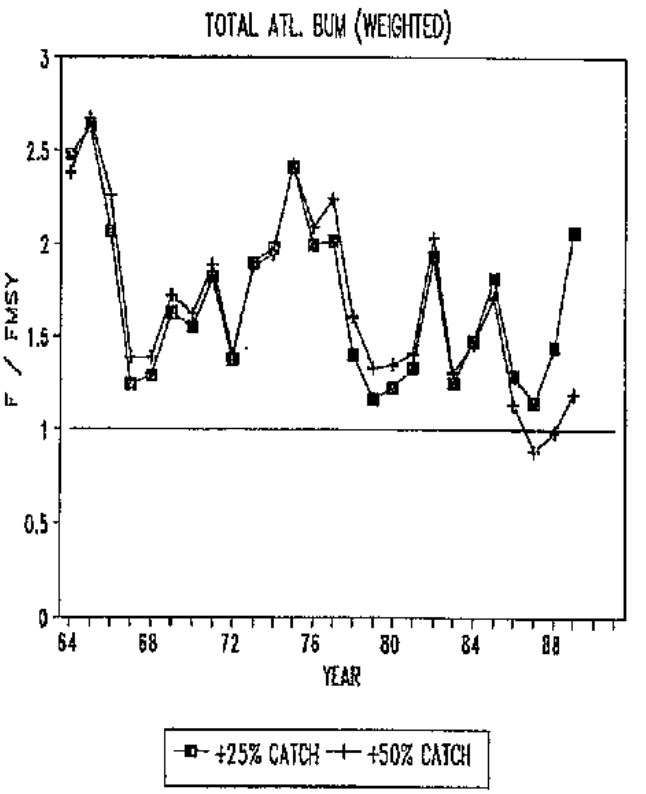
(b) Sensitivity tests for estimated trajectory of B/B_{MSY}



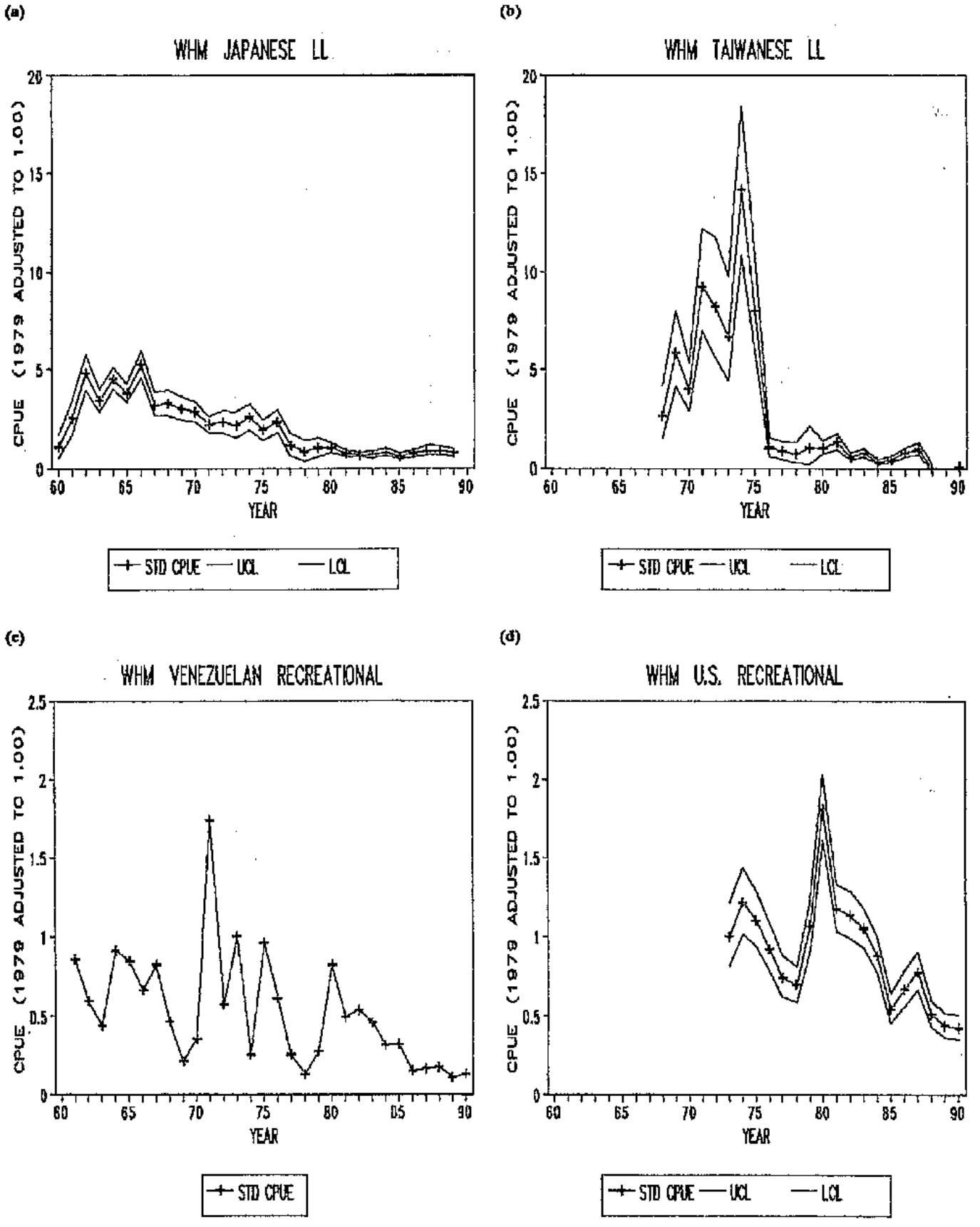
(c) Estimated trajectory of F/F_{MSY}



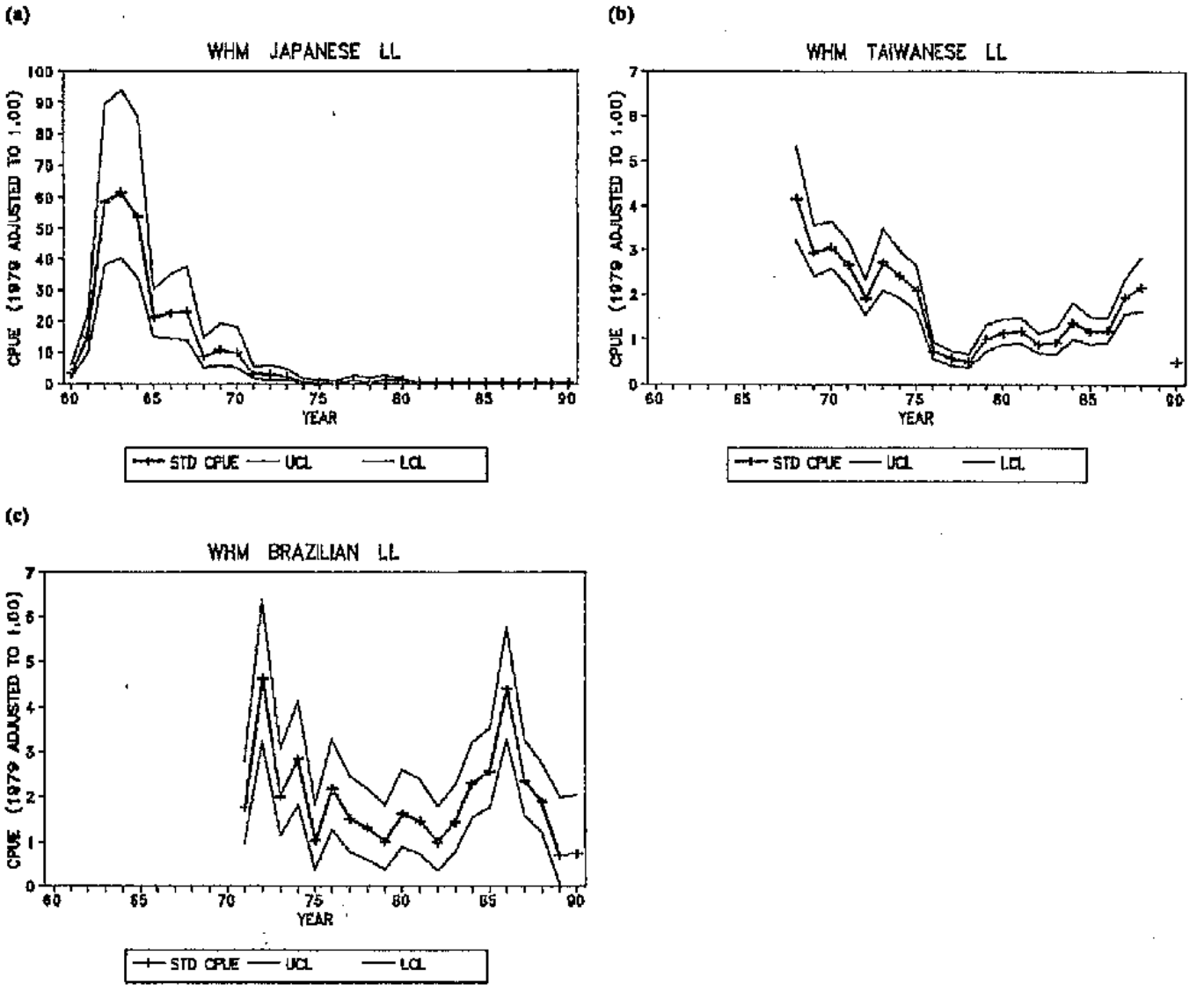
(d) Sensitivity tests for estimated trajectory of F/F_{MSY}



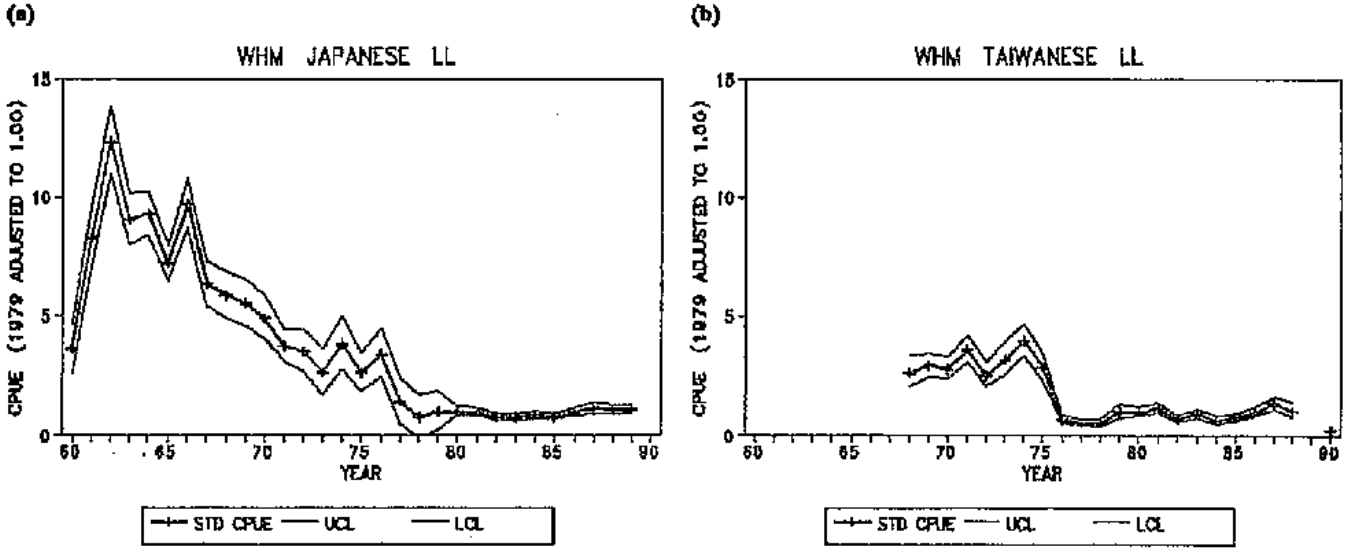
BIL-Fig. 7. Estimated trajectory of B/B_{MSY} and F/F_{MSY} and the sensitivity tests for total Atlantic blue marlin. The first three years have been omitted, as estimates are less precise.



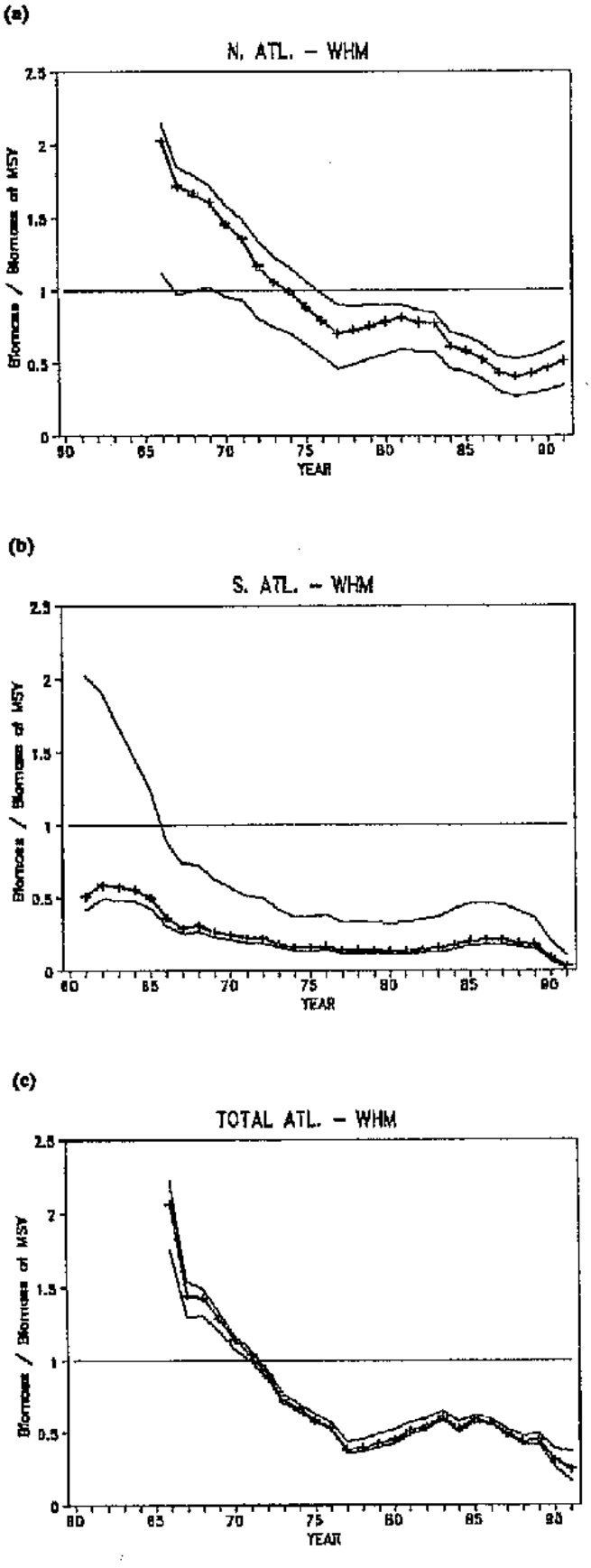
BIL-Fig. 8. Annual standardized mean CPUE's for white marlin from the Japanese longline fishery (a), the Taiwanese longline fishery (b), the Venezuelan recreational fishery (c), and the U.S. recreational fishery (d) for the north Atlantic, with associated approximate 90% confidence bounds. Values are adjusted to 1.00 in 1979 and 1980 in (a) and (b), and values are adjusted to 1.00 in 1973 in (c) and (d).



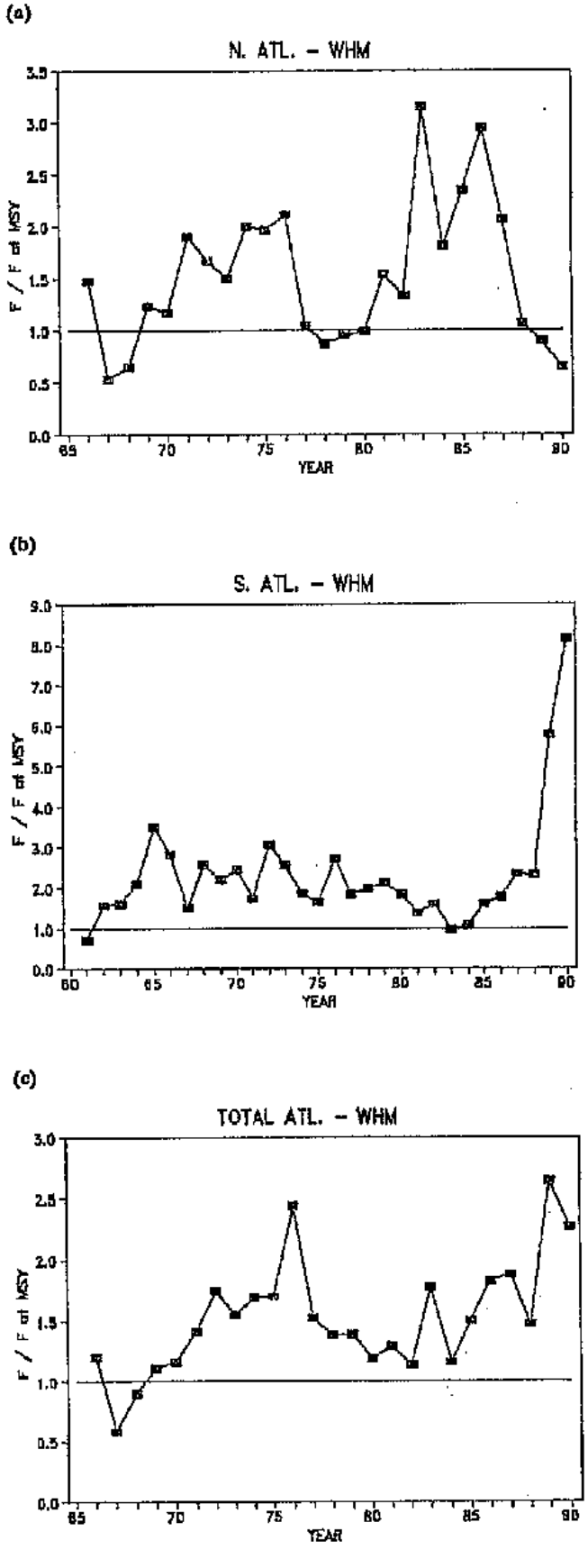
BILL-Fig. 9. Annual standardized mean CPUEs for white marlin from the Japanese (a), Taiwanese (b) and Brazilian (c) longline fisheries for the South Atlantic, with associated approximate 90% confidence bounds. Values are adjusted to 1.00 in 1979 and 1980 in (a), and to 1.00 only in 1979 for (b) and (c).



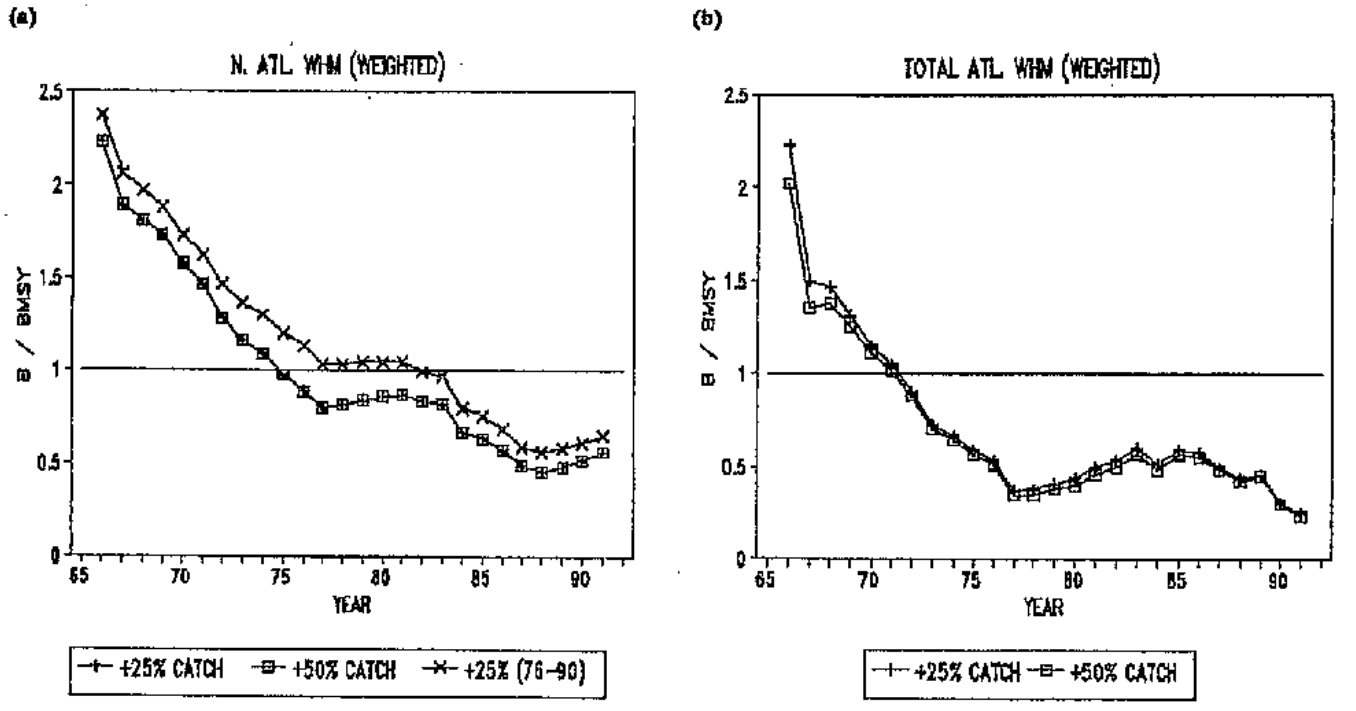
BILL-Fig. 10. Annual standardized mean CPUEs for white marlin from the Japanese (a) and Taiwanese (b) longline fisheries for the total Atlantic, with associated approximate 90% confidence bounds. Values are adjusted to 1.00 in 1979 and 1980.



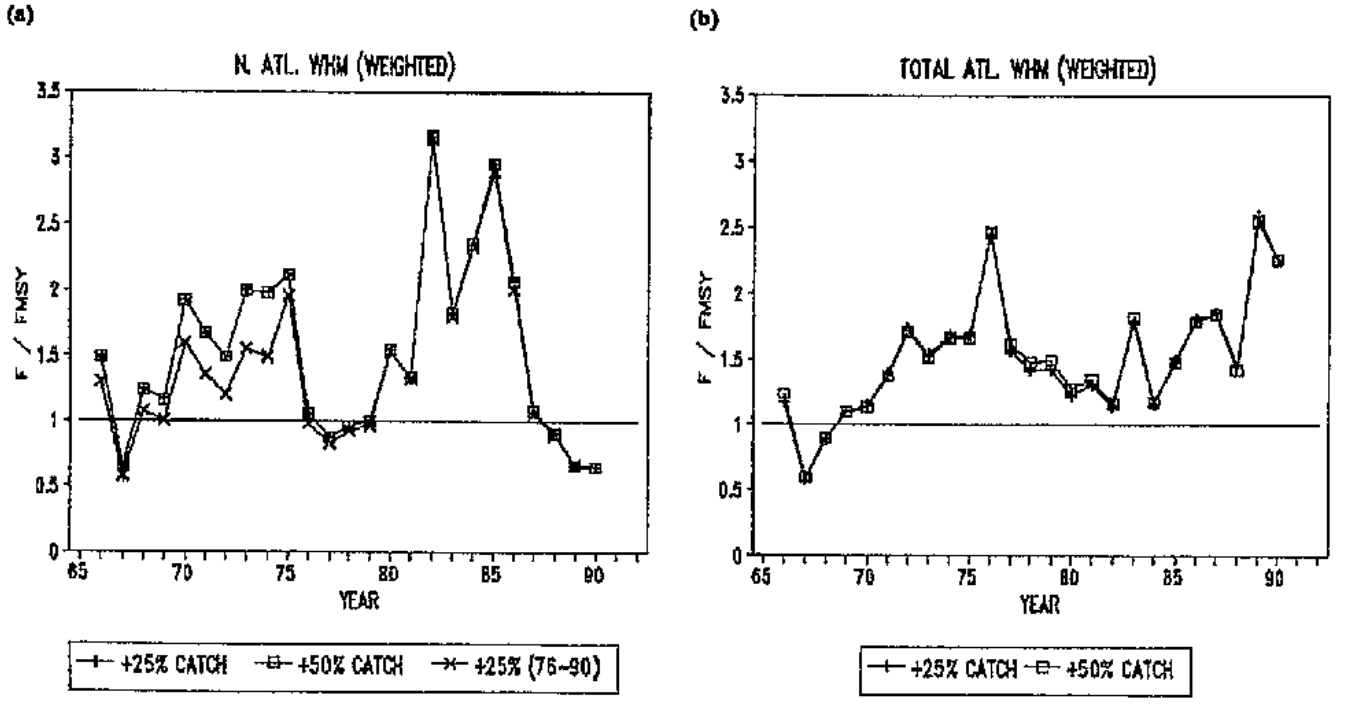
BIL-Fig. 11. Bootstrapped median biomass trajectories with approximate non-parametric 80% intervals for white marlin fisheries from the (a) north Atlantic, (b) south Atlantic, and (c) total Atlantic. Results are imprecise for the first 3 to 5 years of the time series.



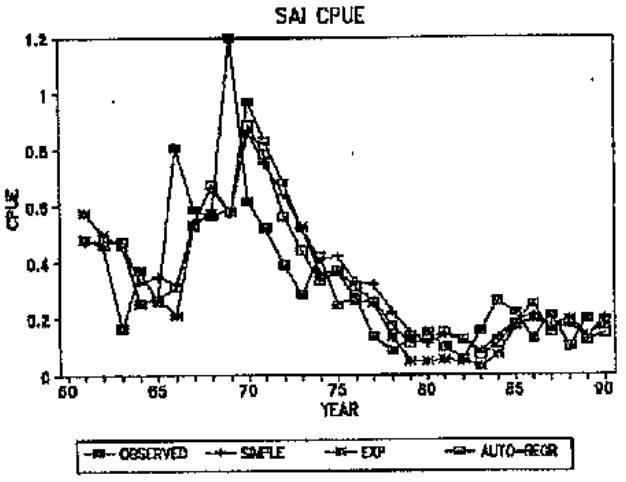
BIL-Fig. 12. Relative fishing mortality trajectories for white marlin from the (a) north Atlantic, (b) south Atlantic, and (c) total Atlantic.



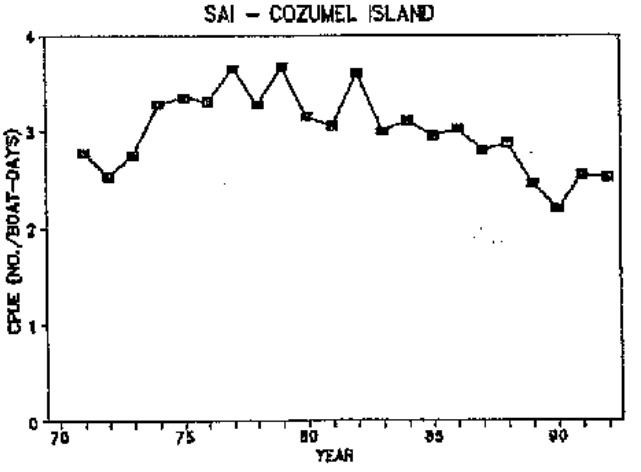
BIL-Fig. 13. Sensitivity tests of estimated trajectory of B/B_{MSY} for white marlin of (a) north Atlantic and (b) total Atlantic. The first three years have been omitted, as estimates are less precise.



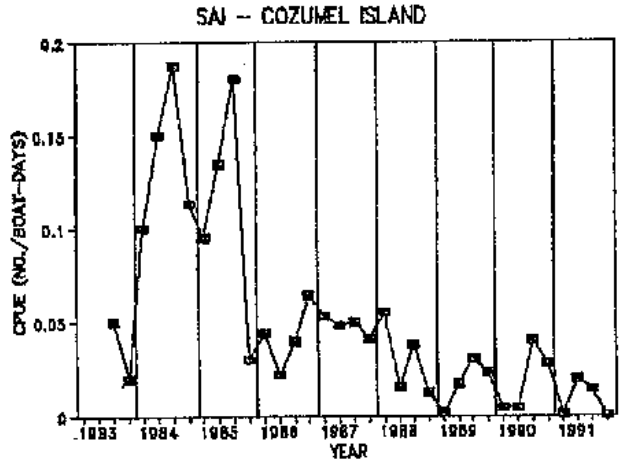
BIL-Fig. 14. Sensitivity tests of estimated trajectory of F/F_{MSY} for white marlin of (a) north Atlantic and (b) total Atlantic.



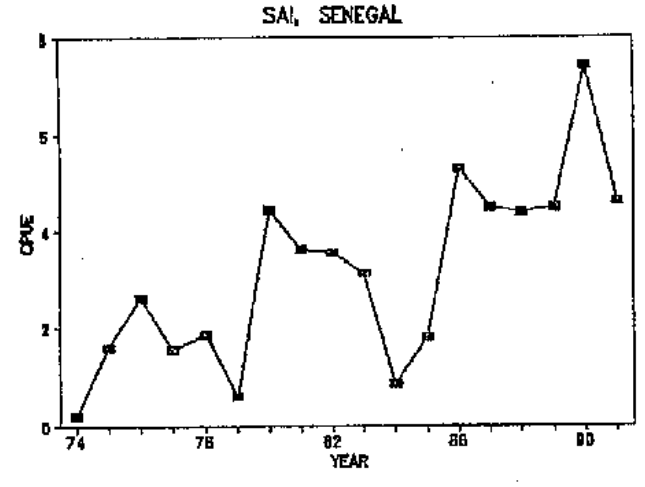
BIL-Fig. 15a. Comparison between simple exponential smoothing, generalized exponential smoothing and auto-regressive fits, for Venezuelan sailfish CPUE.



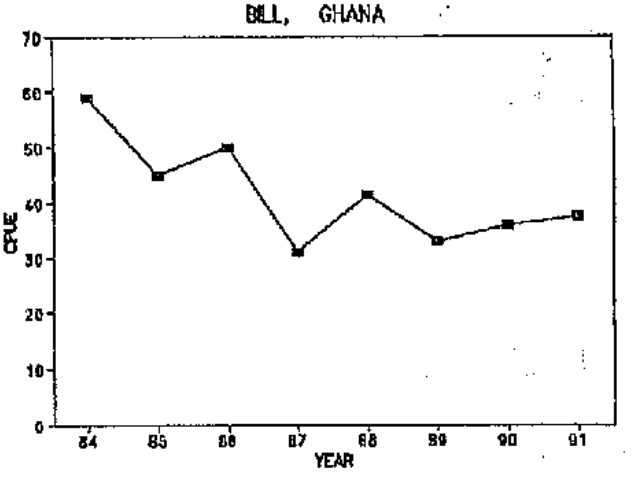
BIL-Fig. 15b. Historical CPUE for sailfish in the spring season in Cozumel Island, Mexico.



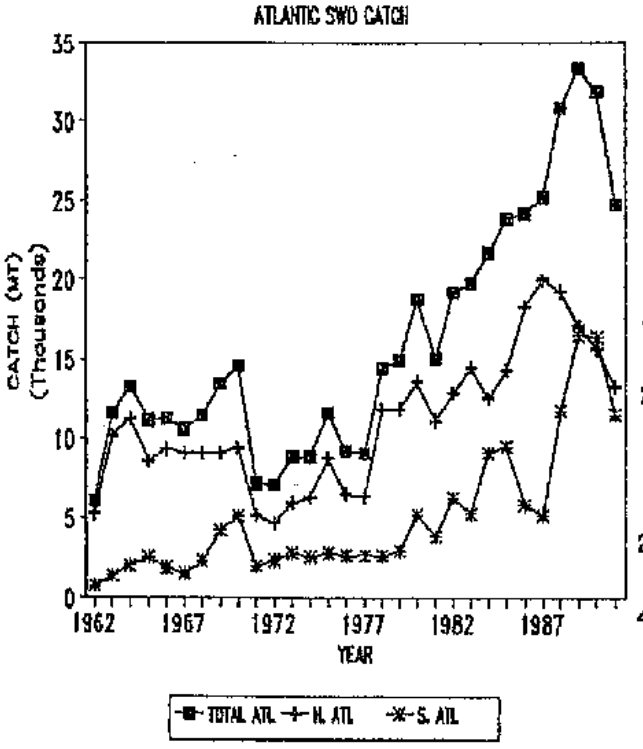
BIL-Fig. 15c. Quarterly mean catch per hundred hooks of sailfish in the southwestern equatorial Atlantic Ocean, from July 1983 to December 1991.



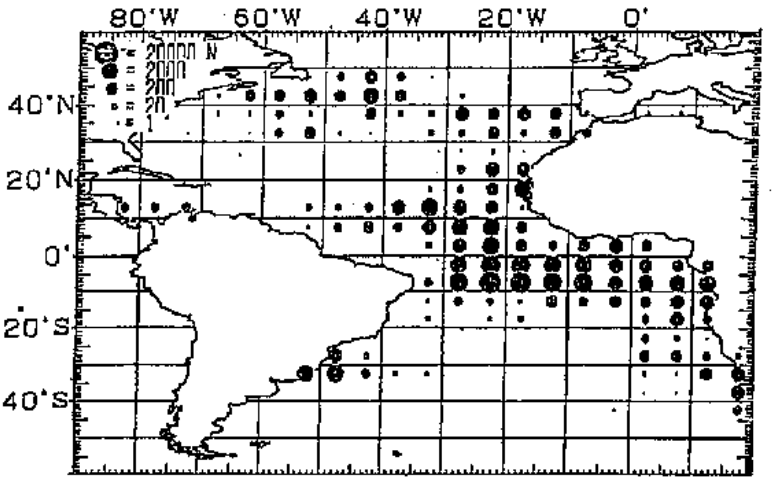
BIL-Fig. 16a. Nominal CPUE's for artisanal fisheries for sailfish from Senegal (1974-1991).



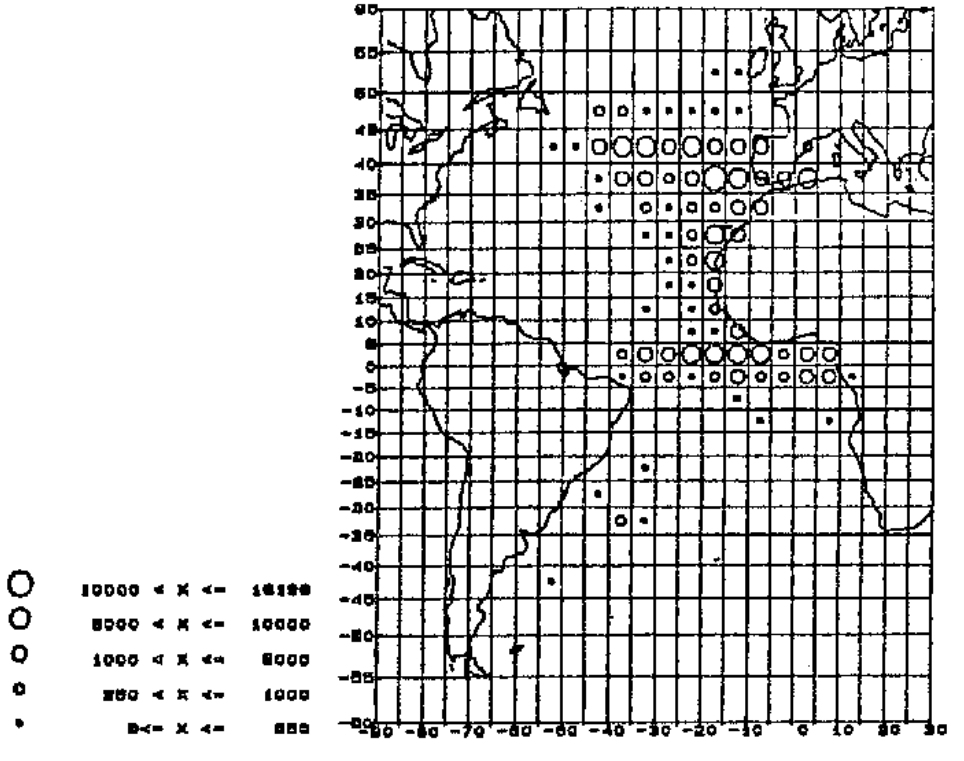
BIL-Fig. 16b. Nominal CPUE's for artisanal fisheries for billfish from Ghana (1984-1991). Sailfish represent over 80% of the billfish catch.



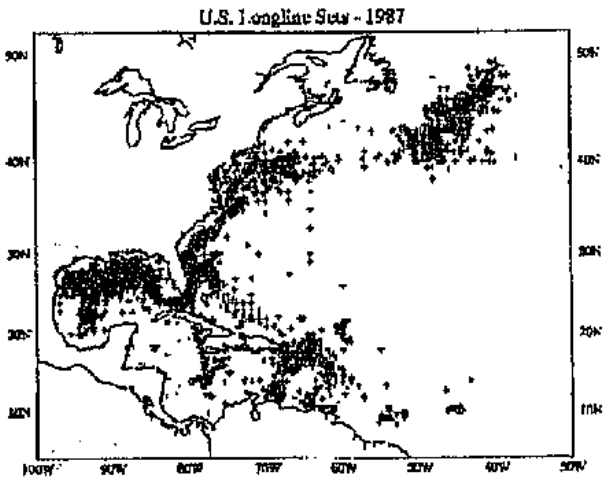
SWO-Fig. 1. Annual nominal catches of swordfish in the Atlantic.

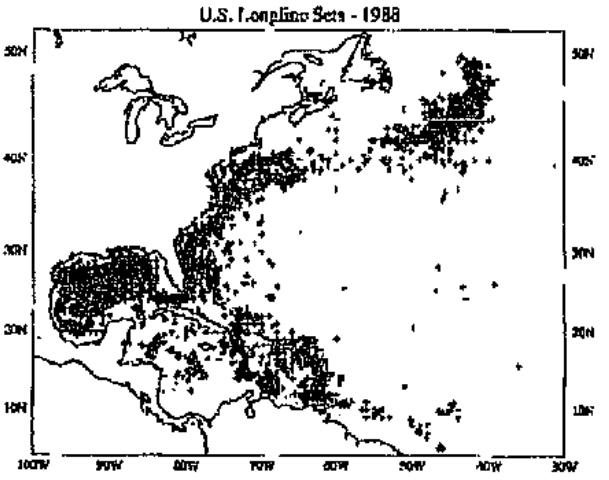


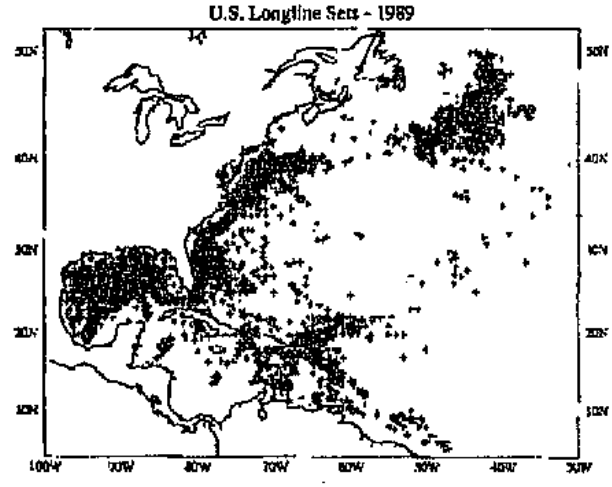
SWO-Fig. 2. Distribution of the Japanese longline catch (in number) by 5x5 degree rectangles in 1991. Data are provisional and presented as catch rather than effort as this is a by-catch fishery.

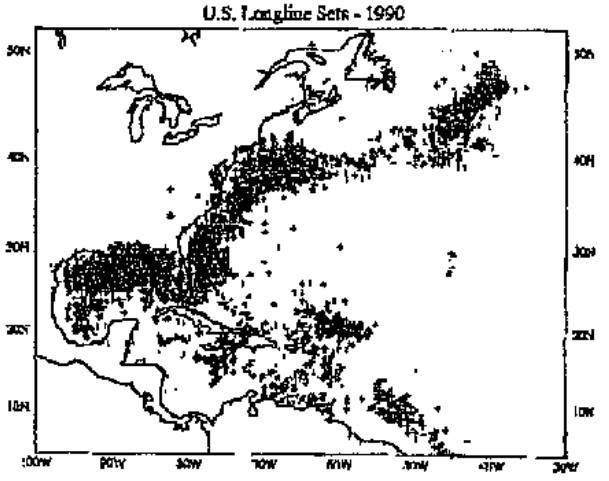


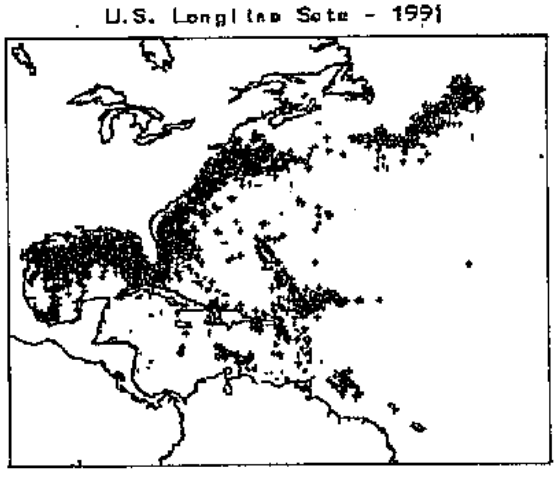
SWO-Fig. 3. Fishing effort by 5x5 degree rectangles (in thousands of hooks) by the Spanish fleet in the Atlantic for the 1988-91 period.



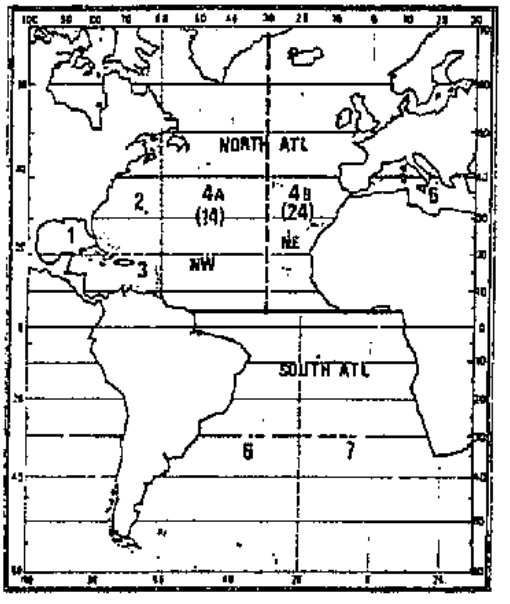




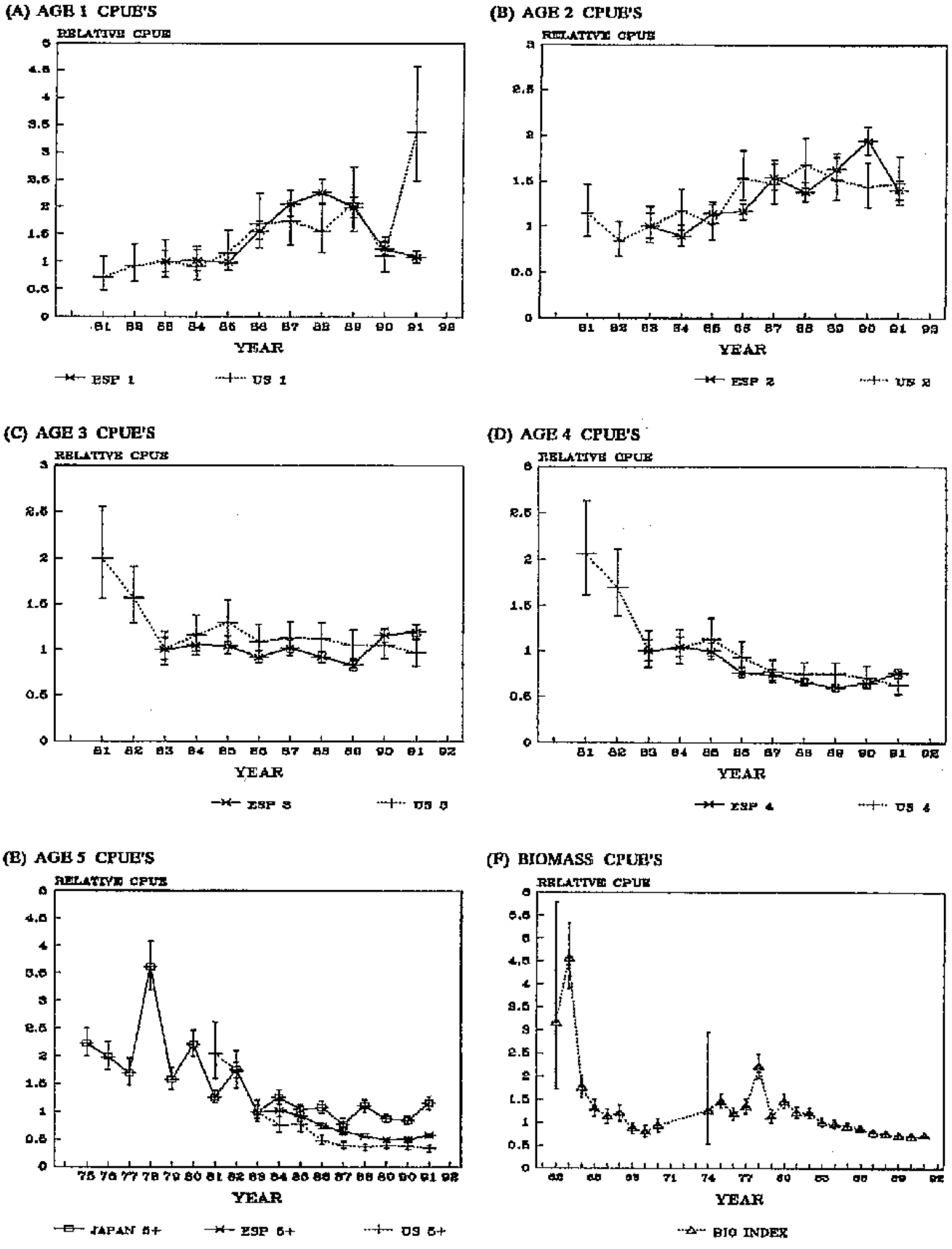




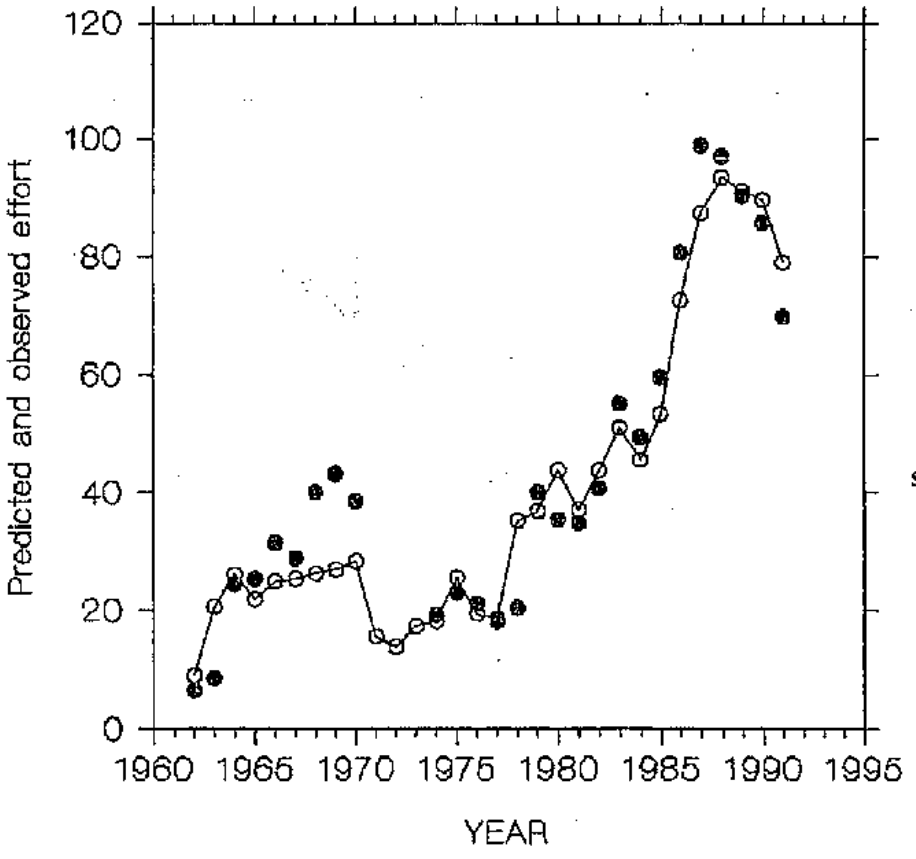
SWO-Fig. 4. U.S. swordfish longline set positions, 1987-1991.



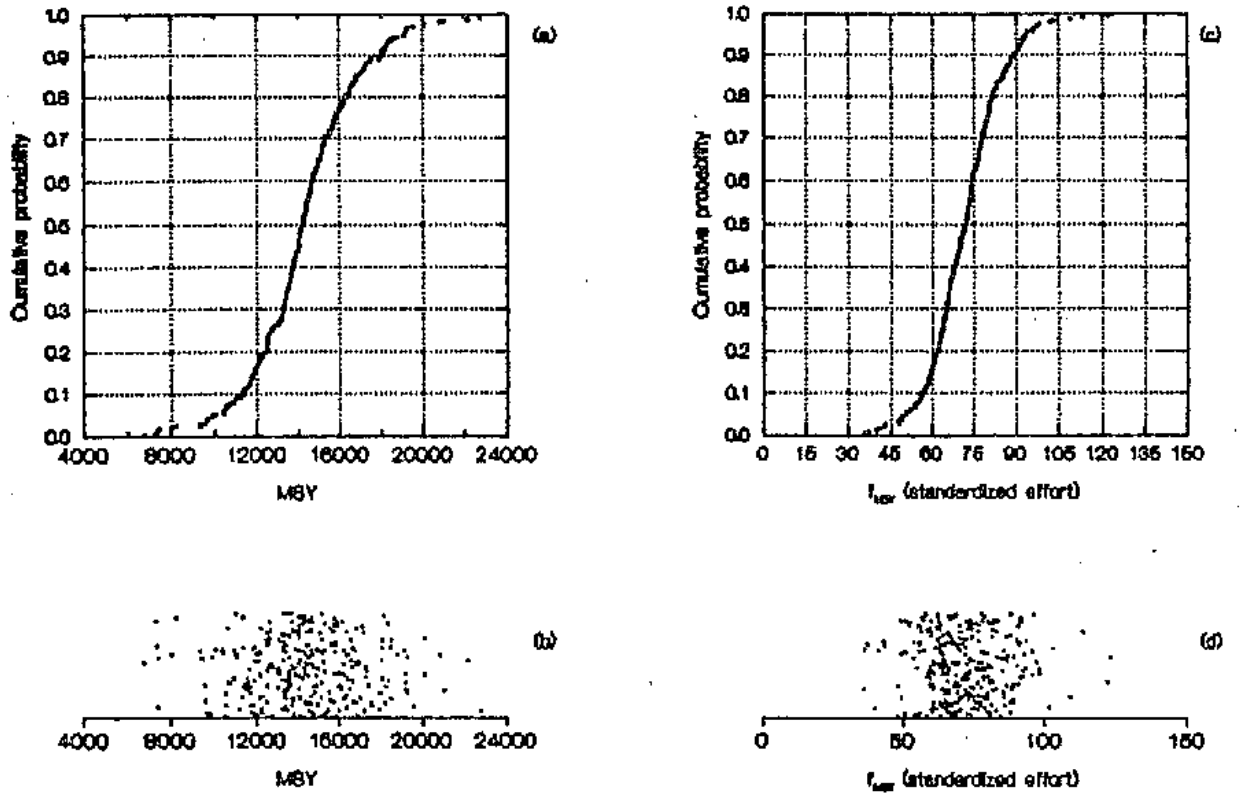
SWO-Fig. 5. Swordfish sampling areas (shown by numbers) and scenarios for swordfish stocks.



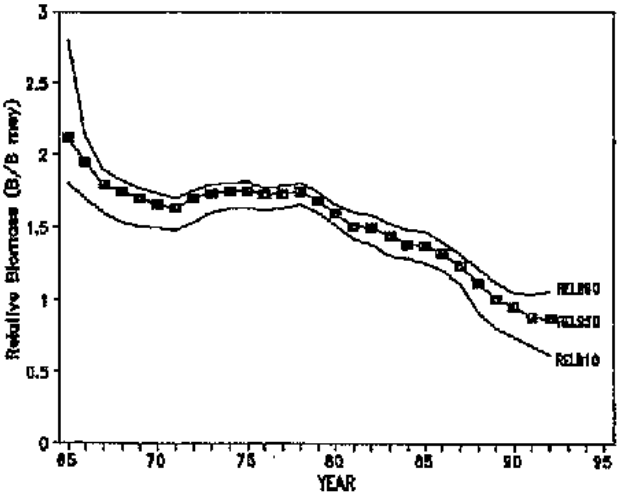
SWO-Figure 6. Standardized indices of age-specific abundance from the US, Spanish (ESP) and Japanese (JPN) longline fleets operating in the North Atlantic Ocean. Biomass abundance index from US, Canadian, Japanese, and Spanish fleets.



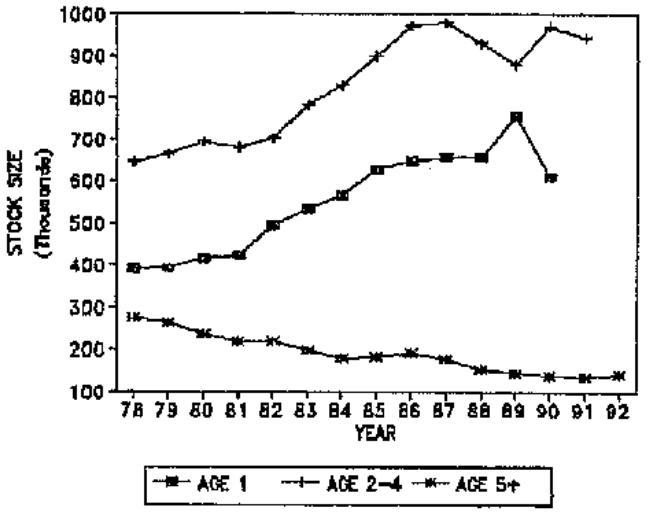
SWO-Fig. 7. Predicted (open circles) and observed (filled circles) fishing effort for swordfish in the north Atlantic. Predictions are estimated values from the base-case non-equilibrium production model (ASPIC) analysis with residuals accumulated in the logarithm of effort. Data are in million hooks and were derived from SCRS/92/28. No observed effort data were available for 1971-1973.



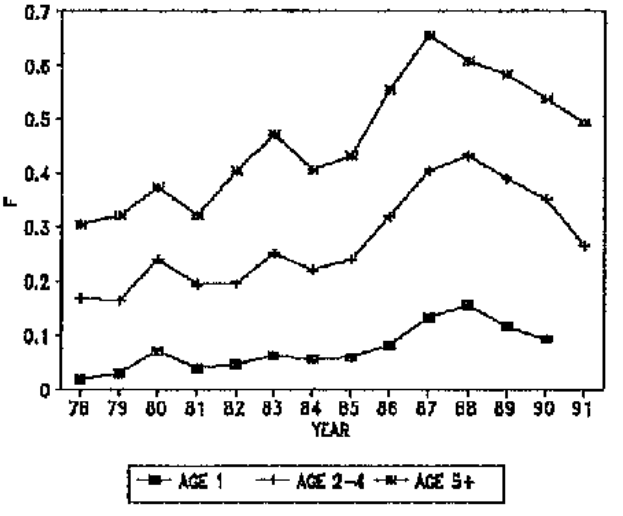
SWO-Fig. 8. Nonparametric distributions of maximum sustainable yield (MSY) and standardized optimum effort (f_{MSY}) for swordfish in the North Atlantic. Results are from the base-case bootstrapped dynamic production model analysis with 300 realizations. Panel (a), cumulative probability distribution of MSY. Panel (b), distribution (density) of estimates of MSY. Each dot represents one realization of the bootstrap. The vertical position of the dots is random, and is used only to avoid overlapping symbols. Panel (c), cumulative probability distribution of f_{MSY}; panel (d) distribution (density) of estimates of f_{MSY}.



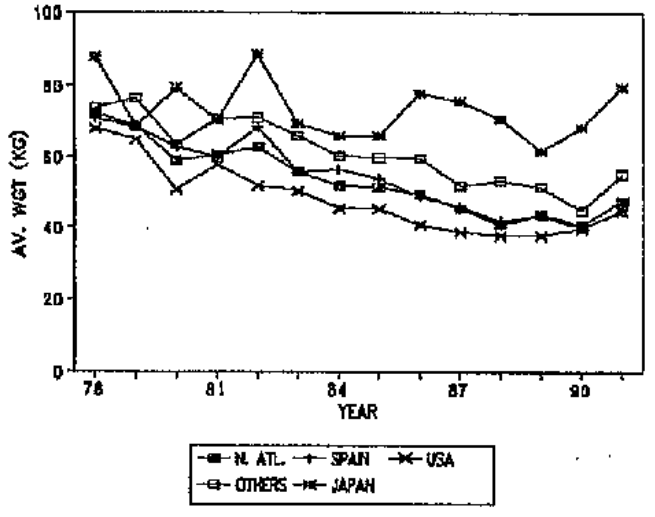
SWO-Fig. 9. Non-parametric 90% confidence band (with median) of estimated start-of-year stock biomass (MT) of swordfish in the North Atlantic. Results are from the base-case bootstrapped dynamic production model with 300 trials. To increase precision, plotted biomass estimates were normalized to corresponding estimates of B_{MSY}, thus providing a consistent reference point. Each point represents the median (or respective percentile) for that year from all bootstrap trials. They are joined to produce a synthetic median (or percentile) trajectory. In all cases, an approximate adjustment for bias has been applied.



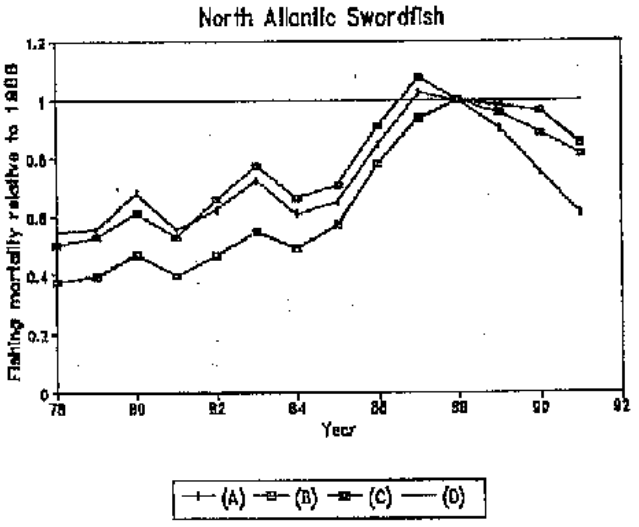
SWO-Fig. 10. North Atlantic swordfish stock size (number of fish) at the beginning of the year by age category, estimated by the accepted VPA.



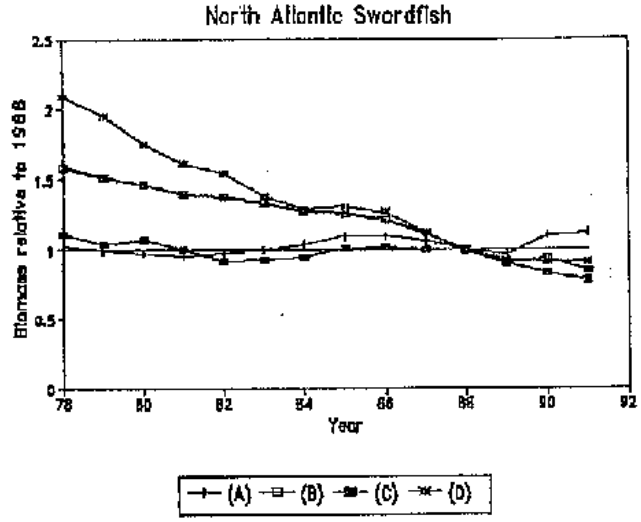
SWO-Fig. 11. North Atlantic swordfish fishing mortality rate during the year by age category, as provided by the accepted VPA.



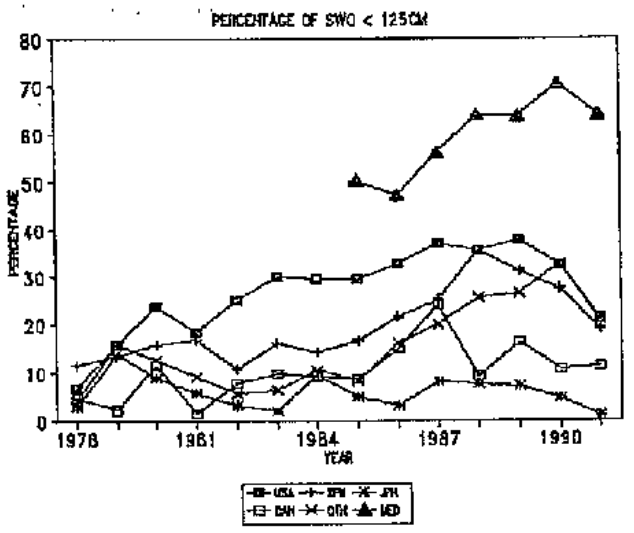
SWO-Fig. 12. Average weights of swordfish in the north Atlantic.



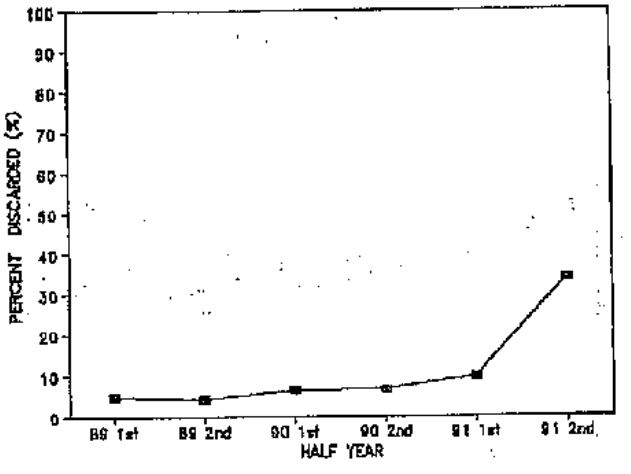
SWO-Fig. 13. Comparison of fishing mortality estimates for North Atlantic swordfish obtained with the base VPA and non-equilibrium production model analyses. Values are given relative to 1988. Because the VPA and production model estimates are not directly comparable, several estimates are presented:
(A) = VPA F on total biomass (total yield divided by total biomass for ages 0+).
(B) = Production model F.
(C) = VPA F on fishable biomass (total yield divided by fishable biomass as in SWO-Fig. 9).
(D) = VPA F on age 5+ biomass (yield for ages 5+ divided by age 5+ biomass)
Lines (C) and (D) coincided.



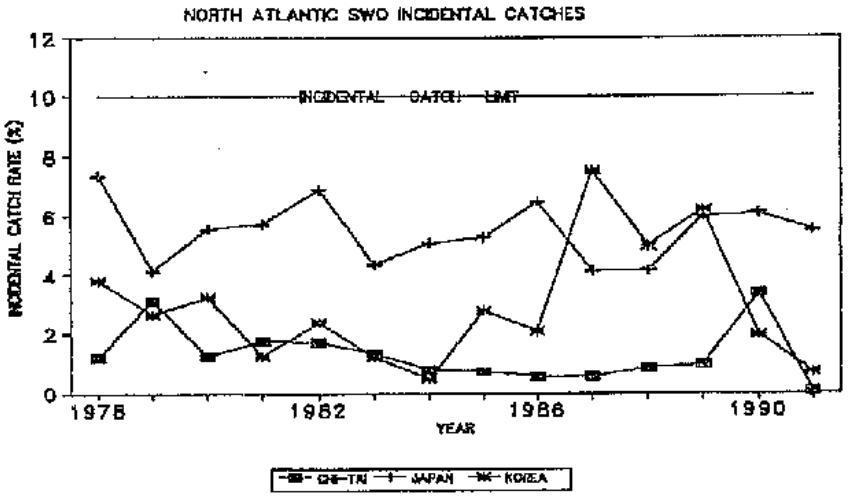
SWO-Fig. 14. Comparison of biomass estimates for North Atlantic swordfish obtained with the base VPA and non-equilibrium production model analyses. Values are given relative to 1988. Because the VPA and production model estimates are not directly comparable, several estimates are presented:
(A) = VPA total biomass for ages 0+.
(B) = Production model biomass.
(C) = VPA fishable biomass (sum of age-specific biomass multiplied by their selectivity to fishing).
(D) = VPA biomass for ages 5+.



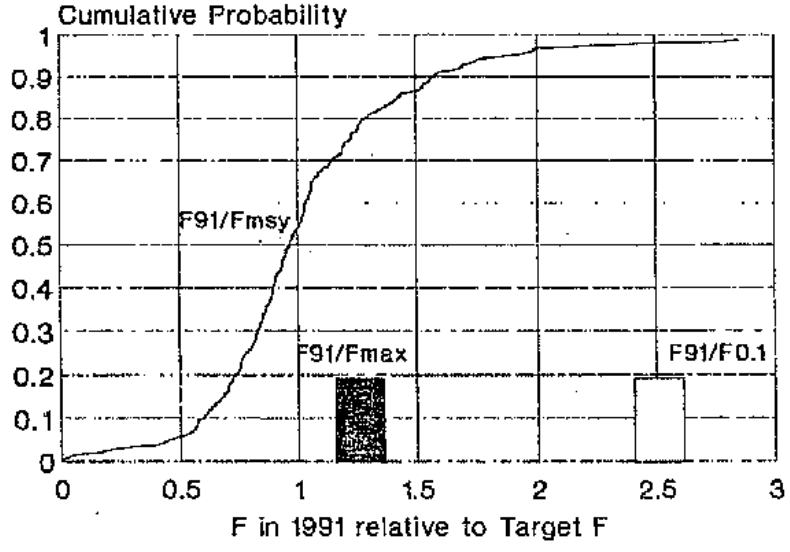
SWO-Fig. 15. Percentage of under-sized swordfish (less than 125 cm in lower-jaw fork length) in the catches of the major fishing fleets for the north Atlantic.



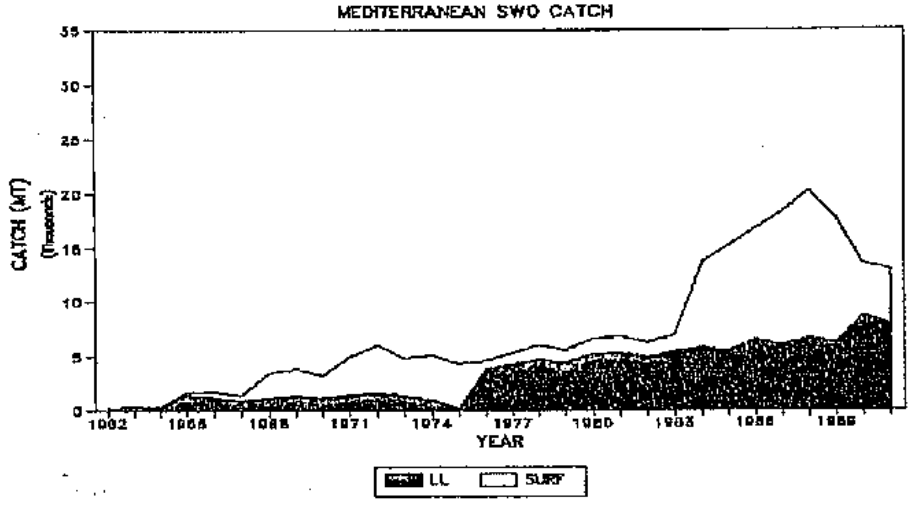
SWO-Fig. 16. Reported percent swordfish discarded in the U.S. fleet from mandatory pelagic logbook data base for each half year from 1989 to 1991.



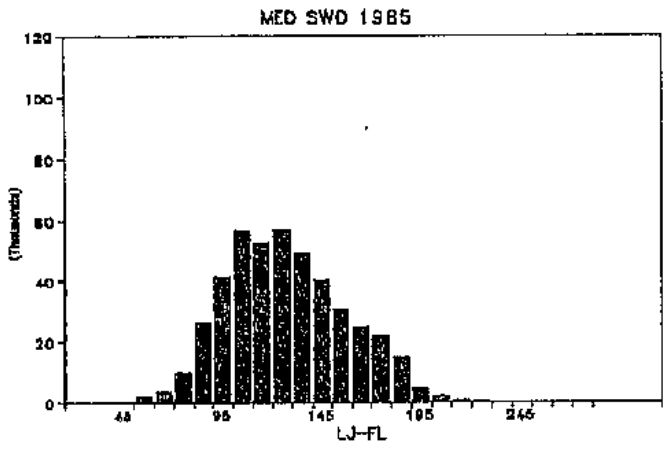
SWO-Fig. 17. Estimated incidental catch rate of swordfish (in MT) in the major north Atlantic longline fisheries, which do not have direct effort to swordfish.

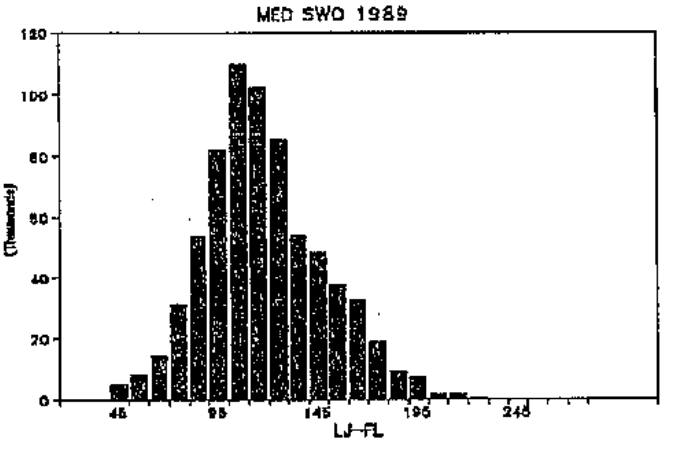


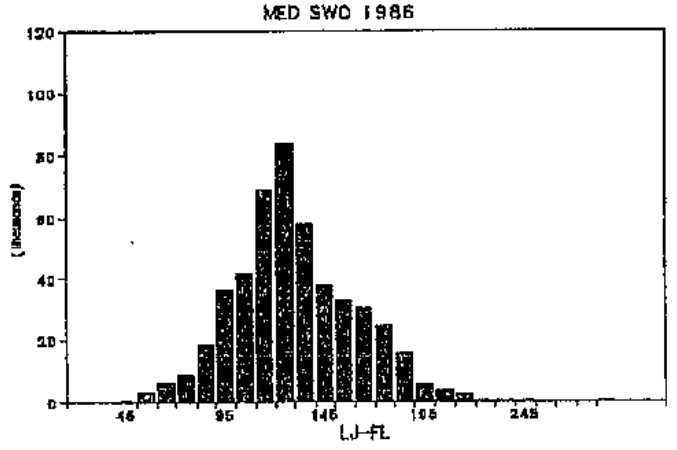
SWO-Fig. 18. Estimates of terminal year (1991) fishing mortality relative to selected reference targets. The curved line shows that the cumulative probability distribution of bootstrap estimates relative to F_{MSY} from the base-case non-equilibrium production model fit. The two bars represent approximate ranges of the VPA-based estimates for F relative to F_{MAX} and $F_{0.1}$. The height of these bars is not associated with any likelihood. The lower values for these VPA-based ranges were obtained assuming a 1991 selectivity pattern; the higher values assume an average selectivity for the 1989–91 period for ages 0-4.

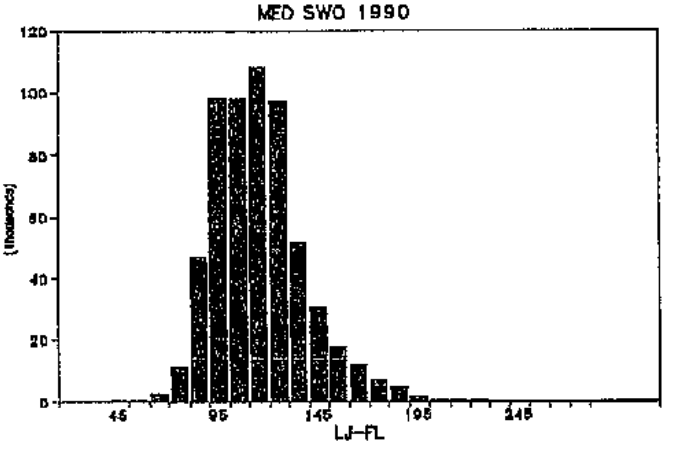


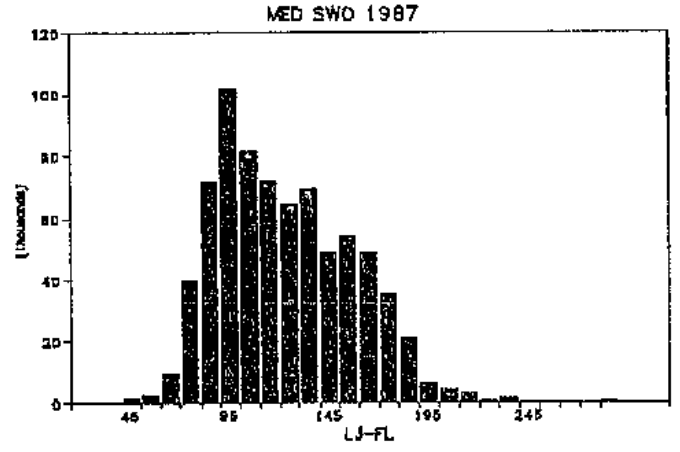
SWO-Fig. 19. Accumulative swordfish catches by gear in the Mediterranean Sea.

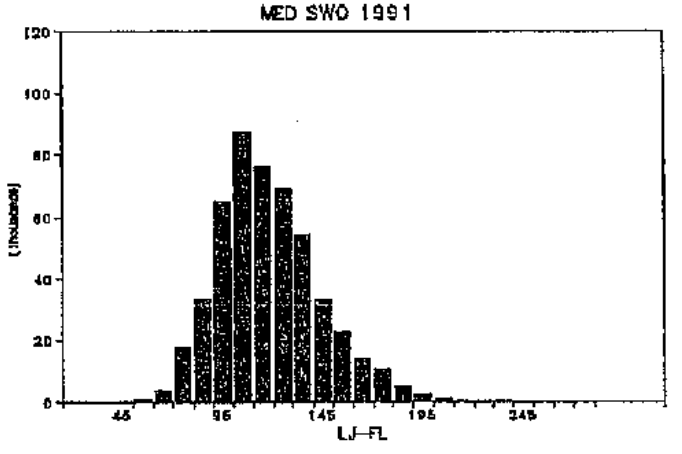


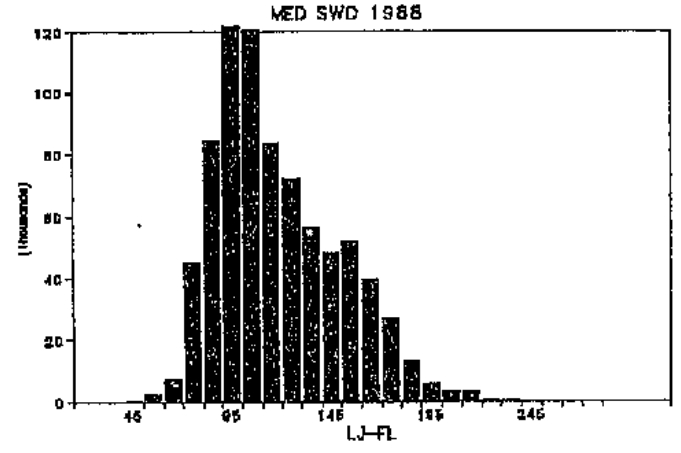




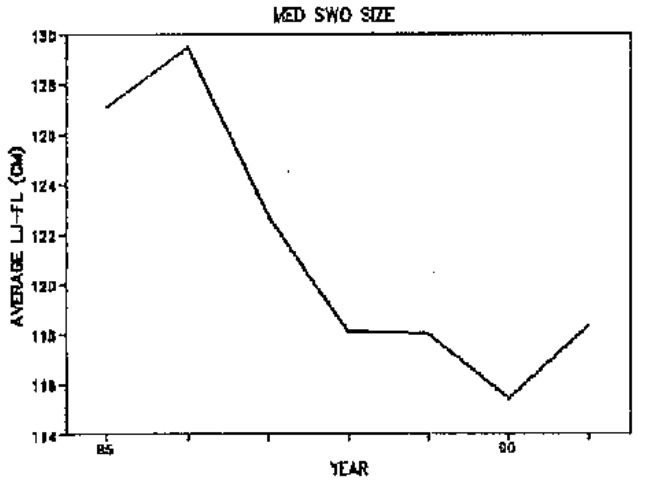




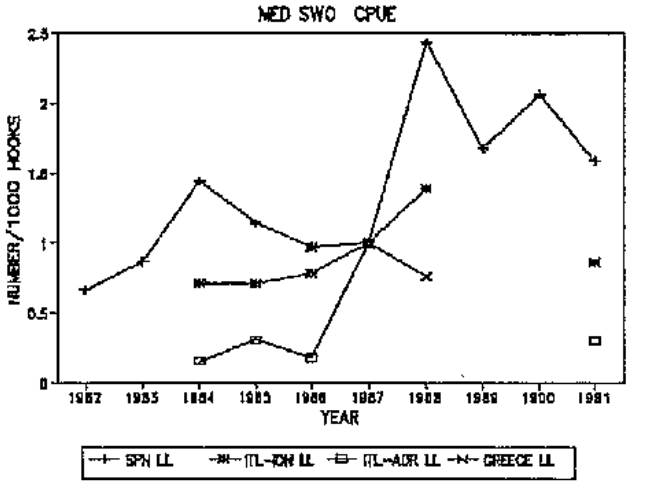




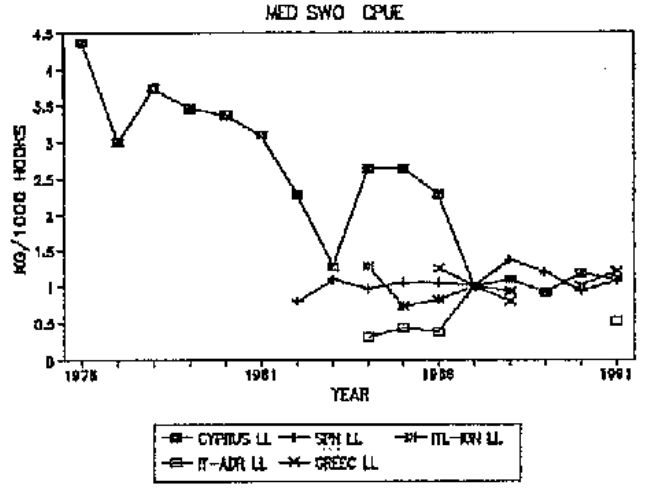
SWO-Fig. 20. Annual catch-at-size frequencies of Mediterranean swordfish for all the gears and countries combined.



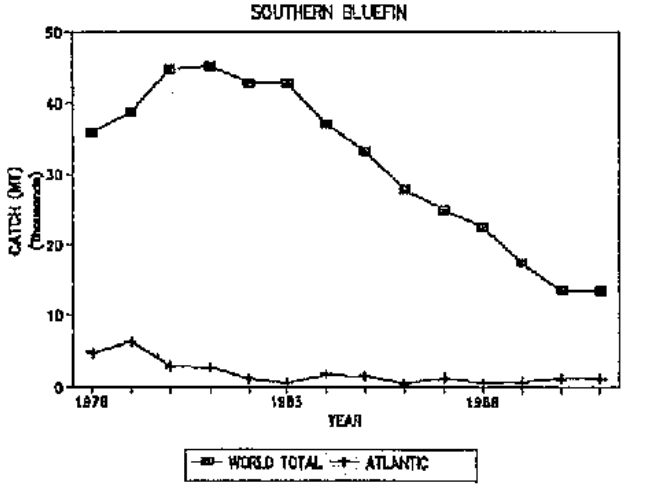
SWO-Fig. 21. Annual average size (lower-jaw fork length) of Mediterranean swordfish.



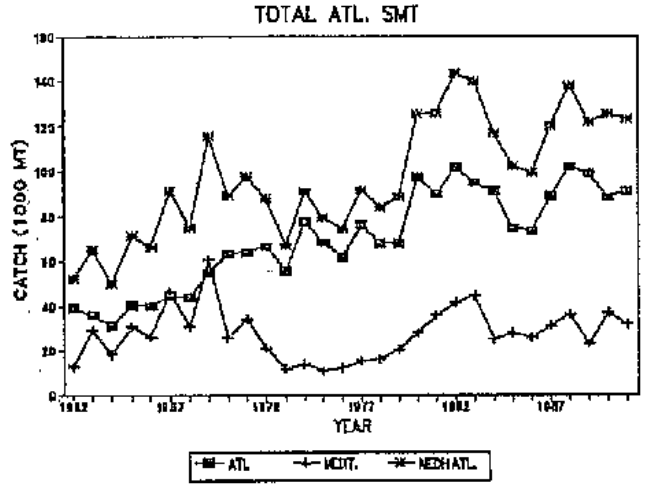
SWO-Fig. 22. Relative catch-per-unit-effort (in number of fish) for the Mediterranean swordfish fisheries (adjusted 1987=1).



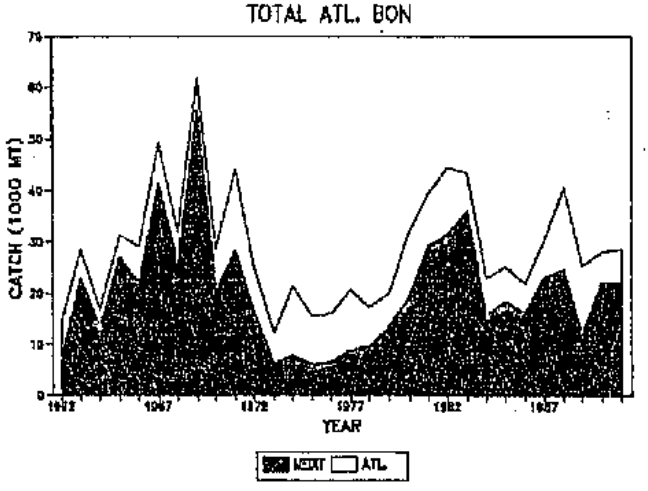
SWO-Fig. 23. Relative catch-per-unit-effort (in weight) for the Mediterranean swordfish fisheries (adjusted 1987=1).



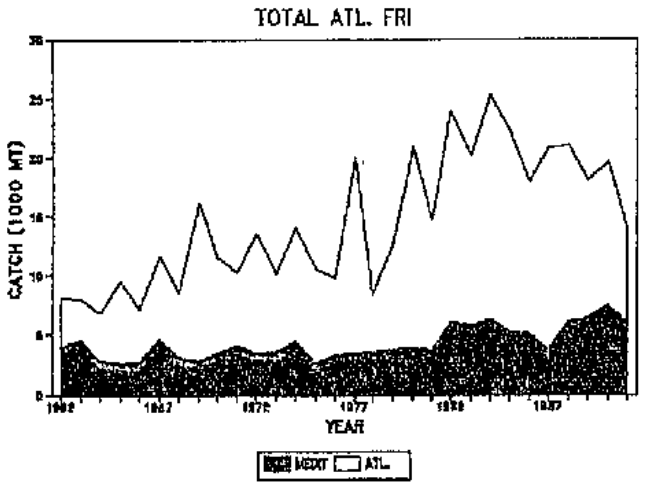
SBF-Fig. 1. World and Atlantic catches (in MT) of southern bluefin tuna.



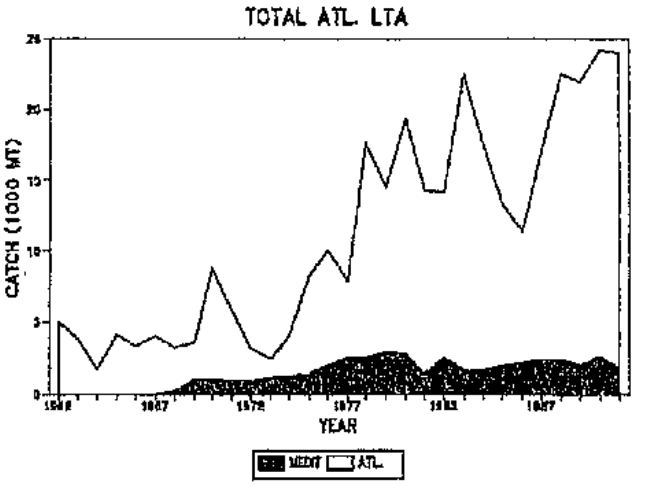
SMT-Fig. 1 Total Atlantic and Mediterranean small tuna catches (in 1000 MT).



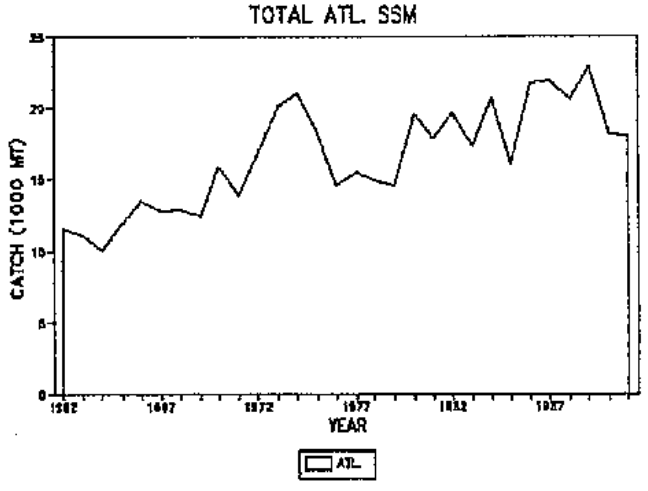
SMT-Fig. 2. Total Atlantic and Mediterranean bonito catches (in 1000 MT).



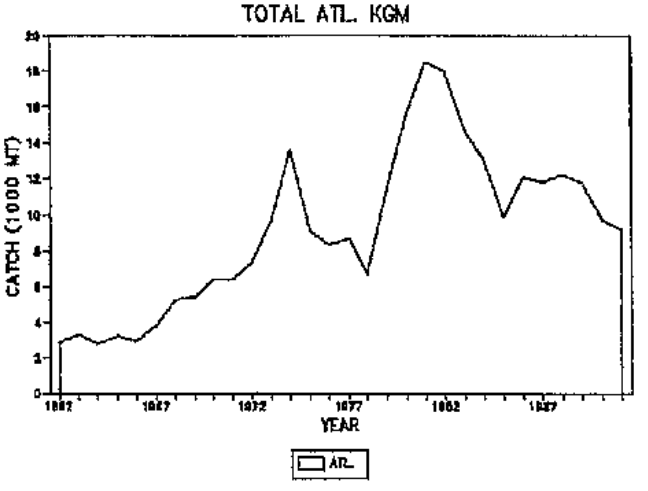
SMT-Fig. 3. Total Atlantic and Mediterranean frigate tuna catches (in 1000 MT).



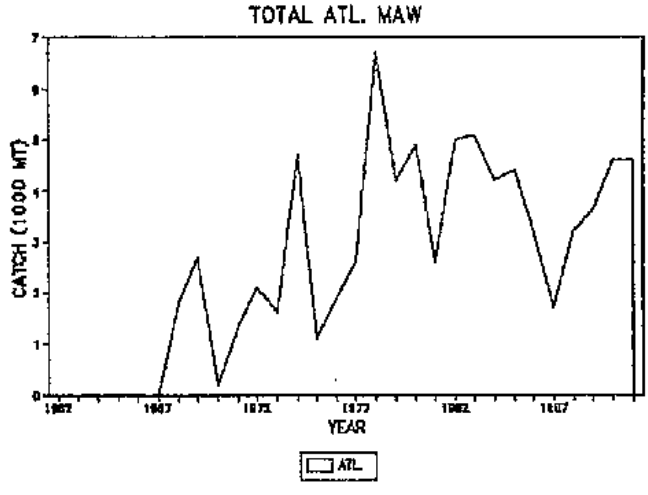
SMT-Fig. 4 Total Atlantic and Mediterranean black skipjack catches (in 1000 MT).



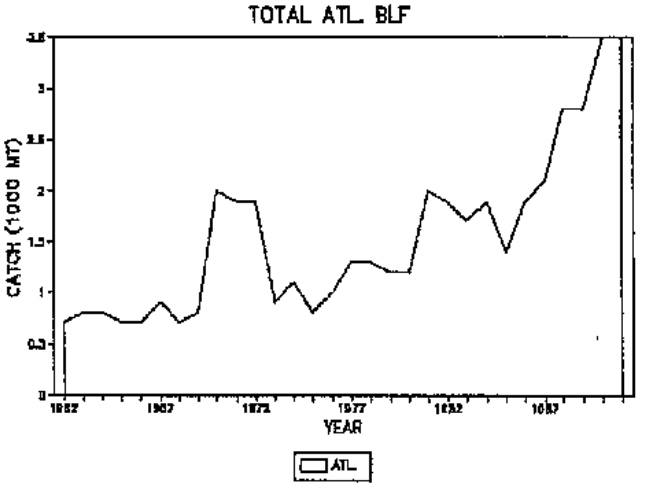
SMT-Fig. 5 Total Atlantic spotted Spanish mackerel catches (in 1000 MT).



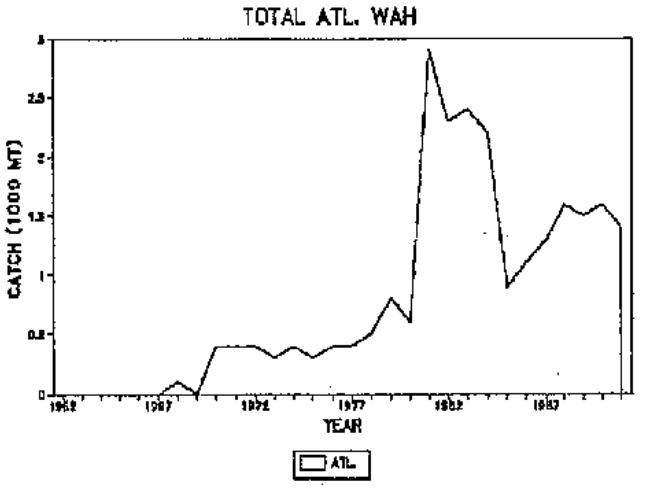
SMT-Fig. 6. Total Atlantic king mackerel catches (in 1000 MT).



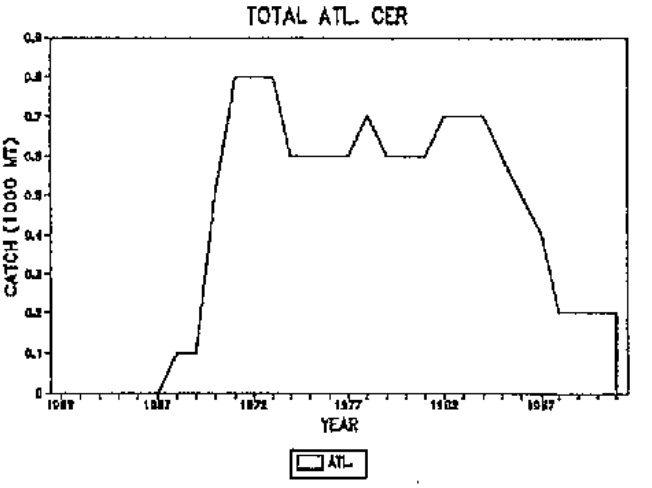
SMT-Fig. 7. Total Atlantic West African Spanish mackerel catches (in 1000 MT).



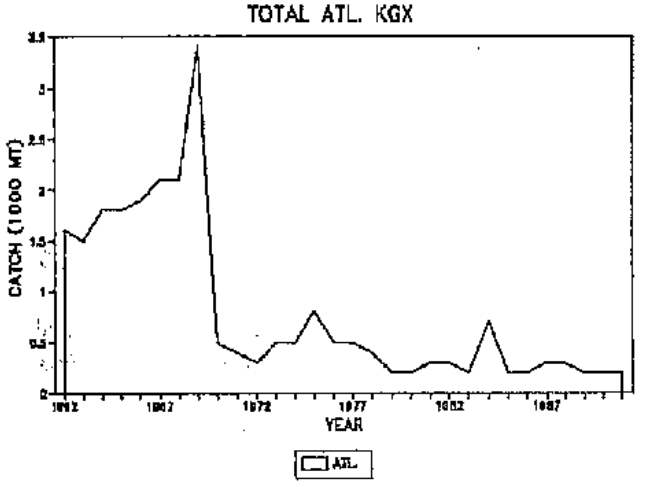
SMT-Fig. 8. Total Atlantic blackfin tuna catches (in 1000 MT).



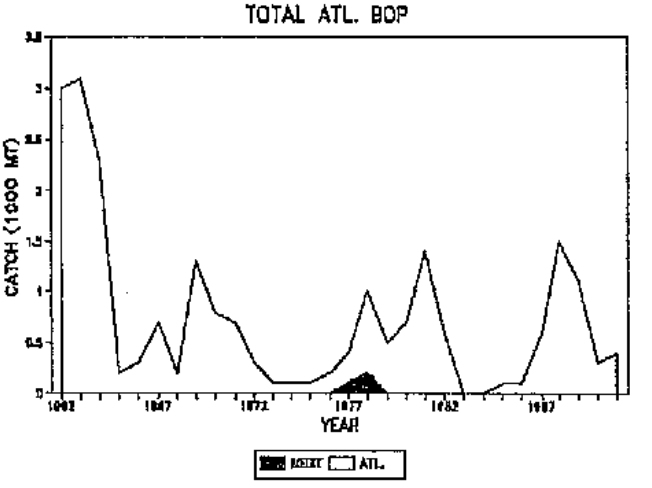
SMT-Fig. 9. Total Atlantic wahoo catches (in 1000 MT).



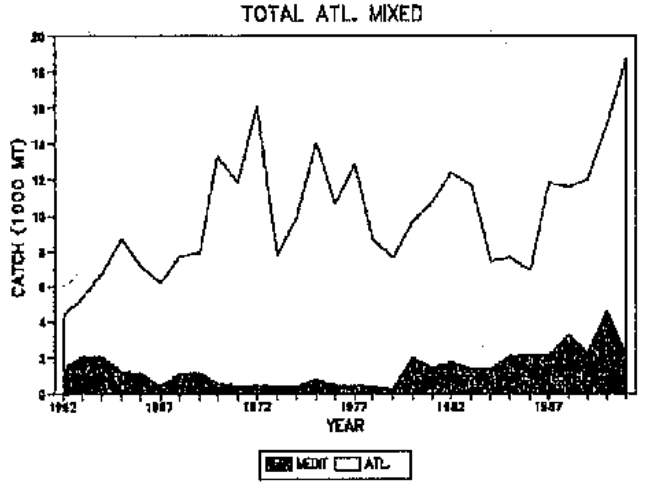
SMT-Fig. 10. Total Atlantic cero mackerel catches (in 1000 MT).



SMT-Fig. 11. Total Atlantic unclassified Spanish mackerel catches (in 1000 MT).



SMT-Fig. 12. Total Atlantic and Mediterranean plain bonito catches (in 1000 MT).



SMT-Fig. 13. Total Atlantic and Mediterranean mixed species catches (in 1000 MT).

Appendix 1 to Annex 14

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

1. Opening of the meeting
2. Adoption of Agenda and arrangements for the meeting
3. Introduction of delegations
4. Admission of observers
5. Admission of scientific documents
6. Review of national fisheries and research programs
7. Reports of 1992 inter-sessional scientific meetings
   - -- Data Preparatory Meeting for the South-western Atlantic (Recife, Brazil - July, 1992)
   - -- CWP Meeting (Halifax, Nova Scotia, Canada -July, 1992)
   - -- Billfish Workshop (Miami, Florida, U.S.A. - July, 1992)
   - -- Second GFCM/ICCAT Joint Consultation (Iraklion, Crete, Greece - September, 1992)
8. Report of the results of the CITES Conference (Kyoto, Japan - March, 1992)
9. Review of the progress made by the Albacore Research Program
10. Review of the progress made by the Program of Enhanced Research for Billfish
11. Review of the progress made by the Bluefin Year Program
12. Review of conditions of stocks:

    YFT-Yellowfin
    BET-Bigeye
    SKJ-Skipjack
    ALB-Albacore
    BFT-Bluefin
    BIL-Billfishes
    SWO-Swordfish
    SBF-Southern Bluefin
    SMT-Small Tunas
    MLT-Multi-species: Tropical and Temperate

13. Report of Sub-Committee on Environment
    - -- Anomalies in oceanic conditions in recent years
    - -- Ecology of tunas (association with floating objects, with other marine animals, gear selectivity, species interactions, by-catches, etc.)
    - -- Review of studies on the effect of the environment on tuna ecology and the conclusions of various international meetings on the environment
14. Management and responsible fishing
    - -- International Conference on Responsible Fishing (Cancun, Mexico -May 6-8, 1992)
    - -- FAO Technical Consultation on High Seas Fishing (Rome, September 7-15, 1992)
15. Report of the Sub-Committee on Statistics and review of Atlantic tuna statistics and data management system
    - -- Review of national statistics
    - -- The Secretariat's statistical work in 1992
    - -- Problems of unreported catches by non-Contracting Parties
    - -- Progress made on recommendations for statistics (as contained in the 1991 SCRS Report), and future plans
16. Progress made in the collection of information on sharks
17. Review of ICCAT publications
18. Review of future SCRS activities
    - -- Organization of the SCRS sessions
    - -- Inter-sessional scientific meetings in 1993
    - -- Other matters
19. Cooperation with non-Contracting Parties and other organizations
20. Date and place of the next meeting of the SCRS
21. Other matters
22. Adoption of Report
23. Adjournment

Appendix 2 to Annex 14

LIST OF SCRS PARTICIPANTS

Member countries

BRAZIL

AGUIAR VILARINHO, L.E. *
Segundo Secretario
Embajada de Brasil
C/Fernando el Santo, 6
28010 Madrid (Spain)

MENESES DE LIMA, J.H.
CEPENE/IBAMA
Rua Samuel Hardman s/n
55578 Tamandare, Pernambuco

PEDROSO, L.E.
Segundo Secretario
Embajada de Brasil
C/Fernando el Santo, 6
28010 Madrid (Spain)

ROSANGELA LESSA, P.
Universidade Federal de Pernambuco
Departamento de Pesca
Avda. Don Manuel Medeiros s/n
Dois Irmaos
52071 Recife, Pernambuco

CANADA

Haist, V. *
Pacific Biological Station
Hammond Bay Road
Nanaimo, British Columbia

PORTER, J. *
St. Andrews Biological Station
Department of Fisheries & Oceans
St. Andrews, New Brunswick E0G 2X0

COTE D'IVOIRE

AMON KOTHIAS, J.B.
Directeur
Centre de Recherches
Océanologiques
B.P. V-18
Abidjan

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

FRANCE

ANTOINE, L.
IFREMER
B.P. 70
29280 Plouzané

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

LIORZOU, B.
IFREMER
1 rue Jean Vilar
34200 Sète

STRETTA, J.M.
ORSTOM
B.P. 5045
Montpellier Cédex 01

---

* Attended the Swordfish Stock Assessment Session (Madrid, September 28,-October 3), but not the SCRS Meeting in November, 1992.
** Attended the Albacore Stock Assessment Session (Madrid, October 10-17), but not the SCRS Meeting in November, 1992.

GHANA

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

GUINEA (Rep. of)

KOUROUMA, M.
Direction Nationale de la Pêche
et Aquaculture
Ministère de l'Agriculture et des
Ressources Animales
B.P. 296
Conakry

JAPAN

HIRAMATSU, K.
National Research Institute
of Far Seas Fisheries
5-7-1 Orido
Shimizu-shi, Shizuoka 424

MIYABE, N.
National Research Institute of Far Seas Fisheries
5-7-1 Orido
Shimizu-shi, Shizuoka 424

NAKANO, H. *
National Research Institute of Far Seas Fisheries
5-7-1 Orido
Shimizu-shi, Shizuoka 424

OZAKI, E.
Federation of Japan Tuna Fisheries
Cooperative Associations
2-3-22 Kudankita, Chiyoda-Ku
Tokyo 102

SUDA, A.
Federation of Japan Tuna Fisheries
Cooperative Associations
2-3-22 Kudankita, Chiyoda-Ku
Tokyo 102

SUZUKI, Z.
National Research Institute
of Far Seas Fisheries
5-7-1 Orido
Shimizu-shi, Shizuoka 424

UOZUMI, Y. **
National Research Institute
of Far Seas Fisheries
5-7-1 Orido
Shimizu-shi, Shizuoka 424

KOREA

PARK, Y.C.
National Fisheries Research
& Development Agency
65-3 Shirang-ri, Kijang-up
Yangsan-gun
Keongnam, 629-900

MOROCCO

SROUR, A.
Institut Scientifique des Pêches Maritimes
2 rue Tiznit
Casablanca

PORTUGAL

GOUVEIA, L.
Chefe de Divisao de Tecnicas e
Artes de Pesca
Direcçao Regional das Pescas
Estrada da Pontinha
9000 Funchal, Madeira

PEREIRA, J.
Universidade dos Açores
Departamento de Oceanografia e Pescas
9900 Horta, Faial, Açores

RUSSIA

LITVINOV, F.F.
AtlantNIRO
5, Dimitrij Donskogo
23600 Kaliningrad

SOUTH AFRICA

PENNEY, A.J.
Sea Fisheries Research Institute
Private Bag X2
Rogge Bay 8012

VAN ZYL, J.A.
Deputy Director
Department of Nature and
Environmental Conservation
Private Bag 9086
8000 Cape Town

SPAIN

ARIZ TELLERIA, J.
Instituto Español de Oceanografía
Centro Oceanográfico de Canarias
Apartado 1373
Santa Cruz de Tenerife

CARDENAS GONZALEZ, E.
Instituto Español de Oceanografia
Apartado 240
39080 Santander

CORT, J.L.
Instituto Español de Oceanografía
Apartado 240
39080 Santander

DE LA SERNA ERNST, J.M.
Instituto Español de Oceanografía
Apartado 285
Fuengirola (Malaga)

DELGADO DE MOLINA, A.
Instituto Español de Oceanografía
Centro Oceanográfico de Canarias
Apartado 1373
Santa Cruz de Tenerife

GONZALEZ COSTAS, F.
B.P. 1737
Abidjan 01 (Côte d'Ivoire)

LUCIO GALLO, P.
Azti-Sio
Isla de Txatxarramendi s/n
Sukarrieta (Vizcaya)

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

ORTIZ DE ZARATE, V.
Instituto Español de Oceanografía
Apartado 240
39080 Santander

PALLARES, P.
Instituto Español de Oceanografía
C/Corazón de María, 8
28002 Madrid

SANTANA FERNANDEZ, J.C.
Instituto Español de Oceanografía
Centro Oceanográfico de Canarias
Apartado 1373
Santa Cruz de Tenerife

SANTIAGO, J.
Azti-Sio
Isla de Txatxarramendi s/n
Sukarrieta (Vizcaya)

UNITED STATES

BROADHEAD, G.
P.O. Box 1427
Rancho Santa Fe, California 92067

BROWN, B.E.
Southeast Fisheries Center
NMFS
75 Virginia Beach Drive
Miami, Florida 33149

CRAMER, J.
Southeast Fisheries Center
NMFS
75 Virginia Beach Drive
Miami, Florida 33149

HESTER, F.
East Coast Tuna Association
2726 Shelter Island Drive, No.369
San Diego, California 92106

HOEY, J.
National Fisheries Institute
1525 Wilson Blvd., Suite 500
Arlington, Virginia 22209

PARRACK, N.C. **
Southeast Fisheries Center
NMFS
75 Virginia Beach Drive
Miami, Florida 33149

POWERS, J.
Southeast Fisheries Center
NMFS
75 Virginia Beach Drive
Miami, Florida 33149

PRAGER, M.H.
Southeast Fisheries Center
NMFS
75 Virginia Beach Drive
Miami, Florida 33149

PRINCE, E.
Southeast Fisheries Center
NMFS
75 Virginia Beach Drive
Miami, Florida 33149

RESTREPO, V.R. *
Cooperative Institute of Fisheries
Education and Research (CIFER)
University of Miami
4600 Rickenbacker Cswy.
Miami, Florida 33149

SCOTT, G.P.
Southeast Fisheries Center
NMFS
75 Virginia Beach Drive
Miami, Florida 33149

TURNER, S.C.
Southeast Fisheries Center
NMFS
75 Virginia Beach Drive
Miami, Florida 33149

VENEZUELA

ARELLANO PINTO, J.
Dirección General de Fronteras
División de Fronteras Marítimas
Ministerio de Relaciones Exteriores
Torre MRE, esq. Carmelitas, Piso 13
Caracas

GINEZ, A.
Director, Producción y Control
Ministerio de Agricultura y Cría
Dirección General Sectorial de Pesca
y Acuicultura
Torre Este, Piso 10
Caracas

GUZMAN, R.
Estación Experimental Sucre
FONAIAP
Av.Carupano-Caiguire
Apartado 236
Cumaná

PAGAVINO, M.
Instituto Oceanográfico de Venezuela
Apartado 245
Cumaná 6101

Observers

ALGERIA

CHALABI, A.
Institut des Sciences de la Mer et de l'Amenagement du Littoral (ISMAL)
B.P. 54
Sidi Fredj
42321 Staoneli, Tipaza

LIBYA

EL KEBIR, N.K.
Marine Biology Research Center
Libyan Arab Jamahiriya
P.O. Box 30830
Tajura

MAURITANIA

AHMED TALEB, S.E.M.
Ministère des Pêches et de l'Economie Maritime
B.P. 137
Nouakchott

EJIWEN, M.H.
Chef de Service Aménagement et Réglementation
Ministère des Pêches
B.P. 137
Nouakchott

M'BARECK, M. **
CNROP
B.P. 22
Nouadhibou

SOUEILEM, M.M.
Centre de Recherches Océanographiques et des Pêches (CNROP)
B.P. 22
Nouadhibou

International Organizations

CARIBBEAN COMMUNITY (CARICOM)

MAHON, R.
Senior Resource Assessment Unit Leader
c/o CFRAMP
Tyrell St.
Kingstown, St. Vincent & The Grenadines
(West Indies)

SINGH-RENTON, S.
Biologist
c/o CFRAMP
Tyrell St.
Kingstown, St.Vincent & The Grenadines
(West Indies)

COMMISSION OF THE EUROPEAN COMMUNITIES

REY, J.C.
Administrateur Principal
200 Rue de la Loi
B-1049 Bruxelles (Belgium)

FOOD & AGRICULTURE ORGANIZATION OF THE UNITED NATIONS (FAO)

MAJKOWSKI, J.
Marine Resources Service
Fishery Resources & Environmental Division (FAO)
Via delle Terme di Caracalla
00100 Roma (Italy)

PEROTTI, M.
Data and Statistical Service
Fisheries Department (FAO)
Via delle Terme di Caracalla
00100 Roma (Italy)

INTER-AMERICAN TROPICAL TUNA COMMISSION (IATTC)

DERISO, R.
IATTC
c/o Scripps Institute of Oceanography
8604 La Jolla Shores Drive
La Jolla, California 92037

****

TAIWAN

HSU, C.C.
Institute of Oceanography
National Taiwan University
P.O. Box 23-13
Taipei

Commission Secretariat

A. Fernández
P.M. Miyake
P. Kebe

Commission Secretariat (Continued)

M.E. Carel
M.A. F. de Bobadilla
J.L. Gallego
F. García
C. García Piña
S. Martin
A. Moreno
J.A. Moreno
P. Seidita
G. Stephens
G. Turpeau

Interpreters

M. Castel
L. Faillace
J. Jeelof
C. Lord
I. Meunier
T. Oyarzun

Temporary Staff

F. Bellemain

Appendix 3 to Annex 14

LIST OF SCRS DOCUMENTS

SCRS/92/1 Tentative Agenda of the SCRS - Secretariat

SCRS/92/2 Annotated Agenda of the SCRS - Secretariat

SCRS/92/3 Tentative Agenda of the Sub-Committee on Statistics - Secretariat

SCRS/92/4 Tentative Agenda of the Sub-Committee on Environment - Secretariat

SCRS/92/5 Organization of the 1992 SCRS Meeting - Secretariat

SCRS/92/6 Document Policy - Secretariat

SCRS/92/7 Report of the Fifteenth Session of the Coordinating Working Party on Atlantic Fishery Statistics (Dartmouth, Nova Scotia, Canada, 8-14 July, 1992)

SCRS/92/8 Catch data and detailed catch and effort and size data available for the Mediterranean tuna fisheries -Miyake, P. M., P. Kebe

SCRS/92/9 Swordfish data substitutions and raising made for 1992 - Miyake, P. M., P. Kebe

SCRS/92/10 Secretariat Report on Statistics and Coordination of Research - Secretariat

SCRS/92/11 Report of the Progress Made in 1992 in the Albacore Program - Bard, F. X.

SCRS/92/12 Secretariat Report on the Coordination of the ICCAT Enhanced Billfish Research Program - Secretariat

SCRS/92/13 Review of the Progress made by the Bluefin Year Program - Suzuki, Z., B. Liorzou

SCRS/92/14 Extracts of the Meeting Summary of the Tenth Session of Committee I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (Kyoto, Japan, March 2-13, 1992) - Secretariat

SCRS/92/15 The Report of the Data Preparatory Meeting for Southwest Atlantic Tuna and Tuna-Like Fisheries (Recife, Pernambuco, Brazil, July 1-7, 1992)

SCRS/92/16 Report of the Second ICCAT Billfish Workshop (Miami, Florida, U.S.A., July 22-29, 1992)

SCRS/92/17 Second GFCM/ICCAT Expert Consultation on Stocks of Large Pelagic Fishes in the Mediterranean Sea (Iraklion, Crete, Greece, September 17-23, 1992)

SCRS/92/18 Information concerning large-scale pelagic driftnet fishing on the high seas

SCRS/92/19 Technical consultation on high seas fishing (Rome, 7-15 September, 1992)

SCRS/92/20 Albacore data substitution and raising made for 1992 - Miyake, P. M., P. Kebe

SCRS/92/21 Bluefin data substitution and raising made for 1992 - Miyake, P. M., P. Kebe

SCRS/92/22 Documentation of albacore stock assessment work carried out at the special session (Madrid, October 13-17, 1992)

SCRS/92/23 Rapport national du Maroc - Srour, A.

SCRS/92/24 Progress of the ICCAT Enhanced Research Program for Billfish in the western Atlantic Ocean during 1992 - Prince, E. D.

SCRS/92/25 Notas sobre la estructura poblacional del pez espada, *Xiphias gladius*, en Venezuela - Alió M. J. J., L.A. Marcano, X. Gutiérrez, O. Rodríguez, H. Salazar

SCRS/92/26 The swordfish (*Xiphias gladius* L., 1758) surface longline fishing practised in the fisheries of eastern Sicily - Potoschi, A., G. Cavallaro, P. Sturiale, G. Pisciotta, A. Granata, B. Mellini

SCRS/92/27 Evaluation of alternative methods to estimate age compositions from length frequency data with specific reference to Atlantic swordfish, *Xiphias gladius* - Haist, V., J. M. Porter

SCRS/92/28 A standardized biomass index of abundance for north Atlantic swordfish - Hoey, J. J., J. Mejuto, J. Porter, Y. Uozumi

SCRS/92/29 Rapport concernant la pêche aux gros et moyens pélagiques en Algérie - Chalabi, A.

SCRS/92/30 Distribution and relative abundance of tunas and billfishes in the southwestern equatorial Atlantic - Hazin, F. H. V., R. Lessa, R. R. Arraes, M. R. Coimbra, R. C. Souza, M. Natalino, P. Pantoja

SCRS/92/31 Revision on statistical data of the Brazilian longliners based in Santos-SP (1971-90) - Amorim, A. F., C. A. Arfelli

SCRS/92/32 Preliminary biometric studies on *Thunnus albacares* from southwestern equatorial Atlantic - Lessa, R., M. N. Amorim, F. Hazin, M. R. Coimbra, R. C. Souza

SCRS/92/33 Tuna fishery in Brazil by leased Japanese longliner fleet from 1977 to 1991 - Antero Da Silva, J. N.

SCRS/92/34 Availability of catch, effort and size data for southwestern Atlantic tuna fisheries - Miyake, P. M., P. Kebe

SCRS/92/35 Preliminary analysis of fishing power of Brazilian baitboats - Meneses de Lima, J. H.

SCRS/92/36 Premières études sur la reproduction de thon jaune *Thunnus albacares* de l'Atlantique equatorial sud-ouest - Coimbra, M. R., R. Lessa, F. Hazin, R. Souza

SCRS/92/37 Une méthode simple d'ajustement des clés taille/âge: Application aux captures d'albacores (*Thunnus albacares*) de l'Atlantique Est-Gascuel, D.

SCRS/92/38 Analyse de l'évolution des puissances de pêche par l'analyse des cohortes: Application aux senneurs exploitant l'albacore (*Thunnus albacares*) dans l'Atlantique Est - Gascuel, D., A. Fonteneau, E. Foucher

SCRS/92/39 Logs and tunas in the eastern tropical Atlantic. A review of present knowledges and uncertainties - Ariz, X., A. Delgado, A. Fonteneau, F. Gonzáles Costas, P. Pallarés

SCRS/92/40 Retrospective analysis of swordfish VPA - Hiramatsu, K.

SCRS/92/41 Estimation of standardized CPUE for the Atlantic swordfish using the data from the Japanese longline fishery - Nakano, H.

SCRS/92/42 The trend of mean length of Atlantic swordfish from 1975 to 1990 caught by the Japanese longline fishery - Uosaki, K., Y. Uozumi

SCRS/92/43 "Age" specific standardized indices of abundance for swordfish (*Xiphias gladius*) from the Spanish longline fleet in the Atlantic, 1983-1991 - Mejuto, J.

SCRS/92/44 A simple descriptive and comparative analysis of the activity of the peninsular Spanish fleets targeting albacore (*Thunnus alalunga*) in the Atlantic Ocean from 1990-1991 - García, B., J. Mejuto

SCRS/92/45 On the hypothesis of comfortability stipulation of tuna association with natural and artificial floating objects - Batalyants, K. Ya.

SCRS/92/46 State of yellowfin tuna females (*Thunnus albacares*) ovaries and oocytes in longline and purse catches during spawning period - Batalyants, K. Ya.

SCRS/92/47 A new length-weight relationship for the North Atlantic albacore - Santiago, J.

SCRS/92/48 Composición en edades de la captura internacional de atún blanco del Atlántico norte de 1975 a 1991, estimada a partir de MULTIFAN - Santiago, J.

SCRS/92/49 Activity of the Spanish surface longline fleet targeting swordfish (*Xiphias gladius* L.) in the Atlantic, years 1988 to 1991, combined - Mejuto, J., B. García, J. M. de la Serna

SCRS/92/50 Genetic analysis of billfish population structure - Graves, J. E., J. R. McDowell

SCRS/92/51 White marlin (*Tetrapturus albidus*) fisheries off Brazilian coast from national and leased longliner fleet - Antero-Silva, J. N., A. F. Amorim, R. P. T. Lessa, F. H. V. Hazin, C. A. Arfelli

SCRS/92/52 Sailfish (*Istiophorus platypterus*) fisheries off Brazilian coast by national and leased longliners (1971-91) - Hazin, F. H. V., R. P. T. Lessa, A. F. Amorim, C. A. Arfelli, J. N. Antero-Silva

SCRS/92/53 Blue marlin (*Makaira nigricans*) fisheries off Brazilian coast by national and leased longliners (1971-91) - Amorim, A. F., C. A. Arfelli, F. H. V. Hazin, J. N. Antero-Silva, R. P. T. Lessa, R. R. Arraes

SCRS/92/54 Billfish sport fishery off Brazilian coast - Arfelli, C. A., A. F. Amorim, R. Graça-Lopes

SCRS/92/55 Landings of blue marlin (*Makaira nigricans*) and white marlin (*Tetrapturus albidus*) in Bermuda during the period 1975-1991 with an overview of the development of recreational billfishing on the island - Luckhurst, B. E.

SCRS/92/56 Summary of activities involving the development of antibody-based field identifi- cation kits for Atlantic blue marlin, white marlin, and Atlantic sailfish 1988-1992 - Hartmann, J. X., J. C. Poyer, E. A. Rossi, S. R. Shepard, R. E. Waldner

SCRS/92/57 Bias-corrected length and weight conversion equations for Atlantic blue marlin, white marlin, and sailfish - Prager, M. H., D. W. Lee, E. D. Prince

SCRS/92/58 A history of the recreational billfishing survey in the northern Gulf of Mexico, 1971-1991: purpose, methods, and summary - Avrigian, A. M., M. I. Farber, P. J. Pristas

SCRS/92/59 A summary of shore-based and at-sea sampling in the western Atlantic Ocean 1987-1992: ICCAT Enhanced Research Program for Billfish - Carter, R. L.

SCRS/92/60 A review of tag release and recapture files for istiophoridae from the Southeast Fisheries Center's Cooperative Gamefish Tagging Program, 1954 to present - Bayley, R. E., E. D. Prince

SCRS/92/61 Sailfish lengths, weights, and sex data from the Senegalese sport fishery in 1980 and 1982 - Paris, C. L., M. F. McGowan

SCRS/92/62 Standardization of recreational fishing success for marlin in the western north Atlantic Ocean, 1973-1991, using generalized linear model techniques - Farber, M. I., J. A. Browder, J. P. Contillo

SCRS/92/63 The CPUE trend for Atlantic white marlin caught by Japanese longline fishery - Nakano, H., Y. Uozumi, M. Honma

SCRS/92/64 The CPUE trend for Atlantic blue marlin caught by Japanese longline fishery - Nakano, H., Y. Uozumi, M. Honma

SCRS/92/65 A historical review of Japanese longline fishery and billfish catches in the Atlantic Ocean - Uozumi, Y., H. Nakano

SCRS/92/66 Identification of billfish species using mitochondrial cytochrome B gene fragment ampli- fied by polymerase chain reaction - Chow, S.

SCRS/92/67 Analysis of the ICCAT Enhanced Re- search shore-based sampling programme in Grenada from 1988-1992 - Phillip, P. E., C. J. Isaac

SCRS/92/68 Billfish C/E data from Barbados, Grenada, St. Lucia and St. Vincent and the Grenadines - Mahon, R., *et al.*

SCRS/92/69 Exploratorysurplus-production analyses of blue and white marlin fisheries in the North Atlantic - Cramer, J., M. Prager

SCRS/92/70 Les istiophorides en Atlantique-est: Stude des pêcheries et quelques aspects de la biologie du voilier au Sénégal - Diouf, T.

SCRS/92/71 Recent billfish catch data for Barbados (1987-1992) - Oxenford, H. A.

SCRS/92/72 Analysis of the correlation among indices of relative abundance of tuna and billfish species caught in the Taiwanese and Japanese Atlantic longline fisheries - Ehrhardt, N. M.

SCRS/92/73 Descriptive analysis of the artisanal fishery of billfish in the central coast of Venezuela - Alio, J. J., *et al.*

SCRS/92/74 Changes in the apparent abundance indices of billfishes in the Venezuelan recreational fishery off Playa Grande (1961-1990), Central Venezuelan coast - Gaertner, D., J. J. Alio

SCRS/92/75 The billfish fishery in Ghana - Mensah, M. A., B. A. Doyi

SCRS/92/76 ICCAT Enhanced Research Program for Billfish - Jamaica, 1990-1991 - Harvey, G. C. M.

SCRS/92/77 A review of the recreational fishery for the Atlantic sailfish *Istiophorus albicans* in Cozumel Island, Quintana Roo, Mexico -Martínez, M. A., M. E. González

SCRS/92/78 Análisis de los muestreos realizados en la pesquería de atún con palangre en Venezuela entre 1988 y 1990 - Salazar, H. D., J. S. Marcano

SCRS/92/79 Informe Nacional de Venezuela - Dirección General Sectorial de Pesca y Acuicultura

SCRS/92/80 Note sûr la présence de divers parasites de l'espadon *Xiphias gladius* L., pêché près des côtes algériennes. Identification d'un digenea Didymozoidae Poche, 1907, signalé pour la première fois en Méditerranée - Chalabi, A., F. Ifrene, A. Kouadri, N. Merazka

SCRS/92/81 Resultados de la campaña de marcado de pez espada (*Xiphias gladius*) realizada en el Mediterráneo en año 1991 - de la Serna, J. M., E. Alot

SCRS/92/82 Resultados de la campaña de marcado de atún rojo (*Thunnus thynnus*) realizada en el Mediterráneo occidental en el año 1991 - de la Serna, J. M., E. Alot

SCRS/92/83 Recent information on the amount and size of bluefin tuna imported to Japan - Miyabe, N., Y. Warashina

SCRS/92/84 Genetic structure of swordfish (*Xiphias gladius*) populations of the Mediterranean and the eastern side of the Atlantic: Analysis by mitochondrial DNA markers - Magoulas, A., G. Kotoulas, J. M. de la Serna, G. De Metrio, N. Tsimenides, E. Zouros

SCRS/92/85 Greek swordfish fishery; some trends in the size composition of the catches - Tserpes, G., P. Peristeraki, N. Tsimenides

SCRS/92/86 Análisis preliminar del sex-ratio por clase de talla del pez espada (*Xiphias gladius*) capturado con palangre de superficie en el Mediterráneo occidental - Serna, J. M. de la, E. Alot, M. D. Godoy

SCRS/92/87 A preliminary analysis to obtain a size weight relationship for the Mediterranean swordfish (*Xiphias gladius*) - Mejuto, J., J. M. de la Serna

SCRS/92/88 Relation taille-poids et composition en tailles des captures du thon rouge (*Thunnus thynnus*) de la Méditerranée marocaine - Srour, A.

SCRS/92/89 Approche de la croissance de l'espadon *Xiphias gladius* en Méditerranée algérienne - Chalabi, A., H. Dib, A. Ourdani, S. M. Rahmoun

SCRS/92/90 Approche de la croissance de l'espadon *Xiphias gladius* en baies de Béni-Saf et de Bou Ismail - Chalabi, A.

SCRS/92/91 Le régime alimentaire hivernal de l'espadon *Xiphias gladius* L. pêché près des côtes est de l'Algérie - Chalabi, A., F. Ifrene

SCRS/92/92 Dosage des métaux lourds Fe, Zn, Pb, Cu, Cd et Hg chez l'espadon *Xiphias gladius* L. pêché en Algérie - Chalabi, A., S. M. Ghomari, M. Moualek, A. Benamar, A. Tchantchane

SCRS/92/93 Distribution des larves de thonidés en Méditerranée - Piccinetti, C., G. Piccinetti Manfrin

SCRS/92/94 Swordfish fishing January-August 1992 - Economou, E., D. Konteatis

SCRS/92/95 Swordfish (*Xiphias gladius* L.) driftnet fishery in the western Italian seas: 1990-1991 Report - Di Natale, A., A. Mangano, A. Maurizi, L. Montaldo, E. Navarra, S. Pinca, G. Schimmenti, G. Torchia, M. Valastro

SCRS/92/96 Review of the swordfish fishing 1986-1991 - Economou, E., D. Konteatis

SCRS/92/97 Swordfish fishing 1986-1989 - Economou, E., D. Konteatis

SCRS/92/98 Development of swordfish fishery in Cyprus, 1975-1985 - Economou, E., D. Konteatis

SCRS/92/99 Etat actuel de la pêcherie thonière au Maroc - Srour, A.

SCRS/92/100 Some remarks on the bluefin tuna fishery in Turkish waters - Oray, I. K.

SCRS/92/101 Resumé sûr la pêche nationale en Algerie - Kadari, G.

SCRS/92/102 Analyse de l'âge, de la croissance et des captures des thons rouges (*Thunnus thynnus*) et des thonines (*Euthynnus alleteratus* L.) pêchés dans les eaux tunisiennes -Hattour, A.

SCRS/92/103 Status of Taiwanese longline fisheries in the Atlantic, 1991 - Hsu, C. C., H. C. Liu

SCRS/92/104 The adjusted longline CPUE of North and South Atlantic albacore stock by three methods - Hsu, C. C., S. K. Chang

SCRS/92/105 The catches of bluefin tunas by Taiwanese in the Atlantic, Indian and Pacific Oceans - Hsu, C. C.

SCRS/92/106 Catch at size of albacore caught by Japanese longline fishery in the Atlantic Ocean from 1956 to 1990 - Uozumi, Y.

SCRS/92/107 Notes about the structure of the fished stock of swordfish from the Ligurian Sea - Relini, L. Orsi, G. Palandri, F. Garibaldi

SCRS/92/108 Studies on the age and growth of South Atlantic albacore (*Thunnus alalunga*) specimens collected from Taiwanese longliners - Lee, L. K, S. Y. Yeh

SCRS/92/109 Vessel-trip sampling plan for U.S. longline vessels operating in the Atlantic - Cramer, J. C., D. W. Lee, G. P. Scott

SCRS/92/110 Some characteristics of the U.S. fishery for swordfish since 1987 - Cramer, J., A. R. Bertolino, M. I. Farber

SCRS/92/111 Update of the 1991 and 1992 data available on Atlantic swordfish sex ratio at size collected from the U.S. and Venezuelan fisheries - Lee, D. W., F. Arocha

SCRS/92/112 Preliminary observations on sex ratio and maturity stages of the swordfish, *Xiphias gladius*, in the northwest Atlantic - Arocha, F., D. Lee

SCRS/92/113 A nonequilibrium production model of swordfish: Data reanalysis and possible further directions - Prager, M. H.

SCRS/92/114 A bootstrapped nonequilibrium production model of swordfish, based on latest data - Prager, M. H.

SCRS/92/115 Note on the application of iterative age-length keys for reduction of ageing bias in the presence of sexually dimorphic growth - Restrepo, V. R.

SCRS/92/116 Some options for estimating 1992 U.S. TAC for swordfish - Scott, G. P.

SCRS/92/117 Standardized catch rates for swordfish (*Xiphias gladius*) from the U.S. longline fleet through 1991 - Scott, G. P., V. R. Restrepo, A. Bertolino

SCRS/92/118 Condiciones térmicas observadas durante la campaña de marcado de atún blanco (*Thunnus alalunga*, Bonn. 1788) en 1991 - Ortiz de Zárate, V., J. Gil, M. Quintans

SCRS/92/119 Estimación del crecimiento de atún blanco del Atlántico nordeste a partir de los datos de marcado/recaptura - Ortiz de Zárate, V., C. Rodríguez-Cabello

SCRS/92/120 Rapport du Groupe de travail ORSTOM sur le comportement agregatif des poissons pelagiques - Stretta, J. M.

SCRS/92/121 Análisis de las tallas de listado (*Katsuwonus pelamis*), capturado frente a las costas de Venezuela - Pagavino, M.

SCRS/92/122 Appropriate weight-length relations for converting catches in weight to catches in numbers for north Atlantic albacore stocks - Parrack, N. C.

SCRS/92/123 Swordfish (*Xiphias gladius* L.) longline fishery in the western Italian Seas and in the Sicily Channel: 1991 Report - Di Natale, A., A. Mangano, A. Maurizi, L. Montaldo, E. Navarra, S. Pinca, G. Schimmenti, M. Valastro

SCRS/92/124 National report of the United States: 1992 - NMFS, Southeast Fisheries Center

SCRS/92/125 Stock assessments for U.S. stocks of king and Spanish mackerels: 1983-1992 - Powers, J. E., N. B. Thompson

SCRS/92/126 The United States Atlantic coastal shark fishery - Parrack, M. L., José I. Castro, J. E. Powers

SCRS/92/127 Recent developments in extending the ASPIC production model - Prager, M. H.

SCRS/92/128 Refinements in exploratory surplus-production analyses of Atlantic blue marlin - Cramer, J., M. H. Prager

SCRS/92/129 An exploratory stock-production model analysis of white marlin (*Tetrapturus albidus*) in the Atlantic Ocean - Farber, M. I., C. D. Jones

SCRS/92/130 Use of oceanographic data to support stock assessment of oceanic pelagic species in the western north Atlantic - Browder, J. A., S. Turner

SCRS/92/131 Catch estimation utilizing simulation modeling and bootstrapping methodology - Brown, C. A.

SCRS/92/132 Relationship of charter/private vessel sampling levels to the variance of the effort estimators for the Virginia rod and reel pelagic fishery - Brown, C. A.

SCRS/92/133 The effects of numbers of mark-recapture observations on coefficients of variations of fleet size estimates - Turner, S. C.

SCRS/92/134 Projecting small bluefin tuna catches in the U.S. rod and reel fishery for regulation by quota - Browder, J. A., G. P. Scott, S. Turner, V. R. Restrepo

SCRS/92/135 Confidence limits of catch per unit effort estimates as a function of sampling effort for the large pelagic recreational fishery in Virginia - Porch, C. E.

SCRS/92/136 Confidence limits of trip frequency estimates as a function of sampling effort for the large pelagic recreational fisehry along the northeast United States - Porch, C. E.

SCRS/92/137 Mark-recapture estimates of the number of recreational vessels fishing for large pelagics off the northeast United States-Porch, C.E.

SCRS/92/138 Estimation and projection of the 1992 landings of bluefin tuna in the rod and reel fishery for large pelagic fish off the northeast United States - Turner, S. C., H. A. Foster, C. Brown, M. Terceiro, D. S. Van Voorhees, G. P. Scott, J. A. Browder, D. J. Christensen, C. E. Porch

SCRS/92/139 Actualisation des données sur le thon rouge exploité au large des côtes françaises de Méditerranée - Liorzou, B., J. L. Bigot

SCRS/92/140 Preliminary efforts to estimate dimensions and weights of hooked blue marlin using video images of fish at the boat - Lucy, J. A., J. E. Kirkley

SCRS/92/141 Pêche thonière et objets flottants: Situation mondiale et perspectives - Fonteneau, A.

SCRS/92/142 Variación de las capturas de túnidos tropicales y túnidos templados en las Islas Canarias desde 1975 a 1991 - Ariz, J, J. C. Santana, A. Delgado de Molina

SCRS/92/143 Reciente información sobre la pesquería de atún rojo con cebo vivo en el Mar Cantábrico - Cort, J. L.

SCRS/92/144 Informe nacional de España

SCRS/92/145 A review of the Japanese fishery and research on sharks in the Atlantic Ocean - Nakano, H.

SCRS/92/146 The catch statistics of the billfish fishery in Ghana - Mensah, M. A.

SCRS/92/147 Description des pêches et des statistiques de poissons porte epée au port d'Abidjan. 1987-1992 - Amon Kothias, J. B., F. X. Bard, A. Hervé

SCRS/92/148 Information sur les requins deparqués au port d'Abidjan - Bard, F. X., J. Konan

SCRS/92/149 Une consequence inattendue de la pêche thonière sous épave artificielle: L'accroissement des ventes de thonidés mineurs à Abidjan - Bard, F. X., A. Hervé

SCRS/92/150 Age specific standardized catch rates for albacore (*Thunnus alalunga*) from the Spanish surface fleets in the north Atlantic, years 1983-1991 - Mejuto, J., B. García

SCRS/92/151 The effect of the introduction of new devices (FAD) and bird radars in the baitboat fishery of tuna in Ghana - Kwei, E. A., P. Bannerman

SCRS/92/152 Rapport sur la Conference de Cancun (Mexique) sur la pêche responsable (du 6 au 8 mai 1992) - Fonteneau, A.

SCRS/92/153 Rapport national de la France

SCRS/92/154 Report of the CARICOM Fishery Resource Assessment and Management Program - Mahon, R., S. Singh Renton

SCRS/92/155 Statistiques de LA pêcherie thonière FIS durant la période de 1969 à 1991 - Diouf, T., A. Fonteneau

SCRS/92/156 Rapport du groupe de travail ORSTOM Thon-Libéria (Annexe disponible en 10 exemplaires au Secrétariat de l'ICCAT) - ORSTOM

SCRS/92/157 Analyse de l'état du stock d'albacore de l'Atlantique est *(Thunnus albacares)* fin 1991 - Fonteneau, A., T. Diouf

SCRS/92/158 National Report of Russia, 1991-1992 - Gaikov, V. Z., M. E. Grudtsev, K. Ya. Batalyants, F. F. Litvinov

SCRS/92/159 Production model analysis on Atlantic bigeye tuna as of 1990 - Pereira, J., N. Miyabe

SCRS/92/160 Etat du stock du patudo de l'Atlantique au 30 Septembre 1992 - Pereira, J.

SCRS/92/161 Statistiques de la pêche thonière açorienne, années 1979-1991 - Pereira, J.

SCRS/92/162 Rapport national du Portugal - Pereira, J.

SCRS/92/163 Resultados de los análisis de los contenidos estomacales de listado, *Katsuwonus pelamis* (Linnaeus, 1758) capturado en aguas de Canarias - Olaso, I., A. Delgado de Molina, J. C. Santana, R. Delgado de Molina, J. Ariz

SCRS/92/164 Resultados de experiencias de marcado realizadas sobre listados en aguas de las Islas Canarias - Delgado de Molina, A., J. C. Santana, R. Delgado de Molina, J. Ariz

SCRS/92/165 Estimación de una ecuación talla-peso para *Acanthocybium solandri* (Cuvier, 1832), capturado en la Isla de El Hierro (Islas Canarias) - Santana, J. C., A. Delgado de Molina, J. Ariz

SCRS/92/166 Estadísticas españolas de la pesquería atunera tropical en el Océano Atlántico - Delgado de Molina, A., J. C. Santana, P. Pallarés, J. Ariz

SCRS/92/167 Datos estadísticos de la pesquería de túnidos de las Islas Canarias durante el período 1975 a 1991 - Ariz, J., J. C. Santana, A. Delgado de Molina

SCRS/92/168 National Report of Canada-Porter,J.M.

SCRS/92/169 Standardized CPUE of Atlantic bluefin in the eastern Atlantic and Mediter- ranean Sea obtained from the Japanese longline fishery-Miyabe,N.

SCRS/92/170 National Report of Japan - National Research Institute of Far Seas Fisheries

SCRS/92/171 Some comments on the approaches used to assess south Atlantic albacore -Punt,A.E.

SCRS/92/172 National report of Korea - National Fisheries Research and Development Agency

SCRS/92/173 National Report of Brazil - Meneses de Lima, J. H.

SCRS/92/174 National Report of South Africa - Penney, A. J.

SCRS/92/175 Rapport national de la Côte d'Ivoire, Kothias, A., F. X. Bard

Appendix 4 to Annex 14

REPORT OF THE AD HOC GROUP ON SCRS DOCUMENT ACCEPTANCE

The *Ad Hoc* Group on Document Acceptance met briefly to discuss whether the documents presented to the 1992 SCRS were in compliance with the criteria established for acceptance. In general, the documents fulfilled the criteria, with the following exceptions:

The copies of a document concerning bluefin arrived too late for consideration by the species group and, therefore, was not accepted.

The number of copies of documents SCRS/92/40, 41, 42, 106, 118, 119, 132 and 138 fell short of the 80 copies required for delivery by the deadline. However, a sufficient number of copies were delivered for distribution among the species groups. Since the remainder of the copies were delivered well in advance of the Plenary Sessions, these documents were accepted.

Documents SCRS/92/50 to SCRS/92/77 were presented to the Second ICCAT Billfish Workshop in July, 1992. The participants were requested at the time of the Workshop to revise and resubmit their documents by the normal deadline, or to inform the Secretariat that there were to be no changes and the Secretariat would produce the required copies. All Workshop documents that were revised or updated were re-submitted to the SCRS. However, some documents (SCRS/92/50, 55, 56, 57, 59, 60, 67, 68, 70, 71, 72, 73, 74, and 76) had no changes, but this was not communicated to the Secretariat and copies were not provided for distribution at the SCRS. One copy of each of these documents was available from the billfish species rapporteur for reference. These documents will be included in the Billfish Workshop publication and were accepted as SCRS documents.

Four documents (SCRS/92/51, 52, 53, and 54) were submitted directly to the Billfish Workshop in July, 1992, and revised versions were re-submitted to the Secretariat in time for the 1992 SCRS meeting. However, they were not authorized by the national delegation. A proposal was agreed upon by the Head Delegate of Brazil, Mr. J. H. Meneses de Lima, to have them submitted provisionally to SCRS until formal submission through the correct channels can be made. This proposal was accepted by the Ad Hoc Group.*

Two new documents were received (with the required 80 copies) well past the deadline and too late to be considered by the species groups. They are "Análisis de la captura y el esfuerzo de la pesquería atunera de pequeños palangreros en el Caribe venezolano: 1983-1991" and "Análisis preliminar de la pesquería artesanal de peces de pico en la region nor-oriental de Venezuela." The Group decided to accept these as 1993 SCRS documents, and make them available to all interested scientists.

All documents received after the opening of the meeting and after the first meeting of the *Ad hoc* Group on Document Acceptance were not accepted as SCRS documents but were distributed to the SCRS participants for reference.

* These documents were later submitted through the correct channels.

Appendix 5 to Annex 14

REPORT OF THE WORKING GROUP ON THE FEASIBILITY STUDY ON MERISTICS OF YELLOWFIN TUNA

During the SCRS Meeting, a Working Group was formed which discussed the possibility of analyzing stock structure using morphometric and meristic studies similar to those carried out by Schaefer* for Pacific yellowfin tuna. Since biometric measurements form the basis of this study, it would be necessary to attain a high degree of accuracy in sampling. Certain sources of sampling variation, such as a change in the sampler and the state of fish, whether fresh or frozen, could give undesirable variation in measurements leading to unclear results. In addition, in order to properly address the problem of stock structure, each set of measurements of similar-sized fish in different areas of the Atlantic Ocean should be conducted within a short time period to avoid the masking effect of any stock mixing.

In Schaefer's study, one individual conducted all the sampling throughout the Pacific Ocean. However, such a sampling program would be expensive and would still not guarantee conclusive results. Possible lower cost alternatives would be to focus efforts only on specific areas, or on specific age groups (or size groups) believed to be affected by stock mixing, for which a result is needed. In addition, among the data collected in Schaefer's study, gill raker count measurements did not suffer from the sources of sampling variation noted above. Furthermore, if an analysis of gill raker counts shows distinct differences, this would obviate the need to use additional measurements. Further discussions on a proposal to conduct this type of study are scheduled during the next SCRS stock assessment of yellowfin tuna.

Appendix 6 to Annex 14

GENERAL RECOMMENDATIONS OF THE TROPICAL TUNAS SPECIES GROUPS

In 1991, a proposal was presented at the SCRS Meeting concerning with the necessity for studying the new situation created in the purse seine fisheries of the eastern Atlantic Ocean (the massive introduction of artificial floating objects that aggregate tunas), and consequently, to improve the system of collection and processing of size samples.

The Committee asked the Secretariat to contract a biostatistician to carry out this work. Financial difficulties made this impossible, and hence the need was reiterated to formulate a contract with a biostatistician or to create a working group to deal with this matter.

In the meantime, in addition to compiling Task I and Task II data, the scientists responsible for these fisheries were asked to proceed to create data bases from the catches obtained in association with floating objects, whales, etc., and from those obtained from free schools (with- out associations), and to consider these strata separately when weighting the size samples.

It is necessary to study the suitability of multi-species sampling of catches made from schools associated with floating objects, or the use of another type of sampling scheme (such as that used in the Indian Ocean) in order to correct sampling biases.

The situation remains the same as that indicated last year and the 1991 recommendations were included in Appendix 6 to Annex 16 (Report for Biennial Period 1990-91, Part II).

---

* Schaefer, Kurt M., 1989. Morphometric Analysis of Yellowfin Tuna, Thunnus albacares, from the Eastern Pacific Ocean, IATTC Bull. 19(5).
Schaefer, Kurt M., 1992. An Evaluation of Geographic and Annual Variation in Morphometric Characters and Gill Raker Counts of Yellowfin Tuna, Thunnus albacares, from the Pacific Ocean, IATTC Bull. 20(3): 135-152.

Appendix 7 to Annex 14

REPORT OF THE SUB-COMMITTEE ON STATISTICS

1. Opening of the Meeting

The 1992 meeting of the ICCAT Sub-Committee on Statistics was held in Madrid, Spain, at the Hotel Pintor on November 3 and 4. Dr. S. Turner (U.S.A.), Convener of the Sub-Committee, welcomed all the participants.

2. Adoption of Agenda and Arrangements for the Meeting

The Tentative Agenda was adopted and is attached as Addendum 1 to this Report. Dr. P. M. Miyake (Secretariat) served as rapporteur.

3. Review of National Statistics

3.a Data collection and reporting

The Secretariat Report on Statistics and Coordination of Research (COM-SCRS\92\10) was reviewed, as regards the data collection and reporting by the national offices. The attached Table 1 shows the updated status on the availability of 1991 data at the time of the meeting.

The Sub-Committee was pleased to note that major improvements have been made on the ICCAT historical data base, thanks to the various inter-sessional meetings held this year (namely, the Data Preparatory Meeting for the Southwest Atlantic Fisheries, the Second ICCAT Billfish Workshop, and the Second GFCM/ICCAT Expert Consultation on Stocks of Large Pelagic Fish in the Mediterranean Sea). Details on these improvements are discussed in various sections of this Report.

The Sub-Committee noted that the reporting of Task I catch data for this year was more timely than in previous years, mostly due to the various aforementioned inter-sessional meetings held by ICCAT.

It was also noted in the Sub-Committee that some of the Task II catch and effort data was submitted in larger time-area strata than specified by the Committee. It was recommended that, in the future, Table 1 should include a column that indicates the time and area stratum in which the data are reported.

3.b Improvements to be made

The reporting of Task II size, catch and effort as well as catch-at-size data was not quite timely for many countries, which made it difficult for the Secretariat to prepare the data files (e.g., catch-at-size tables) for the stock assessment sessions in advance of the meetings. Those data, particularly concerning those species for which stock assessments are being carried out at the meeting, must be reported by the deadline dates established. If not, this can cause serious delays in the stock assessment work done at the session.

There still remains a major problem in the reporting of Mediterranean fisheries statistics, even though significant progress has been made (see Document SCRS/92/17 and Section 6.a of this Report).

The lack of a series of standardized catch per unit of effort, which is essential for stock assessment, was noted for many areas (particularly for the Mediterranean and the South Atlantic in general). The Sub-Committee recommended that national scientists report the standardized indices for all the major fisheries for the major species. If this is not possible, then detailed catch and effort data in the smallest time-area strata available should be reported.

4. Examination of the Secretariat's Statistical Work in 1992

4.a Data processing carried out in 1992

Details of the data processing carried out by the Secretariat during 1992 are contained in Document COM-SCRS\92\10. The Sub-Committee recognized the progressive increase in the volume of data to be processed by the Secretariat, particularly to comply with the mandate to prepare the data files needed for the various stock assessment sessions and inter-sessional scientific meetings. The present strategy of the SCRS to hold various working sessions throughout the year has eased the workload somewhat. However, the 1992 inter-sessional meeting schedule was extremely heavy for the July through October period, which made it difficult for the Secretariat to keep up with all the preparatory work, and in some cases there were delays in providing the participants at these meetings with the necessary data. Therefore, the Sub-Committee recommended that the SCRS keep these difficulties and logistical aspects in mind when planning the 1993 inter-sessional meeting schedule.

4.b Port sampling program

The Sub-Committee reported that port sampling activities at the transshipment ports were again minimal in 1992. The major reasons are that there are now fewer longline operations and that more vessels are transshipping their catches at sea, due to their being equipped with freezers having extremely low temperatures. At the same time, the samplers were not well supervised, due, for the most part, to the Secretariat's not being able to visit the sampling sites in the last few years to provide on-the-spot advice and guidance to the samplers.

The Sub-Committee recognized that while full implementation of port sampling is very costly, if the scheme were to be abandoned, it would be very difficult to reconstruct when needed. Being aware of increasing activities of fleets flying flags of convenience of non-Contracting Parties, it was agreed to maintain a minimum level of port sampling, particularly aimed at collecting statistics of those non-Contracting Party fleets.

The Sub-Committee expressed its appreciation to South Africa for sampling the transshipments of Asian longliners at Cape Town. The high quality data submitted are very effective for checking the albacore size data measured by fishermen at sea. The Sub-Committee also appreciated the offer made by Dr. E. Prince, the West Atlantic Billfish Program Coordinator, to check and enforce the sampling system at St. Maarten, as best he can, on his visit to the Island to sample the billfish tournament.

4.c Secretariat data management policy

The Sub-Committee reiterated that the first data management priority of the Secretariat was to keep the basic data base updated, complete and error-free.

The feasibility of introducing a quick data retrieval system was briefly discussed. In the past, the Secretariat had presented studies on the available data base software which can handle such voluminous data files. The Sub-Committee had not approved such a data base system at that time on the basis of its high cost, low efficiency, and its limitation. At present, the data are all in ASCII files and are managed by Fortran programs.

4.d Data dissemination and publication of data

The Sub-Committee noted that now that the Secretariat has practically caught up on its accumulated data requests from the national scientists working directly on ICCAT stock assessments, new requests which it receives are completed within a very short period.

The Commission's statistical publications were reviewed and the current publication policy was approved.

4.e Other Matters

A replacement to fill the vacant programmer's position was discussed. This position has not been filled due to financial constraints. However, it was pointed out that there has been an extra burden of work on the current Secretariat staff and the resulting delays in data processing work caused some problems for the scientists at the meetings, particularly at the stock assessment sessions. The Sub-Committee noted that those delays reduced the time available for

analysis and careful consideration of results and may impact the Committee's ability to provide advice to the Commission.

It was reported that the scientists that met in October, 1992, to carry out an assessment of albacore were affected by the Secretariat's not being able to assist the group in running existing software for stock assessment purposes. Part of the problem was the need for expanded computer facilities at the Secretariat, and part was considered to be due to reduced staff levels.

The Sub-Committee identified the need of an experienced biostatistician on the permanent staff of the Secretariat. This biostatistician should have adequate experience in fisheries biology and expertise in computer science, so that the software at the Secretariat can be put in good order, updated, and kept ready for use by the scientists. During the stock assessment sessions, the biostatistician should be able to facilitate any scientist who wishes to use these stock assessment programs, although the actual application of the programs and their interpretation remains the responsibility of the scientists involved in the stock assessment groups.

It was also noted that the biostatistician should be able to reorganize the basic files for more efficiency, to develop a more sophisticated system for data substitutions and raising size by catches, and to analyze the adequacy of the data and sampling system.

The Sub-Committee strongly recommended that a biostatistician with such expertise be hired as soon as possible and that this position be graded at the proper level of U.N. classification (i.e., Professional category).

5. Examination of the Problem of Unreported Catches by Non-Contracting Parties

The Sub-Committee noted that the catches by tuna fishing boats of non-Contracting Parties have been increasing over the past several years. The Sub-Committee was informed of the results of the meeting of the ICCAT "Working Group to Develop Technical Details for the Implementation of an ICCAT Resolution on Catches by Non-Contracting Parties", held in Tokyo in May, 1992 (COM/92/25). The Report includes information on the discussion concerning the collection of statistics of these fleets. The Sub-Committee recognized that the increasing catches of such non-Contracting Parties are jeopardizing the current statistical coverage system and making it more difficult to obtain adequate statistics.

Some tropical tuna boats are changing their registrations from countries which are members of, or cooperate with ICCAT, to small countries, mostly due to economic reasons. Catches by these vessels were unloaded mostly at African ports for transshipment. The Sub-Committee noted that many of these small countries have no way of controlling the fishery nor the reporting of catches. The data have been partially extracted by the scientists working at the transshipment ports are reported as "NEI" (Nowhere Else Included) in the ICCAT catch statistics.

The temperate tuna longliners change country of registration mainly to avoid international fishing regulations. This causes considerable problems in obtaining catch estimates for this fleet. Document SCRS/92/83 reported the quantity and size of bluefin tuna imported to Japan. This document was reviewed at the Second GFCM/ICCAT Expert Consultation on Large Pelagic Fish in the Mediterranean Sea, and during the bluefin stock assessment session. From this, the unreported catches of fleets that fly flags of convenience were estimated.

The Sub-Committee stressed the increasing importance of collecting statistics from these fleets.

6. Review of the Progress Made on Recommendations for Statistics (as contained in the 1991 SCRS Report)

6.a Improvement of Mediterranean statistics

The results of the Second GFCM/ICCAT Expert Consultation on Large Pelagic Fish in the Mediterranean Sea (Crete, Greece - September, 1992) were presented and the Report (SCRS/92/17) were reviewed. The Sub-Committee recognized that significant progress has been made in the collection of statistics from Mediterranean countries that are not Contracting Parties to the Commission. However, there are still many important problems to resolve, such as the lack of accurate catch statistics for many of these fisheries, and the lack of reliable abundance indices and size data. In particular, a part of the Italian catch statistics for all past and current years

are still not available and many of these catches lack biological samples. This problem resulted in uncertainties in the stock assessments on Atlantic bluefin tuna and prevented any assessment from being carried out for Mediterranean swordfish.

The Sub-Committee recommended that the Committee approve the proposal made by the Consultation to form a joint GFCM/ICCAT *Ad hoc* working group. Such a permanent relationship would serve as a mechanism through which the exchange of data and information could be maintained between both organizations.

The Sub-Committee foresaw some potential problems in collecting catch and effort data, on an individual boat and country basis, from the French and Spanish purse seiners fishing in the Mediterranean Sea when the European Community's new regulations (effective 1993) permit EC fishing boats to land their catches at ports of any EC country. The collaboration of scientists of the pertinent EC Member States is essential to cover all these catches and to avoid double reporting.

6.b Improvement of the data collection system for the southwestern Atlantic

The Report of the Data Preparatory Meeting for the Southwest Atlantic Tuna Fisheries (SCRS/92/15) was reviewed. The Sub-Committee noted that as a result of the meeting, major improvements were made on Brazilian statistics. However, the Sub-Committee regretted that there were no participants from Argentina or Uruguay at the Data Preparatory Meeting.

Efforts are continuing to improve Brazilian current and historical statistics. The Sub-Committee was particularly interested in the substantial amount of biological data collected in the field in Brazil, which are not yet processed. The Sub-Committee recommended that these data be compiled as soon as possible and made available to the Committee.

6.c Collection of information on sharks

In referring to Document SCRS/92/10, the Secretariat explained that a circular was distributed in mid-July to request papers on shark statistics and biological and fishery information. In response, the Sub-Committee noted that several papers presented to the 1992 SCRS dealt with sharks in one way or the other.

The Sub-Committee reviewed these SCRS papers. It seems that there are many shark target fisheries in the Atlantic (mostly coastal or demersal species) as well as by-catch fisheries (including pelagic species). In terms of collecting statistics, it was noted that the collection of catch data on sharks was difficult, regardless whether they are target species or by-catch. With the exception of a few target fisheries, the catch data are only available for species combined, and even those combined catches are considerably under-reported.

The Sub-Committee prepared a simple questionnaire to summarize the availability of data on sharks, which is attached to this Report as Addendum 3.

6.d Expansion of computer facilities
and
6.e Availability of licensed software at the Secretariat

The Sub-Committee noted that the Secretariat's computer facilities (hardware and software) were not expanded at all in 1992, due to the financial problems of the Commission. Many of the analyses conducted by the scientists require more sophisticated computer equipment than in the past, and the Sub-Committee noted that the difficulties experienced by the scientists were, in part, due to the lack of more advanced hardware.

A small group was formed to study the hardware and software needs at the Secretariat and to establish the priorities of such needs.

This group later presented a report (attached as Addendum 2) summarizing the hardware and software needs. The Sub-Committee reiterated the recommendations of the group and strongly recommended that the secretariat follow the list of priorities and update the hardware and software, since the computer facilities are the core of the Commission's scientific work.

6.f Restructure the sampling strategy for the surface fishery

The Secretariat reported that the contracting of a short-term biostatistician, which had been proposed by the tropical tuna species groups in 1991 to study the

restructuring of the sampling strategy for the surface fishery, had not been realized for the same reason that the computer facilities had not been improved, i.e., because of financial constraints. The amount budgeted for this purpose was sufficient, but the corresponding funds were not available. The Sub-Committee noted that this still remains an important and unsolved problem. The absence of a revised design for sampling these surface catches could have an impact on the accuracy of the advice given to the Commission. The Sub-Committee urged that the proposal made in 1991 as regards contracting a biostatistician be met as soon as possible to solve the problem of restructuring the sampling strategy for the tropical surface fishery.

7. Date and Place of the Next Meeting of the Sub-Committee on Statistics

The Sub-Committee decided to meet during the 1993 SCRS Session and at the same place.

8. Other Matters

8.a Developing an international logbook

Dr. F. X. Bard noted the importance of logbooks for vessels participating in tropical fisheries, especially the Korean and Japanese vessels, and referred to the 1991 Sub-Committee recommendation to study the development of standard logbooks for Oriental longliners and purse seiners fishing in tropical waters (in the languages of these countries). The Secretariat noted that the baitboat logbooks in various languages were being distributed and asked that the requests for logs be made well in advance of their need, and that standard longline logbooks were available and were also being distributed. The Secretariat stated that purse seine logs in the necessary Oriental languages would be developed.

The Secretariat was asked to develop a prototype purse seine logbook, based on current baitboat logs and taking into consideration logbook forms currently used by various countries and organizations. This prototype should be sent to the scientists involved in the tropical tuna fisheries and, after being reviewed and improved, the logbook should be printed in the language of the fishermen, at Commission cost, and distributed to the fleets through the scientists.

8.b Cooperation with other organizations

The Report of the recent meeting of the Coordinating Working Party on the Atlantic Fisheries Statistics (COM-SCRS/92/7) was reviewed. The ICCAT extended an invitation to hold the next CWP session, scheduled for 1994, in Madrid, pending approval by the Commission. The Sub-Committee also noted that mutual assistance in improving the tuna catch base has been continued between FAO and ICCAT and that the system is quite satisfactory. At the same time, it approved the recommendation made by the CWP to provide tuna catch and effort data to ICES for their use in the ICCAT format.

The representative from FAO, in thanking the ICCAT Secretariat for its efforts to improve the tuna catch data base of his organization, stated that his department was now trying to recompile all the statistics for the high seas area through a newly-developed system in FAO, and requested the collaboration of ICCAT in compiling the tuna data.

The Sub-Committee thanked FAO for providing ICCAT with data for those countries for which the ICCAT has no data.

The Sub-Committee also thanked IATTC for providing biological sampling data on the Venezuelan surface fleet catches in the Atlantic.

9. Adoption of Report

The Sub-Committee adopted the Report.

10. Adjournment

The meeting of the Sub-Committee on Statistics was adjourned.

Table 1. Progress made in data collection (as of November 4, 1992)

Species, Gear & Country		Task I Catch Date Rec'd 1991	1992	BOAT	Task II Catch & Effort Date Rec'd 1991	1992	Biological (Size) Date Rec'd 1991	1992	Remarks
YFT, BET, SKJ - Surface Fleet									
BAITBOAT									
Angola		May 10	Apr 24	X	Jul 30				Preliminary Task I
Brazil		May 13	Jul 7		Mar 20	Oct 8		Oct 8	Size data for 1991
			Sep 8	X	Sep 11		Sep 11	Sep 14	Size-89; revised Task I
Brazil-Japan		May 13	Jul 7		Sep 11	Oct 8	Sep 11	Sep 14	Size data for 1989
			Sep 8	X				Oct 8	Revised Task I
Cape Verde		Nov 7	Jun 2			Jun 2	Nov 7		
Cuba			May 6						Task I for 1990
FIS		Jul 12	Jun 29		Jul 12	Jun 29	Jul 12	Jun 29	
Ghana			Jun 23		Mar 21				
Portugal	(Azores)	Oct 10	Jul 14		Oct 10	Jul 14	Oct 10		
	(Madeira)	Jun 6	Oct 26	X	Jun 6	Jul 1	Jun 6	Oct 8	Size data for BET
								Oct 27	Size data for SKJ
	(Mainland)								
South Africa		Aug 8	Aug 20	X	Aug 8	Aug 20			
			Aug 31			Aug 31			Revised data for 1987-88
Spain	(Canary Islands)	Jul 2	May 11	X	Jul 2	May 11	Jul 2	May 11	
	(Tropical)	Oct 17	Jul 24	X	Oct 18	Jul 24	Oct 18	Jul 24	
U.S.A.								Jan 16	Trans. data from Abidjan to P.Rico
Venezuela	(incl. foreign)		Sep 14	X	Mar 11	Apr 7	Mar 11	Apr 7	
			Nov 2	X	Mar 20				
PURSE SEINE									
Benin									
Cape Verde		Nov 7							
Cuba			May 6						Task I for 1990
FIS		Jul 12	Jun 29		Jul 12	Jun 29	Jul 12	Jun 29	
Japan		Jul 22	May 25		Jul 22	Feb 20	Aug 1		C/E data for 1989
						May 26			C/E data for 1991
Morocco		Jun 5	Jul 29						Task I for 1990 revised and 1991
Portugal	(Mainland)	Jul 8	May 21		Jul 8	May 21			
Spain	(Tropical)	Oct 15	Jun 17		Oct 25	Sep 23	Oct 30	Sep 23	Data for ETRO
		Oct 25							
			Jun 25			Sep 29			Data for WTRO
U.S.A.		Aug 23			Aug 23		Aug 23	Feb 20	Rev. YFT catch at size for 1990
								Jan 16	Trans. data from Abidjan to P.Rico
			Aug 6			Aug 19		Aug 19	Rev. data for 1988-90; data for 1991
Russia		Jun 27	Jun 25		Nov 12				
Venezuela	(incl. foreign)		Sep 14	X	Mar 11	Apr 7	Mar 11	Apr 7	
			Nov 2	X	Mar 20		**	**	
NEI-1		Jul 2	Jul 24						
UNCL & OTHERS									
Angola		Aug 20	Apr 24						Preliminary Task I for 1991
Argentina		Mar 11							
Barbados		May 16							
Benin		Jul 30							
Bermuda			Mar 20						Task I for 1983-91
			Mar 30						Task I for 1975-82
Brazil			Jul 7						
			Sep 8						
Brazil-Japan									
Cape Verde								Jun 2	
China (Taiwan)			Jan 30						Gill net Task I for 1990
Cuba									
Cape Verde		Nov 7					Nov 7		
Ghana									
Mexico		May 2							
Morocco		Jun 5	Jul 29						Task I for 1990 revised and for 1991
Portugal	(Madeira)								
	(Mainland)	Jul 8	May 21		Jul 8	May 21			
St. Helena		Sep 30	Jun 10	X	Sep 30	Jun 10			
St. Lucia		Nov 22		X					Task I and boats for 1990

Table 1. Continued

Species, Gear & Country		Task I Catch Date Rec'd 1991	1992	BOAT	Task II Catch & Effort Date Rec'd 1991	1992	Biological (Size) Date Rec'd 1991	1992	Remarks
South Africa		Aug 8	Aug 20 Aug 31		Aug 8	Aug 20 Aug 31			Revised data for 1987-88
Spain	(Peninsula)								
U.S.A.		Aug 23			Aug 23		Aug 23	Feb 20	Rev. YFT catch at size for 1990
						Jun 22		Jun 22	C/E and Size data for RR
			Aug 6			Aug 19		Aug 19	Rev. data for 1988-90 & data for 1991
Russia									
Venezuela							**		
Venezuela-Foreign							**		
ALB - SURF									
BAITBOAT									
Brazil		May 13	Jul 7						
			Sep 8	X					
Brazil-Japan		May 13			Sep 11				
France									
Italy								Sep 17	
Portugal	(Azores)	Oct 10	Jul 14		Oct 10	Jul 14	Oct 10		
	(Madeira)	Jun 6	Oct 26	X	Jun 6	Jul 1			
South Africa		Aug 8	Aug 20	X	Aug 8	Aug 20	Oct 31		
			Aug 31			Aug 31			Revised data for 1987-88
Spain	(Canary Islands)	Jul 2	May 11	X	Jul 2	May 11	Jul 2	May 11	
	(Peninsula)	Sep 5	Jun 8		Aug 8	Jun 8	Aug 8	Jun 8	TaskII not by 1°x1°, but by sampling area
								Jun 15	
Venezuela			Sep 14	X		Apr 7		Apr 7	
PURSE SEINE									
FIS									
France		Oct 23							
Italy									
Portugal	(Mainland)	Jul 8	May 21		Jul 8	May 21			
South Africa									
Spain		Jul 2	Jun 17						
Venezuela						Apr 7		Apr 7	
NEI-1		Jul 2							
TROL									
France									
Greece									
Spain	(Peninsula)	Aug 8	Jun 8		Aug 8	Jun 8	Aug 8	Jun 8	TaskII not by 1°x1°, but by sampling area
U.S.A.			Aug 6			Aug 19		Aug 19	Rev. data for 1990 & data for 1991
UNCL & OTHERS									
Argentina		Mar 11							
Brazil									
China (Taiwan)			Jan 30						Gill net Task I for 1990
France	(Bay of Biscay)	Oct 2	Jul 24	X	Oct 4	Jul 24	Oct 4	Jul 24	TaskII not by 1°x1°, but by sampling area
	(Mediterranean)	Oct 23							
Greece									
Italy		Sep 9						Sep 23	
Portugal	(Azores)								
	(Madeira)								
	(Mainland)	Jul 8	May 21		Jul 8	May 21			
St Helena		Sep 30	Jun 10	X	Sep 30	Jun 10			
South Africa		Aug 8	Apr 23		Aug 8				Preliminary Task I for 1991
Spain	(Peninsula)								
	(Mediterranean)	Jul 29			Jul 29				
U.S.A.		Aug 23	Aug 6		Aug 23	Aug 19	Aug 23	Aug 19	Rev. data 1988-90; data for 1991
						Jun 22			C/E for RR
Venezuela									
Venezuela-Foreign									
BLUEFIN - SURF									
BAITBOAT									

Table 1. Continued

Species, Gear & Country		Task I Catch Date Rec'd 1991	1992	BOAT	Task II Catch & Effort Date Rec'd 1991	1992	Biological (Size) Date Rec'd 1991	1992	Remarks
France	(Bay of Biscay)	Oct 2	Oct 27						Task I for 1991 & 1990 rev.
Portugal	(Azores)								
	(Madeira)	Jun 6			Jun 6				
	(Mainland)								
Spain	(Canary Islands)	Jul 2	May 11		Jul 2	May 11	Jul 2	May 11	
	(Bay of Biscay)	Jan 23	Mar 17		May 20	Mar 17	Jan 23	Mar 17	
PURSE SEINE									
Croatia			Jul 27			Jul 27			Task I 1991; prelim. Task I 1992
France	(Mediterranean)	Oct 23	Sep 7			Sep 10	Oct 22	Sep 10	Preliminary data for 1991
Italy									
Morocco		Jun 5	Jul 29						Task I for 1990 revised and for 1991
Portugal	(Azores)								
	(Mainland)	Jul 8			Jul 8				
Spain			Aug 26			Aug 26			Data for 1985-91
Tunisie			Sep 23						Task I for 1990-91; prelim. for 1992
U.S.A.		Aug 23	Oct 26		Aug 23		Aug 23	Oct 30	Size & catch-by-size data for 1991
NEI-2			Sep 23						
TRAP									
Canada		Oct 17					Oct 21		
Morocco		Jun 5	Jul 29						Task I for 1990 revised and for 1991
Spain	(Mediterranean)	Jul 29	Aug 26		Jul 29	Aug 26	Jul 29		
	(Peninsula)	Jul 29	Aug 26		Jul 29	Aug 26	Jul 29	Aug 26	
Tunisie			Sep 23						Task I for 1990-91; prelim. for 1992
UNCL & OTHERS									
Argentina		Mar 11							
Canada		Oct 17	Jun 12				Oct 21		Prel. Task I for 1991
France	(Mediterranean)	Oct 23	Sep 7						Prel. Task I for 1991
	(Bay of Biscay)		Oct 27						Task I for 1991 & 1990 rev.
Greece			Jul 21						
Italy			Sep 23					Sep 23	
Morocco			Jul 29						Task I 1990 revised and for 1991
Portugal	(Azores)								
	(Madeira)	Jun 6							
	(Mainland)	Jul 8	May 21		Jul 8	May 21			
St. Lucia		Nov 22		X					Task I and boats for 1990
Spain	(Mediterranean)	Jul 29	Aug 26		Jul 29	Aug 26	Jul 29	Aug 26	Data for 1989-91
	(Peninsula)								
Tunisie			Sep 23						
U.S.A.		Aug 23	Oct 26		Aug 23	Jun 22	Aug 13		C/E for RR. Task I 1991 & 1990 rev.
								Oct 30	Size & catch-by-size data for 1991
BILLFISH (incl. SWO) SURFACE									
Argentina									
Benin		Jul 30					Jul 30		
Bermuda			Mar 20						Task I for 1983-91
			Mar 30	X					Task I for 1975-82
Brazil			Jul 7						
			Sep 8	X					
Canada		Apr 25	Jun 23	X	Jun 19	Jun 23	Jun 19	Jun 23	Size & catch-by-size data for SWO
			Oct 8						Revised SWO catch for 1988
China (Taiwan)			Jan 30						Gillnet Task I for 1990
Cyprus		Aug 8			Aug 8				
France	(Bay Biscay)	Oct 2							
Ghana									
Italy			Sep 23					Sep 23	Size data for 1990-91
Malta			Sep 23						
Morocco		Jun 5	Jul 29						Task I for 1990 revised and for 1991
Portugal	(Madeira)	Jun 6	Oct 26	X	Jun 6	Jul 1		Oct 27	Size data for SWO
	(Mainland)	Jul 8	May 21		Jul 8	May 21			
Senegal									
South Africa		May 7	Aug 20						

Table 1. Continued

Species, Gear & Country		Task I Catch Date Rec'd 1991	1992	BOAT	Task II Catch & Effort Date Rec'd 1991	1992	Biological (Size) Date Rec'd 1991	1992	Remarks
			Aug 31						Revised data for 1987-88
Spain	(Canary Islands)	Jul 2	May 11	X	Jul 2	May 11			
	(Mediterranean)	Jul 29	Aug 26		Jul 29	Aug 26	Jul 29	Aug 26	
	(Peninsula)	Jul 29	Aug 26		Jul 29	Aug 26	Jul 29	Aug 26	
U.S.A.		Jul 2	Jun 26		Aug 23	Aug 19	Jul 2	Aug 19	BIL Task I; Task II rev. 1988-90;Task II for 1991
						Jun 22	Jul 2	Jun 22	C/E and Size data for RR
			Jul 3			Jul 3		Jul 3	SWO for 1990-91, incl. catch-by-size
Russia							Jul 2		
Venezuela								**	
SMALL TUNAS - SURF									
Angola		May 10	Apr 24		Jul 30				Preliminary Task I
Barbados		May 16							
Benin		Jul 30			Jul 30		Jul 30		
Bermuda			Mar 20						Task I for 1983-91
			Mar 30	X					Task I for 1975-82
Brazil		Nov 7	Jul 7			Jun 2	Nov 7	Jul 1	Size data for 1963-86
			Sep 8	X		Oct 8		Oct 8	
Croatia									
Cuba			May 6						Task I for 1990
FIS									
Ghana									
Greece			Sep 23						
Malta			Mar 31	X					Task I for 1991; quick ests. for 1992
Mexico		May 2							
Morocco		Jun 5	Jul 29						Task I for 1990 revised and for 1991
Portugal	(Azores)	Oct 10	Jul 14		Oct 10	Jul 14	Oct 10		
	(Madeira)	Jun 6	Oct 26	X	Jun 6	Jul 1			
	(Mainland)	Jul 8	May 21		Jul 8	May 21			
St. Lucia		Nov 22							
Spain	(Canary Islands)	Jul 2	May 11	X	Jul 2	May 11			
	(Mediterranean)	Jul 29	Aug 26		Jul 29	Aug 26			
	(Peninsula)	Jul 29	Aug 26		Jul 29	Aug 26		Aug 26	
	(Tropical)	Oct 15	Jun 17						
			Jun 25						
U.S.A.		Aug 23	Aug 6		Aug 23	Aug 19	Aug 23	Aug 19	Rev. data for 1988-90; data for 1991
Russia		Jun 27	Jun 25		Nov 12				
Venezuela			Sep 14	X		Apr 7		Apr 7	
			Nov 2	X					
NEI-1		Jul 2	Sep 23						
NEI 2			Sep 23						
LONGLINE - ALL SPP.									
Algeria		Aug 8	Sep 23				Aug 8		
Brazil		May 13	Jul 7		Mar 20			Jul 1	BIL size for 1971-86
			Sep 8	X				Sep 1	BIL size for 1985-89
					Nov 7		Nov 7	Sep 11	Size data for 1983-86
								Oct 8	Size data for YFT
								Oct 21	Size data for SAI 1987-89
Brazil-Japan		Nov 7	Jul 7	X	Mar 20		Mar 20		Task I data for 1977-91
			Sep 8		Nov 7	Aug 27		Aug 27	Prelim. Task I-1991;C/E 1978-79; size 1982 & 1987
					Sep 11	Sep 11			C/E data for 1977-83 and 1991
						Oct 8		Sep 11	Size data - 1977-81, 1983-86, 1988.
								Sep 30	Size data for WHM 1988-89.
Brazil-Honduras			Oct 8	X		Oct 8		Oct 8	
Brazil-Taiwan			Jul 7	X		Sep 11			Preliminary data
			Sep 8						
Canada		Apr 25	Jun 12		Jun 19		Jun 19		Preliminary Task I for BFT
		Oct 17	Jun 23	X		Jun 23	Oct 21	Jun 23	Size & catch-by-size data for SWO
			Sep 18						Task I for YFT, BET, ALB
			Oct 8						Revised SWO catch for 1988
China (Taiwan)		Mar 11	Jan 30		Oct 4	Jan 30	Oct 4		Task I and C/E for 1990
			Jul 21	X			Nov 27		Preliminary Task I for 1991
								Sep 10	Albacore size data

Table 1. Continued

Species, Gear & Country		Task I Catch Date Rec'd 1991	1992	BOAT	Task II Catch & Effort Date Rec'd 1991	1992	Biological (Size) Date Rec'd 1991	1992	Remarks
						Oct 26		Oct 26	Task II data for 1989-91
Cuba		Aug 14	May 6						Task I for 1990
Cyprus		Aug 8	Jul 16	X		Jul 16			SWO data
Greece			Jul 21			Sep 23		Jul 21	SWO Task II data for 1990-91
Italy			Sep 23					Sep 23	
Japan							Apr 1	May 21	Size data for 1990
		Jul 22	Sep 16		Jun 21	Sep 16			Rev. Task I 1990 & C/E 1990.
		Aug 29					Aug 1	Sep 16	SWO catch-by-size 1990 rev. & 1991 prelim.
							Oct 14	Sep 23	BFT catch-by-size 1990 rev. & 1991 prelim.
			Oct 21					Oct 21	BFT East catch-by-size 1990
			Oct 23						SBF Task I 1990 rev. and 1991 prelim.
Japan-Canada-Observer									
Japan-S.Helena-Observer		Sep 30	Jun 10		Sep 30	Jun 10			
Japan-U.S.-Observer									
Korea		Sep 10	Sep 2	X	Sep 10	Sep 2	Sep 10	Sep 2	
Malta			Mar 31	X					Task I for 1991; quick esta. for 1992
Mexico									
Morocco		Jun 5	Jul 29						Task I for 1990 revised and for 1991
Panama									
Portugal	(Azores)	Oct 10	Jul 14		Oct 10	Jul 14	Aug 28		
	(Madeira)	Jun 6	Oct 26	X	Jun 6	Jul 1			
	(Mainland)	Jul 8	Jun 22		Jul 8	Jun 23			
South Africa		Aug 8	Aug 31						Revised data for 1987-88
Spain	(Mediterranean)	Jul 29	Aug 26		Jul 29	Aug 26	Jul 29	Aug 26	SWO data for 1989-91; BFT for 1991
	(Peninsula)	Jul 23	Aug 19		Jul 23	Aug 19	Jul 23	Aug 19	SWO data
Uruguay		Aug 6	Jul 2	X					Task I 1991; rev. data 1981-90
U.S.A.		Jul 2					Jul 2	Feb 20	Rev. YFT catch-by-size for 1990
		Aug 23			Aug 23	Jan 16	Aug 23		WAH C/E data for 1990
			Jun 26			Jun 22	Aug 23	Jun 22	Task I estimates BIL 1991
			Jul 3			Jul 3		Jul 3	SWO 90-91, incl. catch-by-size
			Aug 6			Aug 19		Aug 19	Rev. data for 1988-90; data for 1991
			Oct 26					Oct 30	Task I, size & catch by size for BFT 1991
Russia		Jun 27			Nov 12				
Venezuela			Sep 14	X			**	**	
Venezuela-Foreign							**	**	
NEI-1		Jul 2	Sep 23						
NEI-2			Sep 23						
VARIOUS:									
FAO		Mar 6	Mar 11						
		Apr 19	May 21						Task I for 1971-90
		Sep 4	Aug 7						SWO catches
		Oct 10	Sep 9						
		Nov 27	Sep 17						
			Sep 30						
			Oct 9						
U.S.A. Tournament data								Aug 3	Size data for 1971-91
									BFT, YFT, SAI, BUM, WHM, SWO, SPF, BIL
								Oct 26	

** Field reports periodically.

Addendum 1 to Appendix 7 to Annex 14

AGENDA OF THE SUB-COMMITTEE ON STATISTICS

1. Opening of the meeting
2. Adoption of Agenda and arrangements for the meeting
3. Review of national statistics

   3.a Data collection and reporting
   3.b Improvements to be made

4. Examination of the Secretariat's statistical work in 1992

   4.a Data processing carried out in 1992
   4.b Port sampling program
   4.c Secretariat data management policy
   4.d Dissemination and publication of data
   4.e Other matters

5. Examination of the problem of unreported catches by non-Contracting Parties
6. Review of the progress made on recommendations for statistics (as contained in the 1991 SCRS Report), and future plans

   6.a Improvement of Mediterranean statistics
   6.b Improvement of the data collection system for the southwestern Atlantic
   6.c Collection of information on sharks
   6.d Expansion of computer facilities
   6.e Availability of licensed software at the Secretariat
   6.f Restructure the sampling strategy for the surface fishery

7. Date and place of the next meeting of the Sub-Committee on Statistics
8. Other matters
9. Adoption of Report
10. Adjournment

Addendum 2 to Appendix 7 to Annex 14

REPORT OF THE WORKING GROUP ON COMPUTER NEEDS

The Sub-Committee on Statistics convened a small group to review the computer needs of the ICCAT Secretariat, especially with respect to the needs of scientists meeting at the Secretariat and conducting analyses. The Group reviewed software and hardware needs, and recommended that the Sub-Committee review these needs annually.

The scientific software for use by SCRS scientists in assessments are listed in Addendum Table 1; additional software considered essential for current assessment activities are listed in Addendum Table 2.

The Group noted that at minimum a fast computer and a laser printer capable of handling graphics were needed. The computer should at least be capable of handling VGA graphics to facilitate use of graphics intensive, interactive programs (STAATS, the VPA program used by many working groups) and it should be fast to handle both GLM and simulation analyses as rapidly as possible under DOS (486 DX 33 mhz, 8 MB RAM expandable to at least 16 MB, with at least 200 MB hard drive). The laser printer is essential to permit printing of the wide variety of documents and figures generated during meetings to avoid having to repeatedly interrupt the Secretariat staff. Two printer switch boxes, if possible with memory, should be purchased to facilitate access by more than one user, to the laser printer to be purchased and the other graphics-capable printer at the Secretariat.

The Working Group also recommended that the power stabilizer (UPS) used to protect the Secretariat's primary computer system (useful, though obsolete) be replaced. Apparently it requires frequent expensive repair. The Group considered this need to be extremely urgent.

An additional need the Group noted was a math co-processor for a Secretariat computer for faster running of mathematical and spread sheet applications.

Addendum Table 1. Computer software needed at the Secretariat for scientific meetings

Software	*Computer Programmer*	*Date*
ADAPT	Powers	1989
ADAPT	Conser	1990
Fortran (STAATS)	Restrepo	Oct. 92
Basic (STAATS)	Powers	Sept. 92

Addendum Table 2. Basic computer software essential at the Secretariat to support stock assessment work

Commercial Software	*Non-Commercial Software*
S.A.S.	Generic cohort analysis
MicroSoft Fortran compiler	Laurec-Shepherd (VPA)
Quick Basic	XSA (VPA)
	ASPIC
	PRODFIT
	FAO's production model software

Summary of the Preliminary Questionnaire on Sharks

Countries	*Does your country have a directed shark fishery?*	*Does your country have fisheries catching shark as by-catch?*	*Does your country collect shark statistics?*
Brazil	Yes	Artisanal, TRAW	Yes, for part of the fisheries, collected in the same stratum as tuna. For many others, statistics are combined with other species.
Côte d'Ivoire	GILL, Canoe	PS	PS by-catch is discarded and limited data collected. Gill see SCRS/92/148.
España	No	Yes	Some limited data and scientific papers. Mostly species combined.
France	No	GILL, MWTD, PS	No
Ghana	Yes	Yes	No
Guinea, Rep. of	Artisanal	No	No
Japan	No	LL	Yes. Generally shark species combined. In number by 5° area, by month.
Korea	No	LL	Yes. All species combined and total catches only.
Morocco	LL (artisanal)	SURF	Yes. All species combined by port and month.
Portugal	Yes	Yes	Yes. By species, area and time.
South Africa	HAND, LL	TRAW, LL, HAND	Yes. HAND 50%: TRAW 10%: LL ? By species grouping and month. Most sharks are discarded (particularly small species).
United States	Yes	Yes	Yes. Landings by port and month. Most species combined.
Venezuela	Minor	LL	Yes. Total catch of combined species by area and time.
CARICOM	GILL	LL and GILL, HAND	Yes. By country. All sharks combined.
Libya	Yes	Yes	No.
Mauritania	No	Yes	Unknown.
Taiwan	No	LL, GILL, TRAW	Yes. All species combined.

Appendix 8 to Annex 14

REPORT OF THE SUB-COMMITTEE ON ENVIRONMENT

1. Opening

The meeting of the Sub-Committee on Environment was held on November 5, 1992, at the Hotel Pintor in Madrid. Mr. J. Pereira (Portugal), Convener of the Sub-Committee, who led the discussions, welcomed all the participants.

2. Adoption of Agenda and Arrangements for the Meeting

The Tentative Agenda was adopted and is attached to this Report as Addendum 1. Dr. J. M. Stretta (France) served as rapporteur.

3. Review of Contribution Papers

Three groups of SCRS documents dealt, in detail or partially, with subjects concerning the Sub-Committee on Environment.

- Documents dealing with the environment of tunas: SCRS/92/118, 130, 134 and 156
- Documents dealing with anomalies of the environment: SCRS/92/157
- Documents dealing with tuna fishing in association with floating objects: SCRS/92/-39, 45, 120, 141, 149 and 151

During the general discussion following the presentation by the authors of the documents dealing with the environment and anomalies, surface temperature was confirmed as an explanation for the micro-distribution of tunas. For the first time in the area of tunas, the "surface temperature" parameter is integrated in the production models. However, the surface temperature is not the only explicative variable in tuna distribution. In fact, the concept of the depth of the homogeneous layer and the depth of the thermocline are taken into account in explaining the fluctuations in the catch rates of tunas in the same area between years. Thanks to meteorologic satellites and merchant vessels, the surface temperature parameter in quasi-real time is a parameter that is accessible to the scientific community. However, the "temperature according to depth" is a rare parameter and is difficult to have access to unless within a large data bases.

To explain the annual fluctuations in Atlantic albacore fishing, the Delegate of Spain recalled a preliminary study of thermal data from spatial remote sensing and from fisheries data.

4. Examination of Possible Access to Existing Data Bases on the Environment

Following a recommendation made by the Sub-Committee on Environment in 1991 to have the ICCAT Secretariat centralize information on the data bases existing throughout the world, the Secretariat distributed a circular in July, 1992, to SCRS scientists requesting information on these bases. To date, some responses have been received by the Secretariat but no action was taken to solicit access from the Secretariat computer to these data bases. The Sub-Committee reiterated this recommendation, which is considered crucial.

5. Anomalies in Oceanic Conditions in Recent Years

Other than document SCRS/92/157, which dealt with the problem of anomalies, no work was presented this year. The variations in oceanographic conditions could explain the significant fluctuations in the catch rates and/or the catches of tunas. The study of these anomalies, which could cause serious errors in the analysis of the state of stocks and in the management of the resource, must be encouraged.

6. Ecology of Tunas

6.1 Association with floating objects

In the east Atlantic, up to 1990, 15 percent of the catches were made in association with natural floating

objects. Due to the introduction of artificial floating objects, this percentage has increased rapidly. In the Indian Ocean, 50 percent of the catches are taken with the help of floating objects.

The species composition under floating objects seems stable and an average of 76 percent skipjack, 17 percent yellowfin, and 7 percent bigeye is observed. However, this association only concerns small-sized tunas and incidental species. The behavior of pelagic fish in relation to floating objects remains an enigma. The 1992 scientific meetings held in La Jolla in February (organized by IATTC and financed by the Bumblebee Seafood Company) and in Montpellier in June (organized by ORSTOM) were limited to noting this curiosity without providing satisfactory explanations. On the other hand, the low rate of failure in fishing for tunas associated with floating objects signifies an important development in this type of fishing and this raises a number of problems. At present, the abundance indices are based on vessel searching time. What will occur in these indices when fishing using floating objects is introduced?

Indeed, numerous questions are raised about fishing with floating objects and new areas of research are opening. Document SCRS/92/120 lists new research activities. The FAO expressed interest in participating in these new research areas, but clarified that it cannot finance them.

It was pointed out that there is a difference in the problems between fishing with floating objects in the Atlantic and in the eastern Pacific. In the latter region, research is oriented towards finding aggregating systems that can provide an alternative to fishing methods used to catch large yellowfin associated with dolphins.

Brazil began studies on the association of tunas with floating objects and reported this year on an experiment carried out in the northeast region of Brazil involving fishing on floating objects with small artisanal units.

6.2 Association with other marine animals

The Delegate of Venezuela brought up the problem of purse seine fishing in association with marine mammals and proposed putting into effect a program to study this association. This program would be based on the presence of observers on board all the tuna purse seiners.

During the discussions on this subject, it was noted that the problem of tuna fishing associated with dolphins had already been studied by the SCRS in the past and that there is no fishing of dolphins by purse seiners in the Atlantic as there is in the eastern Pacific region. In the intertropical and temperate areas of the Atlantic and the Mediterranean, the association between tunas and dolphins is rarely encountered. The cost of a program which includes the presence of an observer on every tuna vessel would not be compensated for due to the scarcity of the problem of associations between tunas and dolphins in the Atlantic.

There was a consensus that the Sub-Committee on Environment should be aware of the problem of the association between tunas and dolphins. Moreover, the observer from the EC suggested that the Sub-Committee also be concerned with the interactions between different fishing gears exploiting tunas and other protected animals (turtles and marine mammals).

The observer of the EC reported that on October 19, 1992, the Council of Ministers of the EC decided to prohibit all vessels with flags of EC Member States from purse seine fishing on groups of marine mammals in any ocean where they may operate.

7. Review of Studies on the Effect of the Environment on Tuna Ecology and the Conclusions of Various International Meetings on the Environment

This item was discussed under Agenda Item 6.

8. Working Plan for the Sub-Committee

For the short term, the Sub-Committee proposed that each country present a report next year on the interactions between tunas and marine mammals and turtles, in a manner similar to that done this year for incidental catches of sharks. The objective of the questionnaires will be to estimate better the importance of these interactions in the Atlantic.

The Sub-Committee recommended initiating studies on integrating environmental data to the assessments.

For the medium term, the Sub-Committee recommended that, in order to meet the objectives of ICCAT, priorities be established to promote work on the environment, anomalies, and fishery and ecological aspects of fishing associated with floating objects.

Increased world cooperation should be investigated the SCRS to carry out its research.

9. Date and Place of the Next Meeting of the Sub-Committee on Environment

The next meeting of the Sub-Committee on Environment will be held at the same place and on the same dates as the next SCRS meeting.

10. Other Matters

No other matters were discussed.

11. Adoption of Report

The Sub-Committee adopted the Report.

12. Adjournment

The meeting of the Sub-Committee on Environment was adjourned.

Addendum 1 to Appendix 8 to Annex 14

Agenda of the Sub-Committee on Environment

1. Opening of the meeting
2. Adoption of Agenda and arrangements for the meeting
3. Review of contribution papers
4. Examination of possible access to existing data bases on the environment
5. Anomalies in oceanic conditions in recent years
6. Ecology of tunas (association with floating objects, with other marine animals, gear selectivity, species interactions, by-catches, etc.)
7. Review of studies on the effect of the environment on tuna ecology and the conclusions of various international meetings on the environment
8. Working plan for the Sub-Committee
9. Date and place of the next meeting of the Sub-Committee on Environment
10. Other matters
11. Adoption of Report
12. Adjournment

Appendix 9 to Annex 14

REVIEW OF THE PROGRESS MADE BY THE BLUEFIN YEAR PROGRAM (BYP)

1. Background

The ICCAT Bluefin Year Program (BYP) was adopted by the Standing Committee on Research and Statistics (SCRS) and approved by the Commission at its 1991 meetings. The Program is designed for the purpose of improving the statistics, basic biology, ecology and population dynamics of Atlantic bluefin tuna, which has been under strict fisheries regulations.

The Program covers a vast field of research and statistics. However, due to the financial constraints of the Commission, funds for the Program could not be obtained from the Commission budget, so it was decided to solicit funding from national and private sources. Unfortunately, up to now, there have been no offers of funding for the BYP. Therefore, the Program depends entirely on national research activities. However, as described later in this Report, the EC-sponsored research program in the Mediterranean for large pelagics is expected to provide significant input for the BYP and as well as for GFCM and EEC, provided close cooperation is maintained among ICCAT, GFCM and the EC.

To facilitate the progress of the BYP, two coordinators were nominated, Mr. Ziro Suzuki for the west Atlantic and Mr. Bernard Liorzou for the east Atlantic including the Mediterranean Sea. These two scientists were originally nominated for feasibility studies of the BYP before initiation of the Program but they have continued serving as coordinators of the BYP.

As mentioned earlier, the Bluefin Year Program is a comprehensive program and the items listed in the proposal of the BYP have not changed. However, it should be noted that the breeding and stock re-stocking items, to which "low" priority was originally assigned, should now be regarded as "high" priority items, due, in part, to issues related to CITES. In fact, at present there are national projects concerning this subject already being implemented.

2. Initiation of BYP Circulars

For the convenience of all scientists involved with the BYP and Atlantic bluefin studies, BYP circulars have been distributed, the first one on July 15, 1991, the second on September 4, 1991. The coordinators plan to continue to distribute BYP circulars among the concerned scientists, on an opportunistic time basis. In line with this, the coordinators should be informed which scientists would like receive the BYP circulars. Therefore, those who want to be on the mailing list for the BYP circulars were requested to provide their names, addresses, and phone, Fax and telex numbers. A copy of this request should be sent to the ICCAT Secretariat.

The addresses of the BYP coordinators are as follows:

Mr. Ziro Suzuki (west Atlantic)
National Research Institute of
of Far Seas Fisheries
7-1 Orido, 5 Chome
Shimizu-shi, Shizuoka 424 Japan
Tel: 0543-34-0715
Fax: 0543-35-9642
Tlx: 03965689

Mr. Bernard Liorzou (east Atl. & Med.)
IFREMER
1, rue Jean Vilar
34200 Sète, France
Fax: 33-6774-7090

3. Review of National Research Plans

In response to an enquiry from the coordinators on the latest information of each country's plan to carry out the BYP, the U.S., Canada, Spain and Japan sent their respective work plans to the coordinators.

The work plan of the U. S. for 1991-1992 is summarized as follows:

i) Improvement in statistics & other data bases

Under this category, there is a study planned to improved methods to estimate the partial recruitment

pattern, update or develop the large-, medium- and small-fish abundance indices from various fisheries, develop an abundance index from aerial surveys, develop a time series data base on Atlantic purse seine statistics, etc.

ii) Activities related to stock structure

These activities include mtDNA methods and intensified tagging.

iii) Reproductive biology and other biological studies

As for research on reproductive biology, it is anticipated that more intensive research can be undertaken in 1992-1993 through the newly-established research program with the New England Aquarium on captive rearing of bluefin. Further development of biological specimens for maturity, fecundity, age and growth analyses and stock identification studies will be investigated.

b) Canada has unique plans, such as scientific tagging for giant bluefin in the Hell Hole, to estimate absolute numbers in that location and histological analysis of gonads for reproductive biology. Identification of non-reported catches and establishment of a common tag/recapture file are also important subjects to be worked out.

c) The Spanish plan covers several critically important subjects. Among them, the intensified tagging on juvenile bluefin tuna in the western Mediterranean should be noted. Reproductive studies on first maturity and fecundity will be continued through sampling of trap-caught fish. Ageing studies by spines are planned to be improved by adding more samples taken from all seasons.

d) Japan will contribute to several research items of the BYP, in particular, genetic analysis of stock structure and reproductive biology with histological analysis of gonads. It should be noted that in 1992 spawning of pen-cultured bluefin tuna (5-6 years old) was carried out in several areas along the Japanese southern coast and in some places it was reported that several thousand fish grew at least 4-5 cm. This information will be useful for reproductive biology and restocking of the stock. In 1992, the sampling of spines and vertebrae for improvement of ageing was also started from longline boats operating in the northwestern Atlantic.

4. Ad hoc Meeting for the Exchange of Information on Atlantic Bluefin *Tuna Research*

During the Second GFCM/ICCAT Expert Consultation on Stocks of Large Pelagic Fishes in the Mediterranean Sea (Crete, September, 1992), an informal meeting was organized to exchange information among ICCAT, GFCM, and EC on studies of Atlantic bluefin tuna. The meeting was meaningful since scientists interested in Atlantic bluefin, from ICCAT Contracting Parties as well as from non-Contracting Parties joined in the discussions about possible future coordination of research.

The EC-sponsored work plan for studies on large pelagics in the Mediterranean was briefly introduced. The objective of this project is to collect as much information as possible concerning the biology and fishing of bluefin, albacore, bonito and swordfish in the Mediterranean. The countries participating in the project are Spain, Italy, Greece and France. The project covers three years, starting in July, 1992.

Many of the same subjects are being studied in both the ICCAT BYP and the EC project and it was felt that the coordination of research between the two projects would be mutually beneficial. In this regard, it should be noted that the Second GFCM/ICCAT Joint Consultation requested both Secretariats to establish an "*Ad Hoc* Working Group on Large Pelagic Fishes" and to define the terms of reference for this *ad hoc* group.

Reproductive biology on fecundity and size-at-first maturity and improvement of growth studies are thought to have relatively high prospects for obtaining positive results within a limited time period, if there is adequate coordination among the ICCAT, GFCM and EC projects on bluefin tuna. Therefore, it was tentatively agreed that the Spanish Institute of Oceanography (IEO), under the leadership of Dr. J. L. Cort, would act as the central base of these studies in the eastern Atlantic and Mediterranean in carrying out and coordinating actual research. Similar arrangements for the western Atlantic should be made in consultation among the Japanese, U.S. and Canadian scientists during the 1992 SCRS.

Appendix 10 to Annex 14

1993 PROGRAM PLAN FOR THE ICCAT ENHANCED RESEARCH PROGRAM FOR BILLFISH

The original plan for the Enhanced Research Program for Billfish (SCRS 1986) included the following specific objectives: (1) To provide more detailed catch and effort statistics (particularly size frequency data); (2) To initiate the ICCAT tagging program for billfish; and (3) To assist in collecting data for age and growth studies. The plan was initially formulated with the intention of developing the data necessary to assess the status of the billfish stocks. This goal was at least partially fulfilled with the stock assessments for blue marlin accomplished at the Second ICCAT Billfish Workshop in July, 1992, and later with the white marlin assessment submitted to the 1992 SCRS (SCRS/92/127). However, many of the data acquisition problems remain and maintenance of important elements of the billfish data bases to insure uninterrupted time series requires the Enhanced Billfish Research Program to be continued and expanded in critical areas as recommended by the Workshop (SCRS/92/16).

It was confirmed that Drs. Bradford Brown and Eric Prince (U.S.A.) will continue to function as the General Coordinator and West Atlantic Coordinator, respectively. Drs. Taib Diouf (Senegal) and Martin Mensah (Ghana) will continue to be the Co-Coordinators for the east Atlantic Ocean. Research results, as well as financial summaries for 1992 were presented to the 1992 SCRS and Commission meetings (SCRS/92/12, 24, 70, 75 and 146).

The summary of the 1993 proposed budget is attached as Table 1. Quarterly highlight reports of research activities will continue to be provided to interested parties. In addition, names and addressees of individuals receiving the reports and those involved or interested in the research program will continue to be available upon request. Projected funds for future research activities will be available in subsequent annual plans.

All agencies and/or personnel receiving ICCAT funding from the Billfish Program are required to summarize annual expenditures of funds to the Commission and research activities either in the form of a working document to the SCRS or a report to the Program Coordinators. In addition, all funded participating cooperators in this Program will be required to submit data either to area Coordinators or directly to the ICCAT Secretariat collected in previous years.

a) Species identification kits

The report on the development of field species identification kits for istiophoridae has been encouraging (SCRS/92/56). A demonstration of the most recent advances in kit technology was presented to the Billfish Workshop in the form of a demonstration using monoclonal antibodies isolated for Atlantic sailfish and testing sailfish tissue in a "blind" test with tissue from four other species of teleosts, including blue and white marlin and swordfish. No false positives were reported (i.e. the Billfish Workshop correctly identified sailfish). The research team reported that a grant from the National Marine Fisheries Service (NMFS) will help accelerate the rate of completion for this work, probably by the end of 1992 (provided biological samples for blue marlin and white marlin can be obtained in a timely manner). Funds from the Enhanced Research Program for Billfish will not be required to finalize this work for 1993.

b) Shore-based sampling

Cumaná, La Guaira, Margarita Island, and Puerto La Cruz, Venezuela. Shore Based sampling of size frequency data for billfish carcasses off-loaded from industrialized longline boats at the port of Cumaná will be continued in 1993. Funding will be $320 since some of this activity occurs on weekends and after normal working hours. Sampling industrialized longline boats and artisanal fisheries in Puerto La Cruz, Margarita Island, and La Guaira will be

conducted in 1993 and the requested funding for these segments is as follows: Puerto La Cruz $160; Margarita Island $864; and La Guaira (including Playa Verde) $1152. Several trips by the West Atlantic Coordinator or his designee (Mr. Freddy Arocha, U.D.O. now studying in Miami, Florida) will be necessary to organize sampling, collect data, and transport biological samples to Miami in 1993. An additional $750 will be required for tag recapture rewards that are made by FONAIAP staff (see Billfish Tagging Section d).

Caracas, Venezuela. Shore-based sampling and detailed analysis of the recreational fishery (centered in La Guaira, Venezuela) will be continued in 1993. This sampling includes coverage of 10 recreational billfish tournaments held in Playa Grande Marina and other Venezuelan locations. Requested funding for this activity in 1993 is $1200 since much of this sampling is conducted on weekends. Shore-based sampling in all Venezuelan locations, as well as at-sea sampling (see next section) in Venezuela will be coordinated by Mr. Louis Marcano of FONAIAP.

Grenada. Shore-based sampling of size frequency and total landings from the artisanal and recreational fishery for billfish will be continued by the Ministry of Agriculture, Lands, Forestry, and Fisheries (Mr. Crofton Isaac and Mr. Paul Phillip) in 1993. Shore-based sampling activities will start in early November, 1992, to coincide with the start of the pelagic fishery at this location. At-sea sampling on the new longline vessels received last year from a Japanese company are discussed in the next section. Requested funding for 1993 is $1500.

Jamaica. Shore-based sampling of the size frequency, total landings, and catch and effort statistics from the recreational fishery will continue in 1993. Efforts will also be made to obtain these data from the artisanal canoe fishery as well. Requested funding for 1993 is $1000.

St. Maarten, Netherlands Antilles. Shore-based sampling of size frequency data for off-loaded billfish carcasses from longline vessels will be continued in 1993 through the Nichirei Carib Corporation. Requested funding for this in 1993 is $1000. Shore-based sampling of the annual recreational billfish tournament, initiated in 1992, will be continued in 1993 by the West Atlantic Coordinator. Since this tournament will contribute air faire and hotel accommodations for the week of the tournament, the West Atlantic Coordinator will also assist Nichirei Carib employees in sampling during his stay on the island. Thus, funds for this latter activity will not be required from the Program.

Trinidad and Tobago. Shore-based sampling of size frequency data for off-loaded billfish carcasses from China-Taiwan and Trinidadian longline vessels will be continued in 1993. This work is being supervised by Ms. Christine Henry of the Ministry of Food Production and Marine Exploitation (Fisheries Division). At least one trip by the West Atlantic Coordinator will be necessary to train samplers and assist in organizing field research activities. Requested funding for 1993 is $2000.

Cozumel, Mexico. Shore-based sampling of the recreational fishery for billfish in the Mexican Caribbean area, particularly from Cozumel and possibly Cancun, will be initiated in 1993 under direction of the staff of the Mexican Billfish Foundation. Requested funding for 1993 is $1500.

Dakar, Senegal. Shore-based sampling of the Senegalese artisanal, recreational and industrial fisheries for size frequency, sex determination, and catch and effort data will be continued in 1993 by Mr. Taib Diouf, the East Atlantic Coordinator. Requested funding for 1993 will be $1500. The West Atlantic Coordinator may travel to Senegal to train samplers in taking data and to demonstrate tagging techniques for the recreational fishery.

Cote d'Ivoire. Abidjan shore-based sampling of the artisanal and recreational fisheries for billfish will be continued and directed by CRO staff in 1993. Standardized indices of abundance for blue marlin and sailfish will be developed for the time series 1984-1992 and a report will be submitted on these analyses. The West Atlantic Coordinator may travel to Côte d'Ivoire to review past data files, train samplers in sex determination, and give presentations on tagging techniques for the recreational fishery. Funding for 1993 will be $1500.

Ghana. Shore-based sampling of size frequency and sex determination, and catch and effort of the artisanal gillnet fisheries for billfish will be continued in 1993 by Mr. Martin Mensah. Standardized CPUE's

for sailfish will be developed for the time series, 1984-1992. Funding for 1993 will be $1500.

Canary Islands. Shore-based sampling of size frequency of off-loaded billfish carcasses from Taiwanese longline vessels will be continued in 1993. Requested funding for 1993 is $400.

c) At-sea sampling

Venezuela. At-sea sampling out of the port of Cumaná, Puerto de la Cruz, and Carúpano will be continued in 1993. A total of 15 tuna trips ($7,500), 10 swordfish trips ($4,000), and 4 long-range trips on large Korean-owned, Venezuelan-flagged vessels ($3,500) will be made in 1993. Insurance will be $1,072 and the total funding for 1993 will be $16,072.

Grenada and St. Vincent. A joint study to intensively tag and release west Atlantic sailfish will be conducted between CARICOM and ICCAT on Grenada and St.Vincent in 1993. New longline vessels obtained from Japan will be used on both islands to tag and release sailfish caught by longline. ICCAT funding for this portion of the study will be $1,000 for 1993 and this amount will be matched by CARICOM. This funding could provide for up to 20 trips during the year.

Brazil. At-sea sampling on Brazilian and Taiwanese longliners fishing out of Rio Grande do Sul, as well as other ports will be initiated in 1993. Dr. Alberto Amorim from the Instituto de Pesca and Mr. José Nelson Antero da Silva from IBAMA will direct these research activities. Requested funding for 1993 will be $1000.

Telemetry Studies. Develop telemetry studies to evaluate the survival of marlin caught and released off longline vessels. No cost for 1993, but proposals will be solicited.

d) Billfish tagging program

The inventory of tagging supplies is sufficient for the 1993 tagging season. In order to further encourage the return of tagged billfish, two types of tagging posters will be printed in Japanese, Chinese, and Portuguese and distributed to longline vessels from these countries. In addition, the florescent orange tag-recapture cards now distributed by the U.S. National Marine Fisheries Service will be printed in the three ICCAT languages and distributed to participants of the tagging program. Requested funding for printing the new posters and cards is $2500 for 1993 and $1500 are required for various rewards for 1993.

e) Age and growth

Requested funding for biological samples from juvenile and very large billfish, as well as tag-recaptured billfish, is $750 for 1993.

f) Coordination

f-1 Travel/Coordination

Experience in the west Atlantic (SCRS/90/20, SCRS/91/18, and SCRS/92/24) continues to indicate that it will be necessary to make a series of trips in specific Caribbean island locations to maintain quality control of on-going research. The purpose of this travel will be to train samplers in data collection, pick up data, assist in data analysis, hand-carry frozen biological samples back to Miami, monitor the rapidly changing pelagic fisheries, and maintain contacts with project cooperatives. In addition, travel will also be necessary from Miami, Florida, to west Africa and Brazil to assist the East Atlantic Coordinators in refining sampling programs, particularly tag release and recapture activities. Funding for 1993 will be $12,000. Travel may include the following areas:

- -- Cumaná, Margarita Island, and La Guaira, Venezuela
- -- Grenada
- -- St. Maarten, Netherlands Antilles
- -- Trinidad and Tobago
- -- Cancun and Cozumel, Mexico
- -- Dakar, Senegal
- -- Abidjan, Côte d'Ivoire
- -- Santos and Recife, Brazil
- -- St. Vincent
- -- Other west African and Caribbean countries

f-2 Miscellaneous/Mailing

The requested funding for 1993 for east Atlantic miscellaneous and mailing is $100. Similar needs for

the West Atlantic Coordinator are covered by the U.S. domestic budget.

f-3 Secretariat

Funding for mailing and shipment of materials, data management, and samples ($1000) and for miscellaneous expenses and contingencies ($1000) for 1993 are included. Requested funding for 1993 is $2000.

Because of unforseen changes in the fisheries and opportunities for sampling, it may be necessary for the General Coordinator to make adjustments in budgeted program priorities. These changes, if any, will be made in consultation with the ICCAT Secretariat and the area Coordinators. Also, the implementation of the proposed budget (Table 1) is contingent upon receipt of sufficient funds. The expansion or reduction of expenses will depend, to a large degree, on the amount of funds obtained for 1993.

Table 1. 1993 Budget of the Enhanced Billfish Research Program (US$)

Budget Chapters	*Budgeted Amounts*
SPECIES IDENTIFICATION KIT:	0.00
AGE AND GROWTH:	
Purchase of hard parts	500.00
TAGGING:	
Tag rewards	750.00
Lottery rewards	500.00
Hard part rewards	500.00
Printing posters and recapture cards in Japanese/Chinese/Portuguese	2,500.00
STATISTICS & SAMPLING	
-- *West Atlantic shore-based sampling:*	
Cumaná, Venezuela	320.00
Puerto La Cruz, Venezuela	160.00
Margarita Island, Venezuela	864.00
La Guaira, Venezuela	1,152.00
Caracas, Venezuela	1,200.00
Grenada	1,500.00
Jamaica	1,000.00
Trinidad & Tobago	2,000.00
St. Maarten, Netherlands Antilles	1,000.00
Mexico	1,000.00
-- *West Atlantic at-sea sampling:*	
Venezuela (Cumaná, Puerto La Cruz and Carúpano)	16,072.00
St. Vincent and Grenada	1,000.00
Telemetry studies	0.00
Brazil	1,000.00
-- *East Atlantic shore-based sampling:*	
Dakar, Senegal	1,500.00
Côte d'Ivoire	1,500.00
Ghana	1,500.00
Canary Islands	400.00
COORDINATION:	
Travel by Coordinators	12,000.00
Mailing & miscellaneous-East Atlantic	100.00
Secretariat support (data management, mailing, etc.)	2,000.00
GRAND TOTAL:	$52,018.00

Appendix 11 to Annex 14

REPORT OF PROGRESS MADE IN 1992 IN THE ALBACORE RESEARCH PROGRAM

The Albacore Research Program, initiated in 1990 by ICCAT, was designed to improve knowledge on the biology, ecology and population dynamics of albacore (*Thunnus alalunga*) of the Atlantic Ocean.

During the 1980's, the situation of the fisheries changed significantly. The appearance of new fishing gears (gillnets and pelagic trawls) and the decline of traditional fishing methods (troll and longline) were observed. During this period, the level of research was moderate, for varied reasons. Knowledge on the state of the stocks, particularly of the North Atlantic stock, became problematic.

The Albacore Research Program was created to coordinate the research efforts of the national scientists concerned with these fisheries, initiate some new activities, and in extreme cases, finance the field activities. The goals assigned were the following:

i) Obtain general information, by intensifying certain observations, on all the biological parameters of the species for the different areas of the Atlantic and the Mediterranean.

ii) Re-evaluate the state of the albacore resource, particularly the North Atlantic stock, by analyzing completely the available fishing statistics.

iii) Because of recent conflicts between some surface fisheries, initiate studies on the interactions between the fisheries, through observer cruises.

After three years of research efforts (1990-1992), the situation is the following:

i) Studies on the biological parameters have made marked progress. This has led to progress in the study of the growth of albacore, using different methods: study of hard parts, tagging and modal analysis. Documents SCRS/91/85, SCRS/92/48 and SCRS/92/-119 deal with the north Atlantic, and Document SCRS/92/108 deals with the south Atlantic. The results are not yet definitive and the studies are continuing, but consistency is noted in the different estimates.

The length-weight relationships, which were the subject of long discussions at the Albacore Workshop in 1989, were reviewed and numerous measurements were made in the northeast Atlantic in order to verify a set of homogeneous data (SCRS/92/47 and SCRS-/92/122).

The intensive tagging carried out in 1988-1991 in the northeast Atlantic by Spain (11,727 albacore were tagged) produced 227 recoveries, throughout the four years (SCRS/ 92/119). A complete analysis of these tag/recoveries is still to be made.

The systematic use of the Schnute and Fournier method (MULTIFAN program) applied to catch-at-size data of the north Atlantic for 1975-1991 permitted the calculation of a realistic catch-by-age matrix (SCRS/92/48). This responds to a criticism often made in the past on the use of the "slicing" method.

Standardized abundance indices by year-classes were calculated for the Spanish surface fisheries (troll and baitboat), for the period 1983-1991.

ii) In order to evaluate the state of the stocks, two assessment working group meetings were organized by ICCAT, in 1990 and in 1992. The latter, held in October 1992, produced conclusions reported in document SCRS/92/22. In particular, for the first time the "tuned VPA" method called ADAPT was used for albacore. Although still imperfect, the conclusions obtained on the state of the north Atlantic stock constitute important progress in comparison to the previous state of the lack of knowledge.

A similar assessment of the south Atlantic stock is possible, and is planned to be carried out in the near future.

An assessment of the Mediterranean stock remains impossible for the present time.

iii) The observer cruises from 1989 to 1992 were partly financed by the ICCAT Albacore Research Program, partly by the EC, and partly by the countries concerned. For reasons of confidentiality, the files are first analyzed at the national level. They will be synthesized at the end of the Albacore Research Program.

In conclusion, the Albacore Research Program has made clear progress in studying the biology of albacore. The possibility of diagnosing with precision the current and past state of the north stock is good. The detailed analysis of the state of the south stock is also possible. The Albacore Research Program does not anticipate holding an official meeting in 1993. A final meeting to synthesize all work of the Program is planned for mid-1994. It is suggested that this meeting be held in Spain.

Appendix 12 to Annex 14

SECRETARIAT REPORT ON THE COORDINATION OF THE ICCAT ENHANCED BILLFISH RESEARCH PROGRAM

The Program for Enhanced Research for Billfish, which began in 1987, continued in 1992. The Secretariat served as the coordinator for transferring funds and distributing tags, information, and data. The billfish data base is maintained at the NMFS Southeast Fisheries Center (Miami, Florida) and at the ICCAT Secretariat.

The General Coordinator of the Program is Dr. B. Brown, the East Atlantic Coordinators are Mr. T. Diouf (Senegal) and Mr. M. Mensah (Ghana), while the West Atlantic Coordinator is Dr. E. Prince.

Contributions to the Billfish Fund in 1992 were relatively slow and inconsistent, as has been the case in past years. This has resulted in delays in the disbursement of funds for some research activities. Overall, the Program Plan for 1992 was successfully carried out in a timely manner.

The Second ICCAT Billfish Workshop was held at the NMFS Southeast Fisheries Center (Miami, Florida, U.S.A.), at the invitation of the U.S. Government and was very well attended (42 scientists from 16 countries). It resulted in a large amount of information being obtained (27 working documents were submitted). Considerable work was accomplished, including the first assessments of Atlantic marlin made in over a decade (SCRS/92/129 and SCRS/92/128). The Report of the Billfish Workshop and the documents submitted will be published in the Collective Volume of Scientific Papers series.

The attached Table 1 shows the Billfish Budget and expenditures as of November 1, 1992. The attached Table 2 shows the income received at the Secretariat for the Billfish Program as of November 1, 1992, and the balance of the Program funds.

The overall research activities are summarized in the Report of the Billfish Workshop. Research carried out in the west Atlantic is described in SCRS/92/24 while that for the east Atlantic is described in SCRS/92/70 and SCRS/92/146, as provided by the Coordinators of the respective areas.

Table 1. Budget & Expenditures of the Enhanced Billfish Research Program (as of Nov. 1, 1992) (US$)

Budget Chapters	*Amount Budgeted*	*Total Expenditures*
SPECIES IDENTIFICATION KITS:	0.00	0.00
AGE AND GROWTH: Purchase of hard parts	500.00	0.00
TAGGING:		
Tag rewards	500.00	0.00
Lottery rewards	500.00	510.00
Hard part rewards	500.00	0.00
Printing posters in Japanese/Chinese	2,000.00	0.00
Purchase of tags	*	4,601.06
STATISTICS & SAMPLING ENHANCEMENT		
-- *West Atlantic shore-based sampling:*		
Cumaná, Venezuela	200.00	200.00
Puerto La Cruz, Venezuela	140.00	222.29
Margarita Island, Venezuela	500.00	544.56
La Guaira, Venezuela	1,500.00	1,500.00
Grenada	1,500.00	1,510.00
Barbados	1,000.00	0.00
Jamaica	1,000.00	0.00
Dominican Republic	500.00	0.00
Trinidad port-sampling	2,700.00	1,010.00
U.S. & British Virgin Islands	500.00	0.00
St. Maarten	1,000.00	0.00
Mexico	0.00	0.00
– *West Atlantic at-sea sampling:*		
Cumaná, Venezuela	4,800.00	4,800.00
Puerto La Cruz	8,600.00	8,600.00
Trinidad	500.00	0.00
St. Vincent	500.00	0.00
Grenada	500.00	0.00
U.S. & British Virgin Islands	0.00	0.00
Uruguay, Brazil, Argentina	0.00	0.00
-- *East Atlantic shore-based sampling:*		
Dakar, Senegal	4,200.00	2,720.00
Côte d'Ivoire	0.00	0.00
Ghana	0.00	0.00
Benin	500.00	0.00
Sao Tomé and Principe	0.00	0.00
South Africa	0.00	0.00
Other West African countries	0.00	0.00
Las Palmas, Canary Islands	0.00	422.71

Table 1. (Continued)

Budget Chapters	*Amount Budgeted*	*Total Expenditures*
HISTORICAL DATA RETRIEVAL:		
Brazil	1,000.00	1,010.00
COORDINATION:		
Purchase of freezer and shipment to FONAIAP in Cumaná, Venezuela	*	1,117.76
Travel by Coordinators	7,000.00	0.00
Travel/Meeting expenses for ICCAT Billfish Workshop	10,000.00	6,301.00
Mailing & miscellaneous--East Atlantic	100.00	0.00
Secretariat support (data management, mailing, etc.)	2,000.00	0.00
GRAND TOTAL	54,240.00	35,069.38

* These expenses were not included in the 1992 Budget, but were approved by the Coordinator.

Table 2. Funds received in 1992 for Billfish Program (up to November 1, 1992)

Source	*Amount (in $US)*
The Norcross Foundation *	15,000.00
Southeast Fisheries Center	10,000.00
South Florida Fishing Classic *	4,960.00
The Billfish Foundation	4,973.65
The Billfish Foundation	6,956.00
TOTAL	$41,889.65

* Funds donated through The Billfish Foundation.

ANNEX 15

CONFERENCE OF PLENIPOTENTIARIES OF THE CONTRACTING PARTIES TO THE INTERNATIONAL CONVENTION FOR THE CONSERVATION OF ATLANTIC TUNAS

Madrid, June 4-5, 1992

FINAL ACT

1. At its Twelfth Regular Meeting, held in Madrid on November 11-15, 1991, the International Commission for the Conservation of Atlantic Tunas (ICCAT) decided to hold a Conference of Plenipotentiaries of the Contracting Parties to the International Convention for the Conservation of Atlantic Tunas to amend paragraph 2 of Article X of said Convention.

2. The Conference of Plenipotentiaries was held in Madrid on June 4-5, 1992.

3. The Conference elected Dr. A. Ribeiro Lima (Portugal) as Chairman and Mr. L. G. Pambo (Gabon) as Vice-Chairman.

4. The Conference designated Dr. L. Koffi (Côte d'Ivoire) as rapporteur.

5. The Conference established a Credentials Committee, consisting of Canada, Gabon and Spain.

6. Of the twenty-two Contracting Parties to the International Convention for the Conservation of Atlantic Tunas, the following were present at the Conference: Angola, Brazil, Canada, Côte d'Ivoire, France, Gabon, Ghana, Republic of Guinea, Japan, Republic of Korea, Morocco, Portugal, Sao Tomé and Principe, South Africa, Spain, and United States.

7. The Food and Agriculture Organization of the United Nations (FAO), of which the Director-General is the depositary of the International Convention for the Conservation of Atlantic Tunas, was represented at the Conference.

8. The Conference used as a basis for its discussion the Proceedings of the Twelfth Regular Meeting of the Commission, held in Madrid, November 11-15, 1991, and the report of the Working Group to Study Alternative Schemes to Calculate the Member Country Contributions to the Commission Budget.

9. The Conference adopted the attached Protocol amending paragraph 2 of Article X of the International Convention for the Conservation of Atlantic Tunas. The Protocol was opened for signature on June 5, 1992.

10. The application of the provisions of paragraph 1 of Article XIII referring to the entry into force of amendments being technically impossible, the Conference decided to adopt a special procedure for the entry into force of the Protocol. This procedure takes into account the fact that the contributions of the developed market economy countries would increase while those of the developing countries would decrease.

11. Taking into account the financial difficulties the Commission is currently facing, and being conscious of

the necessity to adopt a new and realistic formula for calculating the contributions of the Contracting Parties, the Conference resolved that the Governments of the Contracting Parties to the International Convention for the Conservation of Atlantic Tunas should proceed as soon as possible to implement the internal procedures necessary for the approval, ratification or acceptance of the Protocol, so as to ensure its entry into force.

12. The Conference resolved that the Commission should, at its first meeting following the entry into effect of the amendment of paragraph 2 of Article X of the Convention, introduce in its Financial Regulations the method of calculation resulting from the application of the "Basic Principles of New Calculation Scheme", which was adopted at the Twelfth Regular Meeting of the Commission.

IN WITNESS THEREOF, the undersigned, duly authorized representatives of the States listed below, have signed this Final Act:

Done in Madrid on this Fifth of June, Nineteen Hundred and Ninety-Two, in a single copy, in the English, French and Spanish languages, each text being equally authentic, the original text shall be deposited in the archives of the Food and Agriculture Organization of the United Nations.

PROTOCOL
to Amend Paragraph 2 of Article X of the International Convention for the Conservation of Atlantic Tunas

The Contracting Parties to the International Convention for the Conservation of Atlantic Tunas, adopted in Rio de Janeiro on May 14, 1966,

Have agreed as follows:

ARTICLE 1

Paragraph 2 of Article X of the Convention shall be modified as follows:

"2. Each Contracting Party shall contribute annually to the budget of the Commission an amount calculated in accordance with a scheme provided for in the Financial Regulations, as adopted by the Commission. The Commission, in adopting this scheme, should consider *inter alia* each Contracting Party's fixed basic fees for Commission and Panel membership, the total round weight of catch and net weight of canned products of Atlantic tuna and tuna-like fishes and the degree of economic development of the Contracting Parties.

"The scheme of annual contributions in the Financial Regulations shall be established or modified only through the agreement of all the Contracting Parties present and voting. The Contracting Parties shall be informed of this ninety days in advance."

ARTICLE 2

The original of this Protocol, the English, French and Spanish texts of which are equally authentic, shall be deposited with the Director-General of the Food and Agriculture Organization of the United Nations. It shall be open for signature in Madrid on June 5, 1992 and thereafter in Rome. The Contracting Parties to the Convention that have not signed the Protocol may nevertheless deposit their instruments of acceptance at any time. The Director-General of the Food and Agriculture Organization of the United Nations shall send a certified copy of this Protocol to each of the Contracting Parties to the Convention.

ARTICLE 3

This Protocol shall enter into force for all the Contracting Parties the ninetieth day following the deposit with the Director-General of the Food and Agriculture Organization of the United Nations of the last instrument of approval, ratification or acceptance by three-quarters of the Contracting Parties, and these three-quarters shall include all of the Parties classified by the United Nations Conference on Trade and Development as of June 5, 1992, as developed market economy countries. Any Contracting Party not included in this category of countries can, within six months following the notification of the adoption of the Protocol by the Director-General of the Food and Agriculture Organization of the United Nations, request the suspension of the entry into force of said Protocol. The provisions set out in the last sentence of Paragraph 1 of Article XIII of the International Convention for the Conservation of Atlantic Tunas shall apply *mutatis mutandis*.

ARTICLE 4

The scheme of calculating the amount of the contribution of each Contracting Party provided by the Financial Regulations, shall be applied from the financial period following that in which this Protocol enters into force.

IN WITNESS WHEREOF, the undersigned, duly authorized representatives of the States listed below, have signed this Protocol.

CHAPTER III

NATIONAL REPORTS

NATIONAL REPORT OF BRAZIL*

by

J. H. Meneses de Lima
Instituto Brasileiro do Meio Ambiente
e Recursos Naturais Renováveis - IBAMA

1. Status of the fisheries

1.1 Fleet Development

The 1991 Brazilian baitboat fleet was comprised of 21 boats. Two boats are less than 50 GRT and the others are in the 51-200 GRT category. The Santos based-fleet increased from 11 to 13 boats while the fleet based in Rio Grande do Norte, northeastern region, was reduced from 10 to 4 boats.

There were 14 leased longline vessels, which is more than twice the annual average number of boats in operation in recent years. This increase in fleet size was due to the starting of operations of 11 Taiwanese vessels, based in the State of Rio Grande do Sul. Except for a Honduran flag vessel in the 51-200 GRT category, all the leased longliners are in the 201-500 GRT category. The annual number of longliners operating in Brazilian waters for the 1982-1992 period is shown in Table 1.

Data for 1992 show that the Brazilian longline fleet increased to 21 boats, while the Taiwanese fleet increased to 15 boats. This number is expected to increase further, since other Taiwanese flag vessels were licensed in 1991 to fish under leasing contracts, and some of these vessels have just been incorporated into the fleet.

The Brazilian baitboat fleet increased from 51 boats in 1990 to 53 boats in 1991. Although four newly built boats entered the fleet in 1991, the increase in fleet size was only by two vessels, since two boats which had operated in 1990 were withdrawn. The foreign leased baitboat fleet was comprised of four boats, which is the same number in operation since 1983. For the Brazilian fleet, the majority of the boats are in the 51-150 GRT. All the Japanese-leased baitboats are in the over 151 GRT category. The annual number of baitboats operating in Brazilian waters for the 1982-1992 period is shown in Table 2.

An important improvement in the Brazilian baitboat fleet was the entering into operation of a baitboat measuring 38 meters in length (over 151 GRT), which was built in 1989, and is equipped with a brine freezing system. Fishing efficiency of this boat has been comparable to that of the large foreign-leased baitboats.

1.2 Fishing areas

The Brazilian longline fleet based at Santos continued to operate in its traditional fishing area between 20-30°S and 30-50°W. The longline fleet based in the northeast region operated in the area be-

* Original report in English.

tween 00-20°S. As for the leased Taiwanese longline fleet, the fishing area covers the entire Brazilian coast.

Although the baitboat fishing area extends from 20-34°S, each fleet concentrates its fishing effort in different areas: the leased fleet fish mainly between 25-34°S; the Brazilian baitboats based in Rio de Janeiro operate mainly between 22-25°S; and the Brazilian baitboats from Santa Catarina concentrate the major part of their fishing effort between 25-30°S.

1.3 Catches

The catches of tuna and tuna-like species taken by longliners in Brazilian waters, during the 1979 through 1991 period, are shown in Table 3. In 1991 catches of Santos-based longliners were not included, because these data were not available. For the leased longline fleet, catches in 1991 (2,474 MT) were the highest recorded since 1986 when the maximum of 2,284 MT were caught. The main species caught was albacore (1,015 MT), followed by swordfish (666 MT).

Up to 1990, the dominant species in the catches were bigeye and swordfish. In 1991, since the leased fleet was comprised mainly of Taiwanese vessels which target albacore, the species composition of catches has changed, and showed, for the first time, a predominance of albacore in the catches.

Preliminary estimates for 1992 indicate a catch of 3,724 MT and 380 MT, for the Taiwanese and the Japanese leased fleets, respectively.

Table 4 shows catches by Brazilian and Japanese leased baitboats for the 1979-1991 period. The total catch amounted to 22,072 MT, of which 73 percent was taken by Brazilian baitboats. As usual, skipjack continued to be the dominant species caught, followed by yellowfin. Other species caught, which include albacore, blackfin tuna and small tunas, represent only 2.2 percent of the catches. Although the same species are caught by all fleets, the species composition is different. Catches by Brazilian baitboats from Rio de Janeiro show a much higher percentage of yellowfin in the catches than the other fleets.

2. Research

The main institutions participating in research programs on tuna are the "Instituto Brasileiro do Meio Ambiente e Recursos Naturais Renováveis" (IBAMA), the "Instituto de Pesca" (IP), the "Fundaçao Universidade do Rio Grande" (FURG) and the Rural Federal University of the State of Pernambuco (UFRPe). Regional units of IBAMA that participate in research works are CEPENE and CEPSUL, located in the northeast and south regions, respectively. IBAMA is also responsible for Brazilian fishery statistics, except for the State of Sao Paulo, where fishery statistics are collected by the "Instituto de Pesca".

The collection of size frequency data of the main species caught by baitboats continued in 1991. In Rio de Janeiro, where sampling was discontinued in 1990, the work is being resumed. In 1991, there were still some problems which resulted in a low level of sampling (only 379 skipjack were measured for length). In Santa Catarina, sampling activities were intensified, and a total of 8,523 skipjack and 705 yellowfin were measured for length. Size frequency samples for skipjack caught by leased baitboats were smaller than in 1990, since catches from some fishing trips were landed in the State of Rio Grande do Sul in the second half of 1991. Since activities of the leased baitboats started, sporadic landings have been made in Rio Grande do Sul, but in 1991, landings increased. Some sampling activities are planned to start at this port next year.

Yellowfin sampling for length and weight was started in 1992 to study seasonality in the length and weight relationship. Some measurements for predorsal length and fork length are also being taken.

Sampling for size frequency was also done from yellowfin caught by Brazilian longliners, in the northeast of Brazil, and from some yellowfin and swordfish catches landed in Santa Catarina State by a medium size Honduran leased longline vessel.

As concerns catch and effort data, since 1989, there have been some problems with data collection in Rio de Janeiro, which resulted in a low recovery rate of logbook records in 1991. The necessary measures are being taken to improve data collection.

All the size data and the catch and effort data collected by IBAMA are sent regularly to the ICCAT Secretariat.

3. Special meetings

The Data Preparatory Meeting on Tunas and Tuna-like Fishes in the Southwestern Atlantic was held at Rural Federal University of the State of Pernambuco from July 1 to 7, 1992, at the invitation of IBAMA. The meeting was agreed upon by the

Standing Committee on Research and Statistics (SCRS), at its meeting in November, 1991, for the purpose of improving statistics for the southwest Atlantic tuna and tuna-like species. The Contracting Parties which attended the meeting were: Brazil, Japan, United States and Venezuela. The ICCAT Secretariat was represented by the Assistant Executive Secretary, Dr. P. M. Miyake. The meeting was chaired by Mr. J. A. Negreiros Aragao of Brazil.

IBAMA was responsible for the arrangements in preparation and local coordination of the meeting and also sponsored the participation of all Brazilian scientists responsible for the collection of statistics and sampling data from the different areas of Brazil.

Brazilian scientists submitted seven working documents for consideration by the group and three papers already published were presented as reference documents.

The group reviewed the fisheries of the southwestern area and examined all the historical data series of the Brazilian tuna fisheries, available at ICCAT data base, and as a result, a considerable number of discrepancies in the data from different sources were eliminated. During the meeting, it was found that some Brazilian institutions have many biological and morphometric data that have not been analyzed yet and a recommendation was made to carry out analysis on these data before the November ICCAT meetings. It was also found that some Brazilian data were missing from the ICCAT data base. Many of these data were sent to the ICCAT Secretariat afterwards. Since Brazilian scientists from all the areas of major tuna fisheries were present at the meeting, a significant improvement was made in Brazilian statistics. The reported catches of sharks by tuna longliners are summarized in Table 5.

4. Shark fisheries

Sharks are caught as "by catch" in many artisanal fisheries carried out in the north and northeast regions of Brazil. As landings by these fleets occur in a great number of landing places, it is very difficult to get reliable statistics from these fisheries. Due to the fact that sharks are not the target species in the fishery, sometimes catches are not reported by the fishermen. In cases when catches are reported, there is no species breakdown.

As regards species composition of sharks caught by these fisheries, some inferences can be made on the possible composition based on fishing experiments carried out for sharks, using bottom longline, in the northeastern region of Brazil, during the 1970's. These experiments showed that the sharks known as "sucuri da galha preta" *(Carcarhinus spp)* and "jaguaras" *(Galeocerdo cuvier)* made up most of the catches.

During the last years, there has been an increase of shark catches in the tuna fisheries, representing about 40 percent of the total catches in weight. The increasing interest in sharks in the tuna fisheries is due to the high prices obtained for shark fins. As a result, sharks are now one of the target species fished by Brazilian longliners.

Information on species composition of sharks caught by Brazilian longliners has been reported by Hazin et al (1990). From the analysis of logbooks from tuna fishing trips carried out by three longliners operating in the northeast region of Brazil, during the 1983 through 1988 period, it was concluded that the blue shark *(Prionace glauca)* represented almost 38 percent of the total catch in weight. This species, together with the *Carcharhinus* sharks, are the dominant species, representing almost 95 percent of the shark catches.

In the south and southeast regions of Brazil, sharks are incidentally caught by double rig shrimp trawlers, bottom pair trawlers and stern trawlers. The most important shark species caught by these fisheries are the "cação anjo" *(Squatina argentina, S. guggenhein* and *S. oculta)*. Other important species in the catches are *Galeorhinus galeus, Mustelus canis* and *M. schmitti*. Data on species composition of sharks landed in Rio Grande do Sul and Santa Catarina, for 1990 and 1991, respectively, showed that sharks represent about 20 percent of the total catches. In recent years, some directed fisheries for sharks using pelagic and bottom gillnets and bottom longlines have been developed, mainly in the south region of Brazil. In these fisheries sharks may account for up to 90 percent of the total catches. Shark landings in the States of Sao Paulo, Santa Catarina and Rio Grande do Sul, during the 1986-1991 period, are shown in Table 6.

5. References

Hazin, F.H.V., Couto, A.A., Kihara, K., Otsuka, K. and Ishino, M. 1990. Distribution and abundance of pelagic sharks in the southwestern equatorial Atlantic. J. Tokyo Univ. Fish., 77(1):51-64.

Table 1. Distribution of longliners by vessel flag and port base, 1982-1992

Fleet	*Port Base*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*	*1988*	*1989*	*1990*	*1991*	*1992*
Brazilian	Sao Paulo	7	9	9	6	6	6	-	9	11	13	17
	Rio G. do Sul	1	2	2	2	2	2	-	-	-	-	-
	Rio G. do Norte	-	1	1	2	3	3	3	8	10	4	4
Sub-Total		8	12	12	10	11	11	3	17	21	17	21
Japanese*	Rio G. do Sul	6	4	3	3	6	5	5	5	5	2	1
Chinese*	Rio G. do Sul	-	-	-	-	-	-	-	-	-	11	15
Honduran*	Santa Catarina	-	-	-	-	-	-	-	-	1	1	-
Sub-Total		6	4	3	3	6	5	5	5	6	14	16
Grand Total		14	16	15	13	17	16	8	22	27	31	37

*Foreign vessels leased by Brazil.

Table 2. Distribution of baiboats by vessel flag and port base, 1982-1992

Fleet	*Port Base*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*	*1988*	*1989*	*1990*	*1991*	*1992*
Brazilian	Rio de Janeiro	-	-	-	-	-	-	-	19	15	22	-
	Santa Catarina	-	-	-	-	-	-	-	12	10	22	-
	Both ports	-	-	-	-	-	-	-	16	26	9	-
Sub-Total		97	57	47	50	42	43	46	47	51	53	-
Japanese*	Santa Catarina	5	4	6	5	6	5	5	5	7	4	4
Grand Total		102	61	53	55	48	48	51	52	58	57	4

*Foreign vessels leased by Brazil.

Table 3. Catches (MT) of tunas and tuna-like fishes taken by the Brazilian and foreign-based longline fleets 1979-1991

Species	*Fleet*	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*	*1988*	*1989*	*1990*	*1991***
Yellowfin tuna	Brazilian	695	238	432	353	382	351	240*	381	243	388	409	481	125
	Leased	381	283	727	582	505	132	276	676	409	476	634	122	334
	Total	1076	521	1159	935	887	483	516	1057	652	864	1043	603	459
Albacore	Brazilian	164	186	69	191	205	189	71	68	63	69	69	121	1
	Leased	217	204	187	537	472	280	226	436	262	328	372	356	1015
	Total	381	390	256	728	677	469	297	504	325	397	441	477	1016
Bigeye tuna	Brazilian	242	195	114	228	136	133	46	73	65	60	35	48	3
	Leased	405	393	341	464	378	522	364	789	691	885	471	534	308
	Total	647	588	455	692	514	655	410	862	756	945	506	582	311
Swordfish	Brazilian	320	1169	431	627	498	346	342	457	444	655	556	777	12
	Leased	200	409	223	391	283	122	227	304	511	470	241	679	666
	Total	520	1578	654	1018	781	468	569	761	955	1125	797	1456	678
Billfishes	Brazilian	83	105	80	83	108	142	196	347	201	226	285	276	13
	Leased	142	47	10	78	47	28	63	69	61	85	61	73	144
	Total	225	152	90	161	155	170	259	416	262	311	346	349	157
Others	Brazilian	4	2	1	1	0	1	1	5	7	4	9	12	38
	Leased	10	2	3	3	2	6	4	10	3	3	7	10	7
	Total	14	4	4	4	2	7	5	15	10	7	16	22	45
TOTAL	Brazilian	1508	1895	1127	1483	1329	1162	896	1331	1023	1402	1363	1715	192
	Leased	1355	1338	1491	2055	1687	1090	1160	2284	1937	2247	1786	1774	2474
	Total	2863	3233	2618	3538	3016	2252	2056	3615	2960	3649	3149	3489	2666

* Includes minor quantities of albacore and bigeye.

** Does not include data for the Brazilian longline fleet based in Santos. Fishermen's estimates were used in 1989 and 1990 for the Santos-based longline fleet since landing weight is not available.

Table 4. Catches (MT) of tunas and tuna-like fishes taken by the Brazilian and Japanese-leased baitboat fleets, 1979-1991

Species	*Fleet*	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*	*1988*	*1989*	*1990*	*1991*
Skipjack tuna	Brazilian	1818	6070	13786	16299	11688	7379	14038	14322	9359	9963	14218	13290	14477
	Leased	-	-	76	1714	3660	5708	11014	8220	6794	7264	6331	6735	5947
	Total	1818	6070	13862	18013	15348	13087	25052	22542	16153	17227	20549	20025	20424
Yellowfin tuna	Brazilian	117	392	906	1027	1737	1169	1890	624	1379	1446	1331	862	1109
	Leased	-	-	-	4	40	129	286	127	180	149	45	92	60
	Total	117	392	906	1031	1777	1298	2176	751	1559	1595	1376	954	1169
Others*	Brazilian	169	384	47	143	325	589	463	446	642	342	184	268	480
	Leased	-	-	-	42	14	41	57	19	8	3	2	15	-
	Total	169	384	47	185	339	630	520	465	650	345	186	283	480
TOTAL	Brazilian	2104	6846	14739	17469	13750	9137	16391	15392	11380	11751	15733	14420	16065
	Leased	0	0	76	1760	3714	5878	11357	8366	6982	7416	6378	6842	6007
	Total	2104	6846	14815	19229	17464	15015	27748	23758	18362	19167	22111	21262	22072

* Includes albacore, bigeye and small tunas; data for the period 1979-1983 may include dolphins (Coriphaena hippurus) and other species.

Table 5. Catches, in dressed weight, of pelagic sharks by the Brazilian and foreign leased longline fleets and their percentage composition in relation to total catches, 1977-1991.

	National						*Leased **		
	Sao Paulo		*Rio Grande do Sul*		*Northeast*		*Rio Grande do Sul*		
Year	*Sharks*	*%*	*Sharks*	*%*	*Sharks*	*%*	*Sharks*	*%*	*Total*
1977	234.8	16.4					92.7	18.6	327.5
1978	323.6	21.3					226.7	12.6	550.3
1979	405.5	20.8					228.7	14.4	634.2
1980	450.1	18.9					329.1	19.7	779.2
1981	606.4	34.4					410.8	21.6	1017.2
1982	521.8	26.9	22.3	18.3			761.4	27.0	1305.5
1983	680.0	37.2	207.0	48.2	5.5	29.3	674.6	28.6	1567.2
1984	796.2	43.5	169.4	53.6	38.4	31.7	222.2	16.9	1218.2
1985	653.4	47.3	125.9	59.5	57.0	32.1	328.4	22.1	1164.7
1986	650.4	38.2	169.5	55.6	120.2	30.7	386.8	14.5	1326.9
1987	603.5	42.2	115.5	52.3	187.1	53.2	485.1	20.0	1391.2
1988	665.4	34.6			160.7	40.7	484.2	17.7	1310.3
1989	888.7	44.3			153.1	32.9	216.2	10.8	1258.0
1990	1317.4	50.3			151.0	24.0	391.4	18.1	1559.8
1991					111.8	35.6	206.8	20.4	511.7**

* Only Japanese flag vessels leased by Brazil.

** Included 193.1 MT of sharks caught by Chinese leased vessels which started fishing for tunas in 1991.

Table 6. Landings (MT) of sharks in selected states of the southeast and south regions of Brazil, 1986-1991

Years	*States*	*Cacao Anjo*	*Other Sharks*	*Total*
1986	Santa Catarina	933.1	1966.4	2899.5
	Sao Paulo	64.1	1336.8	1401.6
	Rio Grande do Sul	1369.0	2534.0	3903.0
	Sub-Total	*2366.9*	*5837.2*	*8204.1*
1987	Santa Catarina	965.7	1192.4	2158.1
	Sao Paulo	202.7	1836.8	2039.5
	Rio Grande do Sul	1474.0	2549.0	4023.0
	Sub-Total	*2642.4*	*5578.2*	*8220.6*
1988	Santa Catarina	726.2	1046.8	1773.0
	Sao Paulo	---	---	---
	Rio Grande do Sul	2071.0	2451.0	4522.0
	Sub-Total	*2797.2*	*3497.8*	*6295.0*
1989	Santa Catarina	83.4	655.5	738.9
	Sao Paulo	---	---	---
	Rio Grande do Sul	707.0	1169.0	1876.0
	Sub-Total	*798.4*	*1824.5*	*2614.9*
1990	Santa Catarina	8.7	434.7	443.4
	Sao Paulo	---	---	---
	Rio Grande do Sul	310.0	738.0	1048.0
	Sub-Total	*318.7*	*1172.7*	*1491.4*
1991	Santa Catarina	220.6	960.9	1181.5
	Sao Paulo	---	---	---
	Rio Grande do Sul	---	---	---
	Sub-Total	*220.6*	*960.9*	*1181.5*

NATIONAL REPORT OF CANADA*

by

J. M. Porter**

1. Introduction

The Canadian Department of Fisheries and Oceans has responsibility for Canadian fisheries management and statistics and for research on Atlantic large pelagic species fished in Canadian waters in support of the ICCAT Convention. In February, 1992, the research responsibility for bluefin tuna was transferred from the Gulf Fisheries Centre in Moncton, New Brunswick, to the Biological Station in St. Andrews, New Brunswick, so that the entire Canadian large pelagic fisheries research program now resides in St. Andrews.

2. Status of the fisheries

2.1 Bluefin tuna

The Canadian nominal landings of Atlantic bluefin tuna in 1991 were 481.7 MT (round weight) (Table 1), leaving 16 percent of the Canadian quota uncaught. The major fisheries took place off southwest Nova Scotia (Hell Hole between Browns and Georges banks), approximately 302 MT (63 percent of the Canadian catch), and Newfoundland (tail of Grand Banks and Virgin Rocks), 105 MT. In the Gulf of St. Lawrence 43 MT of bluefin tuna were caught, and about 14 MT were harvested off northeastern Nova Scotia. No bluefin tuna were caught as by-catch in the St. Margaret's Bay mackerel trap fishery. The Canadian offshore longline vessel, which directs its effort towards non-regulated tuna species within Canada's 200-mile zone, caught 13.3 of its 35 MT bluefin by-catch limit (Table 2).

2.2 Swordfish

The Canadian nominal landings of swordfish in 1991 were 1026 MT (round weight), taken mainly by longline (93 percent), with smaller landings by the harpoon fishery (Table 3). The mean weight (round) by longlined and harpooned swordfish caught in the Canadian fishery was 61 kg and 78 kg, respectively (Table 3).

Only 11 percent of the Canadian landings by number in 1991 constituted small fish as defined by the ICCAT swordfish recommendations for regulatory measures (< 25 kg round, Table 3). It should be noted that the average weight of longlined swordfish and the percentage of small fish are the same in 1990 and 1991 (Table 3).

2.3 Sharks and unregulated tunas

Historically, blue shark, porbeagle and shortfin mako have been a by-catch of the swordfish longline fishery. Recently, several boats have been directing effort on mackerel sharks, including 303 MT landed by a single vessel in 1991. The 1991 reported landings of 519 MT are summarized by species in Table 1. The catch of sharks in Canadian waters is believed to be higher than is currently reported because of discarding and no previous requirement to identify as to species. These problems are being addressed through regulations planned for 1993.

Albacore, bigeye and yellowfin tuna (unregulated species) were directed for by one Canadian offshore longline vessel (Table 2). There are also incidental catches in the swordfish longline fishery. The landings

* Original report in English.

** Pelagic Fisheries Section, Biological Station, Department of Fisheries & Oceans, St. Andrews, New Brunswick, E0G 2X0 Canada.

reported in 1991 were: albacore 6 MT; bigeye 27 MT; and yellowfin 28 MT (Table 1).

3. Research studies

3.1 Bluefin tuna

Sampling of the inshore bluefin fishery consisted of numbers and dressed weights of all fish harvested. There was also sampling carried out on the Canadian offshore and Japanese longline fisheries within the Canadian 200-mile fisheries zone by the Canadian Observer Program.

No analyses of 1991 log records have been conducted due to departmental reorganization mid-year. These data will be available for the bluefin assessment conducted in 1993.

The multiple mark-recapture tagging study was continued in the Hell Hole fishery. Eight of 62 fish tagged in 1990 were recaptured by the end of 1991, and a further 71 tags were applied in 1991. The purpose of this study is to estimate the size of the Hell Hole school of fish and to study their movements. Preliminary results indicate: (1) fish remain vigorous after tagging; (2) there is considerable movement through the area during a particular season; and (3) fish returned to the same seasonal feeding areas for a second year.

A 2-year histological study of gonad anatomy and maturity was begun as a cooperative study between the Department of Fisheries and Oceans and Acadia University, Wolfville, Nova Scotia. This study was designed to provide a scientific basis upon which to calculate the proportion of the bluefin population at age contributing to the spawning stock biomass. At present, the age of maturity used for the west Atlantic stock is 8 years (200 cm). Fish were sampled from the U.S. and Canadian fisheries.

3.2 Swordfish

At-sea sampling was undertaken on domestic and offshore commercial harpoon and longline boats (July-October) and on the Japanese longline vessels while in the Canadian 200-mile fisheries zone, and involved collection of hardparts for ageing and growth studies, fecundity data, morphometrics and stomach contents.

A Department of Fisheries and Oceans swordfish longlining cruise (P91-420) was undertaken to collect the above data, as well as data on bait robbing, attraction to artificial lures and by-catch. Collaborative studies on population structure in swordfish and structural movement of large pelagic fish was conducted with the Royal Ontario Museum. Results of the genetic studies suggest considerable mixing of swordfish.

A cooperative study was conducted with the U.S. on a stock biomass production model.

3.3 Sharks and unregulated tunas

Biological sampling was carried out on the Canadian offshore and Japanese longline fisheries within the Canadian 200-mile fisheries zone. There has been no sampling of the remainder of the domestic fleet.

4. Management

4.1 Bluefin tuna

In 1991, 247 licensed fishermen participated in the Atlantic-wide directed bluefin tuna fishery (Table 4). The 12 temporary licences issued to Newfoundland fishermen in 1988-90 were converted to regular licences in 1991. In addition, 26 temporary licences were issued to Newfoundland fishermen (Table 4). These 38 licences were subject to a reduced level of fishing activity and restricted to NAFO Divisions 3LNO. One offshore licence was issued for non-regulated tunas with a by-catch of 35 MT of bluefin. A further 20 mackerel trap licences in St. Margaret's Bay were re-issued, allowing a by-catch of bluefin (Table 4).

The bluefin tuna fishery on the Atlantic coast was subject to the following measures in 1991:

1) Quota: A quota of 573 MT was allocated among seven inshore management units and the offshore fishery (including trip limits);

2) Consultation: Fishing seasons and quotas for each management area were made in consultation with industry and strictly monitored by the DFO;

3) Limited Entry: The number of regular directed bluefin tuna licences was limited to 731, plus 26 temporary licences, 20 mackerel trap licences in St.

Margaret's Bay (by-catch of bluefin), and one offshore licence (bycatch of 35 MT of bluefin);

4) Restrictions: Strict vessel replacement, management fishing areas and licence transfer requirements were enforced;

5) Gear: Gear restrictions were as follows: commercial fishery limited to rod and reel and/or tended line (must be attached to vessel; maximum of two lines, each with one hook fished at one time); charter limited to rod and reel; pelagic longline in offshore fishery. Electric harpoons were permitted in the Scotia-Fundy Region on a one-year experimental basis;

6) Tags: A strict tagging program was conducted: each bluefin caught was tagged with a uniquely numbered identification tag. This was used in conjunction with logbooks for the purpose of catch monitoring.

4.2 Swordfish

Fifty-two licenced swordfish longline fishermen (directed fishery) were active in the 1991 fishery on the edge of the Scotian Shelf and the Grand Banks of Newfoundland. Participation has remained relatively unchanged since 1988 (Table 3). Harpoon licences were issued to 891 fishermen (some also have longline licences) though only about 61 were active (Table 3). In addition, one offshore licence was issued for non-regulated tunas with a swordfish by-catch provision of 60 MT (Table 4).

The 1991 Atlantic Swordfish Fishing Plan contained the following management measures which were revised in 1991:

1) Quota: A quota of 2000 MT was assigned for 1991 and broken down as follows:

Total Quota	2000
By-catch for Canadian offshore tuna vessels	120
Canadian longline and harpoon quota	1880

2) By-catch: (i) Longline vessels directing for swordfish were permitted to retain as by-catch, tuna other than bluefin; (ii) a 60 MT (maximum) swordfish by-catch quota was established for each (two) offshore Canadian tuna licences (only one active).

3) Area: A condition of licence appeared on all swordfish licences: "Valid for NAFO Convention Subareas 3, 4 and 5 only, excluding Fishing Zones 1 and 2 of Canada" (Gulf of St. Lawrence and Bay of Fundy).

4) Limited Entry: Swordfish longline licences and swordfish harpoon licences were available only to fishermen who held such licences in 1988, 1989 or 1990.

5) Drift Nets: The ban on Canadian vessels using high seas drift nets for fishing large pelagic species was continued.

6) Small Fish: A prohibition on the taking and landing of swordfish less than 25 kg (live weight) was established. A length equivalent for this measure was 125 cm from the fork of the tail to the tip of the lower jaw. Vessels were limited to 15 percent tolerance of the number of fish per landing.

7) Opening Date: The opening data for swordfishing was May 1 for the 1991 season.

4.3 Sharks and unregulated tunas

In 1991, there were no regulations for sharks or tunas other than bluefin.

5. Preliminary information for 1992

5.1 Bluefin tuna

In response to new ICCAT regulatory recommendations, Canada has implemented a two-year (1992-93) Atlantic bluefin tuna fishery management plan. Major *changes* to the 1991 plan are as follows:

1) Quota: A quota of 573 MT for 1992, and 458 MT for 1993 was assigned with the provision that any uncaught 1992 quota will be made available for the 1993 fishery. The combined total for both years will be an overall reduction of 10 percent as per the ICCAT measures. This quota provides for fishing allocations for the seven inshore management units and the offshore longline fishery;

2) Gear: Experimental use of the electric harpoon was extended on an Atlantic-wide basis for one year.

Other elements of the 1991 management plan remain unchanged for 1992-93 (Section 4.1).

The nominal Canadian landings as of 1 October 1992 were 351 MT from the inshore fishery. To date, no bluefin landings have been made by the offshore longline fishery although an allocation of 35 MT is still available.

No bluefin have been caught in the St. Margaret's Bay mackerel trap fishery in 1992. Some incidental fish were caught in herring weirs and released around Grand Manan Island, New Brunswick (Bay of Fundy). Large fish were also harvested in the Gulf of St. Lawrence and off the coast of Cape Breton, Nova Scotia.

Reported sightings of small to medium tuna were frequent during 1990-92. This may imply some improvement in the western bluefin stock as a result of the restrictive management measures in place since 1982.

The scientific research program at the Biological Station, St. Andrews was as follows:

1) This was the final year of a two-year histological study of gonad anatomy and maturity (cooperative between the DFO and Acadia University).

2) This was the final year of three-year mark-recapture study. In 1992, 23 fish were tagged, for a total of 156 tuna tagged. To date, there have been 13 recaptures, with preliminary recapture rates of 16 percent in 1990, 4 percent in 1991 and 0 percent in 1992.

3) A bluefin tuna stomach content analyses study was initiated in the Hell Hole. Fifty-five stomachs were collected during the commercial fishery for later analyses. The purpose is to determine the diet of fish in the Hell Hole concentration.

4) Bluefin tuna gonads and vertebra, and morphometrics were sampled from the commercial domestic fleet (21 samples) and Japanese longline fleet within the Canadian 200-mile fisheries zone in support of Bluefin Year Program biological sampling.

5.2 Swordfish

In 1992, 61 longline licences and 72 harpoon licences were active. Records to date (1 October 1992) indicate that the fishery has landed more than 498 MT and is still in progress.

The scientific research program at the Biological Station, St. Andrews was as follows:

1) A cooperative study with the Pacific Biological Station (DFO) was undertaken to examine the analytical methods used to estimate age composition of the catch for stock assessment.

2) Port sampling for lengths and weights was conducted to reduce variance due to dressed weight to LJFL conversions in the catch-at-age calculations.

3) Historical swordfish log records were coded and analysed for use in the CPUE index for the stock biomass production model used for stock assessment (cooperative with Japan, Spain and USA).

5.3 Sharks and unregulated tunas

Regulatory amendments and a shark fishery management program are planned for 1993. The proposed Management Plan will include gear restrictions, a finning prohibition, and a comprehensive fishing and biological data collection and reporting system for porbeagle, shortfin, mako and blue sharks. Scientific advice has been reviewed and provided by the Canadian Atlantic Fisheries Scientific Advisory Committee (July 1992).

Table 1. Summary of Canadian landings (MT round weight) of large pelagic fish species 1991

Species	*1991 landings*	
Swordfish	1026.5	
Bluefin tuna	481.7	
Albacore tuna*	5.7	
Bigeye tuna*	27.1	62.8
Yellowfin tuna*	28.0	
Unspecified tuna*	2.0	
Blue shark*	31.0	
Mackerel sharks (mako and porbeagle)*	427.0	519.4
Unspecified sharks*	61.4	

* Not final.

Table 2. Catches (MT round weight) of the Canadian offshore large pelagic fishery, 1987-91

	1987	*1988*	*1989*	*1990*	*1991*
BFT*	33	104	53	28	13
BET	144	95	31	15	0
ALB	21	47	22	21	+
YFT	40	30	7	14	+
SWO*	15	16	6	9	0

* Species regulated by Canadian quota regulations.
+ <1 MT.

Table 3. Summary of 1988-91 active licences, swordfish landings (MT round weight), average weight of fish (kg round weight) and percentage small fish*

	1988	*1989*	*1990*	*1991*
Number of active licences				
Longline	39	52	50	53
Harpoon	+	+	+	61
Catch (MT)				
Longline	887	1097	819	963
Harpoon	24	146	92	73
Total	911	1243	911	1026
Average weight (kg)				
Longline	50	52	61	61
(# sampled)	(1315)	(3902)	(10280)	(8111)
Harpoon	--	129	138	78
(# sampled)	(0)	(637)	(164)	(146)
% of catch small fish* (by number)	9	16	11	
% of catch sampled	7	23	71	49

* <25 kg round weight.
\+ Undetermined number, but <100.

Table 4. Distribution of bluefin tuna and swordfish fishing licences by region and species* in 1991

	Number of licenses			
	Bluefin		*Swordfish longline*	
Region	*Total*	*Active*	*Total*	*Active*
Gulf	616	115	4	0
Newfoundland	55**	51	4	0
Scotia-Fundy	32	32	68	52
St. Margaret's Bay***	20	20	--	--
Quebec	54	28	0	0
Offshore****	2	1	2	1
Total	779	247	78	53

* Only bluefin tuna and swordfish are regulated.
** 12 temporary licences issued in 1988-90 converted to regular licences in 1991, 26 temporary licences issued in 1991; these 38 licenses are subject to a reduced level of fishing activity and restricted to NAFO Divisions 3LNO.
*** Mackerel trap licences with by-catch of bluefin tuna.
**** Offshore fishing licences for non-regulated tunas with by-catch of 35 MT of bluefin and 60 MT of swordfish.

NATIONAL REPORT OF COTE D'IVOIRE*

by

Amon Kothias and F. X. Bard

1. The Fishery

There are currently no national tuna vessels in operation.

Abidjan continues to be a very important port for international tuna vessels. Landings and transshipments were maintained at about 150,000 MT/year in 1991. A decline is expected in 1992, due to economic reasons. The low price of tuna has led to a decline in purse seine fishing effort.

The "Centre de Recherches Océanographiques" (CRO) continues to carry out the work of the statistical coverage of all the purse seiners (about 100) based at Abidjan. The CRO collects, on its own initiative with the help of some flag states, the following data at the rate of one fish per every 2 MT landed/transshipped:

- -- Landings
- -- Catch and effort by the fishing books
- -- Multi-species sampling

2. Research

Biological research is carried out routinely on:

- -- Yellowfin gonads at the cannery
- -- Tag recoveries

In 1991, the recovery of two transatlantic tags was noted, one of a yellowfin tuna and the other a blue marlin. These two fish were tagged by the sport fisheries in the northwest Atlantic.

Occasionally, research is carried out on the feeding of tunas, through an examination of stomach contents.

As regards research related to ICCAT, the CRO initiated at the end of 1984 (SCRS/88/54) a study on the artisanal canoe fishery that fishes with gillnets off Abidjan. In 1987, in order to contribute to the Billfish Program, the CRO carried out systematic statistical coverage, including an individual count and measurements of all the large fish landed (marlins, sailfish, swordfish, sharks). This coverage is continuing at present. The results are presented in Documents SCRS/92/147 and SCRS/92/148.

* Original report in French.

NATIONAL REPORT OF FRANCE*

1. Status of the Fishery

1.1 General overview

French catches of tunas rose to 81,500 MT in 1991, maintaining the record catch for the decade, and were obtained mainly due to the high catches of tropical tunas. The breakdown of these catches is shown in the attached Table 1.

1.2 Bluefin tuna

In the Mediterranean, during the 1991 fishing season, 24 purse seiners operated, taking 4,570 MT of bluefin tuna. The catches in the Atlantic Ocean for the same year were very low (565 MT). These catches corresponded to the baitboats, and 448 MT were taken by other gears targeting albacore (drift nets and pelagic trawls), that caught 47 and 70 MT, respectively.

1.3 Albacore

In the Atlantic, albacore fishing was carried out during the summer of 1991 by 47 gillnet vessels and 23 paired pelagic trawlers, which landed 3,660 and 460 MT of albacore, respectively. These vessels only carry out troll fishing sporadically. In the Mediterranean, the 24 purse seiners incidentally caught 110 MT in 1991.

1.4 Tropical tunas

Catches of tropical tunas in 1991 by French tuna vessels reached a high level of 72,200 MT, of which 34,200 MT were yellowfin and 31,400 MT were skipjack, with increased purse seine fishing effort (3 more purse seiners) and decreased baitboat effort (from 17 to 9 vessels). The yellowfin catches have returned to an average level, after the record level that was observed in 1990.

2. Research

France participated in the GFCM/ICCAT Joint Consultation in Crete, which discussed large pelagic fish in the Mediterranean.

2.1 Bluefin tuna

Sampling of the landings of bluefin tuna from purse seiners operating in the Mediterranean continued. In 1991, this sampling was carried out based on commercial data and covered almost 95 percent of the total catch and 85 percent of the size composition. Two programs were carried out, sponsored by the EC, in which various member countries of the Mediterranean area participated. One of these studies involved tagging operations on various species of large pelagic fish, among them, bluefin tuna; the other study concerned the improvement of knowledge on the statistics and biology of the species.

2.2 Albacore

Research on north Atlantic albacore was carried out within the framework of the ICCAT Albacore Research Program. Studies centered on the development of ageing methods for large albacore, with a view towards improving analytical stock assessments. Important assistance was also obtained from the EC. In 1991, experiments on the depth of drift nets were carried out, in order to decrease the incidental catches of marine mammals. In 1992, taking into account the regulations of the EC Council concerning the utilization of drift nets, a program of observers was initiated on-board vessels equipped with this gear. This program will be continued until 1993.

In the Mediterranean, during two cruises, partially financed by the EC, around the Balearic Islands (June 1991) and off the Gulf of Lyon (September 1991), a study on Mediterranean albacore that began five years

* Original report in French.

ago, was continued. More than 900 fish were tagged and released. This has brought to more than 3,000 the number of fish tagged by France in the Mediterranean. Up to now, about 40 of these fish have been recovered by professional fishermen, but no transatlantic migration has yet been indicated. The program on large pelagic fish in the Mediterranean, financed in part by the EC, intends to improve the statistics and knowledge on the factors causing concentrations of this species in the Mediterranean, based on data already obtained.

2.3 Tropical tunas

As concerns the tropical tunas, fishery statistics are collected and research is carried out in close collaboration with research centers in Côte d'Ivoire, Senegal and Venezuela, where some French scientists are working.

Detailed fishery statistics for the French inter-tropical fleets were submitted on a timely basis to ICCAT. Research on tropical tunas was centered on the following:

-- Analysis of the changes in fishing power of the inter-tropical purse seine fishery;

-- Methodology to estimate catch at age based on catch at size;

-- Evaluation of the state of the yellowfin stock;

-- Analysis of tuna catches obtained by purse seiners in association with floating objects.

These research projects were the subject of several documents submitted to the SCRS in 1992 by French scientists.

Table 1. Catches (in 1,000 MT) of tunas in 1981-1991

	1981	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*	*1988*	*1989*	*1990*	*1991*
YFT	40.6	29.2	31.9	5.8	9.8	16.6	16.6	21.6	30.6	43.8	34.2
SKJ	27.2	26.1	20.5	13.2	8.5	11.7	15.1	16.3	15.6	16.4	31.4
BET	0.4	3.0	6.0	2.1	4.4	4.6	3.4	3.8	2.8	4.9	6.6
ALB	3.3	3.6	3.0	2,9	2,2	1.2	2.0	2.8	3.7	3.4	4.2
BFT	2.4	5.0	4.1	4.2	5.6	3.8	4.9	6.2	4.9	5.2	5.1
TOTAL	73.9	66.9	65.5	28.2	30.5	37.9	42.0	50.7	57.6	73.7	81.5

NATIONAL REPORT OF JAPAN*

by

National Research Institute of Far Seas Fisheries

1. Fishing activities

The major Japanese tuna fishery in the Atlantic is the longline fishery, with minor catches taken by purse seine. The 1991 Japanese catch of Atlantic tunas and billfishes is estimated to amount to 48,627 metric tons (MT), 92 percent of which was taken by the longline fishery (Table 1). The purse seine catch in 1991 was 4,452 MT. In 1991, no substantial change in fishing pattern of either fishery has been reported.

1.1 The longline fishery

The number of Japanese longliners operating widely in the Atlantic in 1991 was 242, slightly more than in 1990 (Table 2). The longline catch in 1991 is estimated to be 44,175 MT, which represents about a 20 percent decrease from the 1990 catch (Table 3). Although the 1991 catch of bigeye tuna decreased to 29,127 MT (66 percent of the total), the predominance of this species in the total longline catch has remained unchanged for more than a decade. Other species in the longline catch included important catches of swordfish and yellowfin, followed by bluefin. The swordfish catch decreased from 7,305 MT in 1990 to 4,408 MT in 1991. In recent years since 1990, there appears to be active longline fishing in winter in the higher latitudes of the central north Atlantic (30°W-50°W) for bigeye and bluefin tunas where longlining was not so common previously.

1.2 The purse seine fishery

Two Japanese purse seiners operated in the Gulf of Guinea in 1991 (Table 2). The operational pattern of this fishery has been stabilized for recent years. The catch in 1991 was 4,452 MT, which was almost exclusively comprised of skipjack and yellowfin tuna (Table 4).

2. ICCAT regulations

Since the initiation of the fishery regulations established by the International Commission for the Conservation of Atlantic Tunas (ICCAT) for swordfish, bluefin, yellowfin, and bigeye tunas, Japanese fishermen have been concurrently under national regulatory measures. To comply with the bluefin tuna regulations, an area closure has been in effect in the Mediterranean Sea from May 21 to June 30, since 1975, and in the Gulf of Mexico throughout the year, since 1982. These closures have been effective in reducing fishing mortality on the spawning stock. In recent years, the entry of longliners in the northwestern Atlantic and Mediterranean Sea has been limited to certain numbers. In addition, bluefin and swordfish catches in the north Atlantic have been monitored closely by reporting through cable. To patrol the longline fleet, two governmental boats were dispatched to the Atlantic Ocean, one to the Mediterranean Sea during the closure periods, and the other to the northwestern Atlantic. The tropical purse seine fleet has also been under national regulation in accordance with the ICCAT 3.2 kg size limits on yellowfin and bigeye tunas.

3. Research activities

The National Research Institute of Far Seas Fisheries (NRIFSF) is in charge of the collection and

* Original report in English.

compilation of Atlantic fishery data necessary to conduct scientific research on Atlantic tunas and billfish stocks. All the statistical data are routinely reported to the ICCAT Secretariat, and the results of scientific research are also presented at the regular meetings and inter-sessional workshops of the Standing Committee on Research and Statistics (SCRS).

3.1 Fishery data

Then NRIFSF reported final 1990 catch, catch/-effort and size frequency data (Task I, II and biological sampling) of the longline fishery to the ICCAT Secretariat. The compilation of the same data for 1991 is in progress. The preliminary 1991 catch estimates are given in this report. The size data for swordfish and bluefin tuna in 1991 were prepared and presented to the 1992 SCRS Meeting. The quick reporting system of logbooks and size data by on-board sampling at the port of call has been continued since its inception in April, 1984. Task I and II data from the purse seine fishery for 1991 were finalized and reported to the ICCAT.

3.2 Tuna biology and stock assessment

The biological and stock assessment studies carried out by the NRIFSF on Atlantic tunas and billfishes have been continued. New research activities were initiated in 1992, i.e., the Bluefin Year Program (BYP) and a shark study. As for BYP-related studies, Japanese research will cover the various aspects of the biology and stock assessment of Atlantic bluefin tuna, including stock identification by the mtDNA method, reproductive biology, especially the spawning potential of medium-sized fish in the western Atlantic, and ageing. A review paper on the statistics and biology of sharks taken by Japanese longline vessels in the Atlantic was presented to the SCRS in 1992.

This year the NRIFSF scientists participated in various ICCAT and ICCAT-related meetings, i.e., the Data Preparatory Meeting for the Southwestern Atlantic, the Second Billfish Workshop, the Second GFCM/ICCAT Joint Consultation, the Swordfish Stock Assessment Session and the Albacore Stock Assessment Session.

4. Papers prepared for the 1992 SCRS

Documents presented to the SCRS in 1992 are included in Appendix 3 to Annex 14 and/or are published in the Collective Volume of Scientific Papers series.

Table 1. Japanese catches (MT) of tunas and tuna-like fishes by type of fisheries, in the Atlantic Ocean and Mediterranean Sea, 1986-1991

Type of fishery	*1986*	*1987*	*1988*	*1989*	*1990*	*1991**
Total	39,046	34,471	53,213	62,967	59,291	48,627
Longline (Home-based)	33,241	29,300	47,326	58,514	54,930	44,175
Purse seine	5,805	5,171	5,887	4,453	4,361	4,452

*Preliminary.

Table 2. Annual number of Japanese tuna boats that operated in the Atlantic Ocean and Mediterranean Sea, 1986-1991

Type of fishery	*1986*	*1987*	*1988*	*1989*	*1990*	*1991*
Longline (Home-based)	190	146	183	239	235	242
Purse seine	2	2	2	1	1	2

Table 3. Catches (MT) of tunas and tuna-like fishes taken by the Japanese longline fishery, 1986-1991

	1986	*1987*	*1988*	*1989*	*1990*	*1991**
Atlantic						
Albacore	1,209	851	1,128	1,214	1,324	1,341
Bigeye tuna	22,800	18,575	31,664	39,419	35,024	29,127
Bluefin tuna	1,323	1,860	2,278	2,396	2,014	2,169
Southern Bluefin	389	1,120	548	625	1,202	1,144
Yellowfin tuna	3,404	3,364	5,982	6,971	5,919	4,333
Swordfish	2,653	2,294	4,051	5,592	7,305	4,408
Blue marlin**	508	438	823	1,555	1,216	919
White marlin	129	134	144	146	126	127
Sailfish***	99	43	79	78	88	101
Others	378	341	366	390	538	422
Atlantic Sub-total	32,892	29,020	47,064	58,386	54,756	44,091
Mediterranean						
Bluefin tuna	341	280	258	127	172	83
Swordfish	7	3	4	1	2	1
Bigeye tuna	1	--	--	--	--	--
Mediterranean Sub-total	349	283	262	128	174	84
TOTAL	33,241	29,300	47,326	58,514	54,930	44,175

* Preliminary.
** Includes a minor amount (less than 30 MT) of black marlin.
*** Includes shortbill spearfish.

Table 4. Catches (MT) of tunas taken by the Japanese Atlantic purse seine fishery, 1986-1991

	1986	*1987*	*1988*	*1989*	1990	1991
TOTAL	5,805	5,171	5,887	4,453	4,361	4,452
Bigeye tuna	1	--	14	38	13	32
Yellowfin tuna	3,152	3,010	2,221	1,873	1,671	884
Skipjack tuna	2,652	2,161	3,652	2,542	2,677	3,536
Albacore	--	--	--	--	--	--

NATIONAL REPORT OF KOREA*

by

National Fisheries Research and Development Agency

1. Fishing activities

The number of Korean tuna longliners operating in the Atlantic Ocean has continuously decreased since 1977 and was comprised of 9 longliners in 1991 (Table 1).

The total Korean commercial catch of tunas and tuna-like fishes amounted to 1,876 MT in 1991, which showed a decrease of 57 percent compared to the 1990 catch (4,268 MT).

The composition of the catches, by major species, is as follows:

Bigeye 801 MT (43 percent of the total catch)

Yellowfin 260 MT (14 percent of the total catch)

There have been no significant changes in the fishing pattern and the fishing grounds for the Korean tuna longliners in recent years. Bigeye tuna is one of the major species caught, since Korean deep longline was introduced in 1980 in the Atlantic Ocean (see Table 1).

2. Research activities

As in the past, the National Fisheries Research and Development Agency (NFRDA) collected catch and effort data as well as size data on tunas and related species from the commercial fishing vessels. Catch, catch/effort (Task I and II) and size frequency data for 1991 were sent regularly to the ICCAT Secretariat.

* Original report in English.

Table 1. **Nominal catches (MT), by species, of tunas and tuna-like fishes taken by the Korean Atlantic longline fishery, 1977-1991**

Year	*Number of Boats*	*BFT*	*YFT*	*ALB*	*BET*	*SKJ*	*SWO*	*BUM*	*WHM*	*SAI*	*Other bill-fishes*	*Others*	*TOTAL*
1977	120	3	16,347	9,345	7,610	9	1,240	164	202	141	449	3,339	38,849
1978	47	-	11,512	4,418	9,182	42	1,333	177	79	29	111	2,211	29,094
1979	65	2	6,997	3,875	7,305	2	606	95	13	20	96	1,058	20,069
1980	54	-	5,869	1,487	8,963	4	683	9	1	5	167	1,764	18,952
1981	56	-	6,650	1,620	11,682	47	447	81	13	11	171	1,584	22,306
1982	52	-	5,872	1,889	10,615	21	684	17	24	16	114	1,781	21,033
1983	53	3	3,405	1,077	9,383	530	462	65	20	4	51	1,224	16,224
1984	51	-	2,673	1,315	8,943	29	406	61	5	3	423	927	14,785
1985	45	77	3,239	901	10,691	20	344	54	1	105	729	1,293	17,454
1986	28	-	1,818	694	6,084	11	82	15	-	62	106	1,093	9,965
1987	29	-	1,457	401	4,438	6	75	17	-	-	183	1,048	7,625
1988	29	-	1,368	197	4,919	3	123	-	-	-	409	782	7,801
1989	33	-	2,535	107	7,896	6	162	-	-	-	857	944	12,507
1990	17	-	808	53	2,690	-	101	-	-	-	446	170	4,268
1991	9	-	260	32	801	-	150	-	-	-	624	9	1,876

NATIONAL REPORT OF MOROCCO*

by

A. Srour
Institut Scientifique des Pêches Maritimes

1. Description of the fishery

1.1 Fishing methods

Fishing for tunas and tuna-like species is currently carried out in Morocco by artisanal longline vessels that operate close to their base ports. These boats mostly use the so-called "bonitard" drift net (55 mm mesh). The purse seiners also take small tunas as by-catch of the fishery for small pelagic species (sardine, anchovy, etc.)

Since 1990, there has been an increase in trap fishing, which takes place north Atlantic and in the Mediterranean Sea. In 1991, six traps operated off the Moroccan coasts, one in the Mediterranean and five in the Atlantic Ocean.

1.2 Species caught

Seven tuna species are caught by Morocco, of which the main species are: bluefin tuna, swordfish, frigate tuna, and Atlantic bonito.

1.3 Catches (Table 1)

The catches of tunas and tuna-like species represent only a small percentage as compared to those of the other more important fisheries, such as the sardine and cephapod fisheries.

However, there has been an overall improvement in the catches of tunas between 1986 and 1991 (+ 120 percent). This increase is mostly due to the increase in the catches taken by the traps.

In 1991, the total catch of tunas taken off the Moroccan coasts was on the order of 4,250 MT, of which 70 percent correspond to the coastal fleet and 30 percent to the traps. These catches dropped by about 20 percent as compared to those of 1989.

-- Atlantic

In 1991, the coastal fleet caught 1,876 MT, which was 22 percent less than in 1989. Atlantic bonito and frigate tuna made up 60 percent of these catches.

Trap catches in 1991 were on the order of 1,117 MT, which represents an increase of 102% with respect to 1990.

-- Mediterranean

Between 1989 and 1991, there was a 37 percent decrease in the catches of the coastal fleet and an 85 percent decline in the trap catches.

The catches by the coastal fleet in 1991 were 1,118 MT, of which 96 percent were frigate tuna and swordfish. In the "Principe" trap, 140 MT of tunas were caught, comprised of 84 percent frigate tuna and 16 percent bluefin tuna.

2. Research

The "Institut Scientifique des Pêches Maritimes" (ISTPM) of Casablanca routinely collects fishery statistics on tunas from the various landing sites.

In addition to an on-going program to measure the size and weight of frigate tuna and Atlantic bonito at the port of Mohammedia, another program was started this year to collect size and weight data on swordfish and fishing effort of the longliners that operate at the port of Nador. In recent years, the ISTPM has also been collecting size and weight data of bluefin tuna caught in some traps.

* Original report in French.

Table 1. Catch series for tunas and tuna-like fishes caught along the coasts of Morocco in 1986-91

		1986		1987		1988		1989		1990		1991	
		Trap	Coastal fleet	Trap	Coastal fleet	Trap	Coastal fleet	Trap	Coastal fleet	Trap	Coastal fleet	Trap	Coastal fleet
ATLANTIC													
Bluefin tuna	BFT	166	122	101	255	235	202	304	147	228	75	759	36
Atlantic bonito	BON	5	246	18	223	2	587	3	563	8	356	1	575
Frigate tuna	FRI	10	292	11	303	3	191	113	486	238	497	347	516
Swordfish	SWO	3	178	5	192	1	195	3	219	26	177	10	182
Black skipjack	LTA	0	47	5	103	1	48	3	11	53	202	0	41
Skipjack tuna	SKJ	0	425	0	105	0	428	0	295	0	837	0	178
Plain bonito	BOP	0	33	0	487	0	1422	0	1058	0	263	0	348
Total Atlantic		184	1343	140	1668	242	3073	426	2779	553	2407	1117	1876
MEDITERRANEAN													
Bluefin tuna	BFT	38	18	110	6	96	44	286	9	580	7	22	7
Atlantic bonito	BON	4	47	5	122	1	107	0	28	0	27	0	27
Frigate tuna	FRI	25	150	27	151	0	811	70	1107	185	1421	118	597
Swordfish	SWO	0	92	0	40	0	62	0	97	0	289	0	478
Black skipjack	LTA	0	0	0	0	0	12	0	0	0	4	0	0
Skipjack tuna	SKJ	0	2	0	13	0	0	0	0	0	0	0	0
Plain bonito	BOP	0	1	0	26	0	8	0	7	0	21	0	9
Total Medi.		67	310	142	358	97	1044	356	1248	765	1769	140	1118
ATLANTIC + MEDITERRANEAN													
Bluefin tuna	BFT	204	140	211	261	331	246	590	156	808	82	781	43
Atlantic bonito	BON	9	293	23	345	3	694	3	591	8	383	1	602
Frigate tuna	FRI	35	442	38	454	3	1002	183	1593	423	1918	465	1113
Swordfish	SWO	3	270	5	232	1	257	3	316	26	466	10	660
Black skipjack	LTA	0	47	5	103	1	60	3	11	53	206	0	41
Skipjack tuna	SKJ	0	427	0	118	0	428	0	295	0	837	0	178
Plain bonito	BOP	0	34	0	513	0	1430	0	1065	0	284	0	357
TOTAL		251	1653	282	2026	339	4117	782	4027	1318	4176	1257	2994

NATIONAL REPORT OF PORTUGAL*

by

Joao Pereira
Universidade dos Açores
Departamento de Oceanografía e Pescas

1. The tuna fishery

The Portuguese tuna fishery takes place mainly in the Azores and in Madeira, where the local baitboat fleet seasonally catches tunas with live bait. Off continental Portugal, the tuna catches are mainly taken as incidental catches by various gears, such as purse seine and drift nets. There is also a longline fishery directed at swordfish.

The surface longline fisheries, directed mainly at swordfish, operate off continental Portugal and in the Azores. Some of the longliners based in Portugal fish in the Azores area.

The catches of tunas and tuna-like fishes amounted to 13,345 MT in 1990 and 15,736 MT in 1991. Since 1989, a strong decrease in the Azorian catches and an important increase in Madeiran catches have been observed.

Tables 1 and 2 summarize the catches of tunas and tuna-like species taken in the Azores and in Madeira during the last few years. The catches by species and by gear, taken in the EEZ of continental Portugal, are given in Table 3.

The preliminary estimates of catches made during the first three quarters of 1992 indicate a catch of 6,109 Mt in Madeira and 4,751 MT in the Azores.

2. The tuna fleet

The Portuguese tuna fleet is comprised of baitboats in the Azores and Madeira, 20-25 longliners based in continental Portugal, and a dozen longliners in the Azores.

The number of baitboats, classified by gross registered tonnage (GRT), which comprise the fleets of the Azores and Madeira is given in Tables 4 and 5.

The baitboat fleet of the Azores, now has now greater autonomy and refrigeration capacity, which has permitted an extension of the duration of the cruises and the fishing zones. Since 1984, several new baitboats have entered the Azorian fishery: 3 in 1986, 6 in 1987, 7 in 1988, 4 in 1989, 5 in 1990, and 3 in 1991.

In Madeira, 3 new baitboats entered the fishery in 1991 and 6 in 1992.

3. Research

Research programs on tunas are mainly carried out by the Department of Oceanography and Fisheries of the University of the Azores, the Fisheries Research Laboratory of Fishery Research in Madeira, and the National Institute of Fisheries Research (INIP) in continental Portugal.

The collection of tuna statistics and sampling for size frequency of the principal species has continued. Since 1989, the number of tunas sampled in the Azores has increased considerably, due to more extensive coverage of the sampling points. The data are transmitted to ICCAT regularly and the scientific results are also presented to the SCRS meetings.

For several years now, radiometric maps of surface temperatures obtained by satellite have been distributed regularly to the baitboats of the Azores and Madeira.

* Original report in French.

Table 1. Catches of tunas and tuna-like species (MT) made in the Azores, 1986-1991

Species	*1986*	*1987*	*1988*	*1989*	*1990*	*1991*
Bigeye tuna	5,453	3,877	764	2,758	3,447	3,014
Skipjack tuna	5,032	7,932	13,751	5,921	2,252	2,497
Albacore	436	401	142	127	3,135	692
Yellowfin tuna	35	--	--	1	--	--
Bluefin tuna	151	58	--	--	--	--
Swordfish	30	335	213	185	214	471
Atlantic bonito	39	58	23	31	53	52
TOTAL	11,276	12,661	14,893	8,942	9,102	6,726

Table 2. Catches of tunas and tuna-like species (MT) made in Madeira, 1986-1991

Species	*1986*	*1987*	*1988*	*1989*	*1990*	*1991*
Bigeye tuna	1,698	593	1,395	2,189	2,455	2,475
Skipjack tuna	329	79	357	1,752	1,666	5,475
Albacore	13	29	29	39	47	10
Yellowfin tuna	10	44	93	3	42	81
Bluefin tuna	1	3	29	3	12	5
Swordfish	7	10	5	7	10	17
Others	34	2	2	3	10	4
TOTAL	2,092	760	1,910	3,996	4,243	8,067

Table 3. Catches of tunas and tuna-like species (MT), by gear and by species, in the EEZ of continental Portugal in 1991

Species	*LL*	*PS*	*SURF*	*TOTAL*
Bigeye tuna		1	69	70
Skipjack tuna		1	71	72
Albacore		1	6	7
Yellowfin tuna			210	210
Bluefin tuna			18	18
Atlantic bonito		181	64	245
Atlantic black skipjack		1	60	61
Frigate tuna		1	1	2
Swordfish	257	1		258
TOTAL	257	187	499	943

Table 4. Distribution of the baitboat fleet of Azores, by gross registered tonnage (GRT), 1984-1991

GRT	*1984*	*1985*	*1986*	*1987*	*1988*	*1989*	*1990*	*1991*
< 50	11	11	12	14	8	5	5	2
50-100	18	19	19	19	18	15	13	12
100-150	1	1	4	7	11	11	12	15
> 150				3	4	8	9	10
TOTAL	30	31	35	43	41	39	39	39

Table 5. Distribution of the baitboat fleet of Madeira, by gross registered tonnage (GRT), 1984-1991

GRT	*1984*	*1985*	*1986*	*1987*	*1988*	*1989*	*1990*	*1991*
< 50	17	21	26	19	22	20	22	27
50-100	5	5	6	7	10	10	7	6
100-150						1	6	4
> 150						4	2	3
TOTAL	22	26	32	26	32	35	37	40

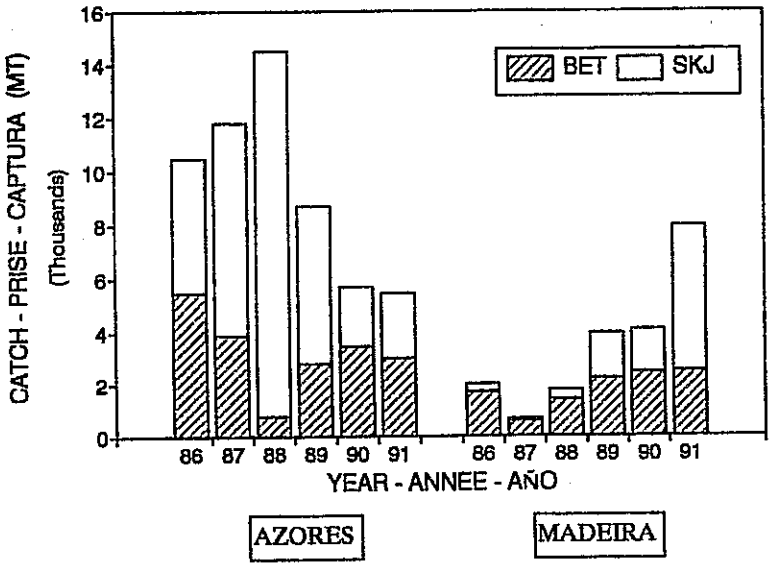


Fig. 1. Bigeye catches taken by Portuguese baitboats in the Azores and in Madeira, 1986-1991.

NATIONAL REPORT OF RUSSIA*

by

V. Z. Gaikov, M.E. Grudtsev, K. Ya. Batalyants, F. F. Litvinov
Atlantic Scientific Research Institute of
Marine Fisheries & Oceanography (AtlantNIRO)

1. The Fishery

In 1991, the total catch of tunas and tuna-like species amounted 9,189 MT, including 3,200 MT of yellowfin tuna, 2,171 MT of bullet tuna, 1,175 MT of skipjack tuna, 1,078 MT of frigate tuna, 948 MT of Atlantic bonito, and 617 MT of Atlantic black skipjack.

The purse seine fleet caught 5,423 MT, including 3,200 MT of yellowfin tuna, 1,175 MT of skipjack tuna, 617 MT of Atlantic black skipjack, and 431 MT of frigate tuna. The distribution of the catch by fishing areas, was as follows:

- Sierra Leone area: 3,328 MT (62% skipjack, 18% Atlantic black skipjack, 11% frigate tuna, and 9% skipjack tuna);
- Sao Tomé & Principe area: 1,470 MT (51% yellowfin tuna, 46% skipjack tuna, and 3% frigate tuna);
- Open area of the central east Atlantic: 625 MT (62% yellowfin, 32% skipjack tuna, 3% Atlantic black skipjack, and 3% frigate tuna)

The mid-water catches taken off northwestern Africa amounted to 2,145 MT of tuna, 647 MT of frigate tuna and 577 MT of Atlantic bonito. Catches in the southeastern Atlantic area were 371 MT of Atlantic bonito; those from the area off Argentina were 26 MT of bullet tuna. Data for 1991 on the tuna fishery are presented in Table 1; preliminary data on catches in the first half of 1992 are shown in Table 2.

2. Scientific research

Biological data on small tuna species (Atlantic black skipjack, frigate tuna, and bullet tuna), obtained from the purse seine and trawl catches during research cruises in the western Sahara, Sierra Leone, Gulf of Guinea and Point Noire areas from 1979 to 1990, were processed. The size composition of purse seine catches of three tuna species varied between the Sierra Leone, Gulf of Guinea and Point Noire fishing areas. The largest individuals of the three tuna species were caught in the Sierra Leone area. The size composition of Atlantic black skipjack catches taken by trawl off the southern Sahara area is very similar to that of the purse seine catches in the three above-mentioned fishing areas. Bullet tuna and frigate tuna taken by trawl in the area off western Sahara are slightly smaller than those taken in the purse seine fishing areas. Adult fish are caught mainly by purse seine nets and mid-water trawls.

Research was carried out on the biology of bullet tuna and its distribution in waters off the western Sahara. The most dense aggregations of this species are found on the continental shelf and slope during the latter half of the year, due to favorable hydrometeorological conditions. These aggregations, which are fished by mid-water trawls, are mainly due to feeding patterns. The major food elements are euphausiidae, small squid and fish. The age and growth of bullet tuna were studied, based on first dorsal fin ray spine sections, which provided information to analyze the age composition of the catch in the

* Original report in English.

area. The major component of the catches was comprised of mature fish (3-4 years old).

Studies were carried out on the problem of the relation of the state of yellowfin gonads and the availability of this species to the purse seine and longline fisheries. Macro- and microscopic research revealed the similarity in the state of the ovaries and oocytes in females that are caught with various fishing gears. The most convincing fact is that actually the entire range of the pre-ovulatory state, excluding ovulation and egg laying, is observed in the mixed layer of the deepwater and shallow thermocline. Thus, the relation of the availability of yellowfin tuna in the gonad state to various fisheries is excluded, whereas the availability depending on the depth of the thermocline is confirmed.

Pre-ovulatory changes in adult bigeye tuna, including ovulation, occurred at the depth of permanent habitation, i.e., within the thermocline layer. Migration into the epipelagic layer is incidental.

3. Shark research

Since 1977, AtlantNIRO has carried out research on large pelagic sharks associated with the tuna fishery.

Data are collected and processed on the size-weight relation, age, fecundity, intra-species structure, horizontal and vertical distribution, and some of elements of ocean and neretic species behavior off western Africa, in the Caribbean area at submerged rocks, and in the open Atlantic Ocean. Research has revealed that about 11 abundant species of large, predator, pelagic sharks that require similar environmental conditions and food species as tunas, occurred in the east Atlantic and were fished together with tunas. Those species may be sub-divided into two taxocenes, ocean and neretic, which differed in species composition and in the quantitative domination of individual species. Ocean taxocene consists of 3-5 species, with the absolute domination of the blue shark (*Prionace glauca*). In the temperate, sub-tropical, tropical and equatorial zones, the blue shark constitutes, over 90 percent of all pelagic sharks on the high seas, in biomass. But in the upper 30-100 m layers this species may be absent or occurs rarely. The blue shark remains in the layer with a 12-18°C temperature range. During the 1979-88 longline tuna fishing season, the shark by-catch amounted to 20-30 percent of the total catch, according to fishery statistics, but this index was actually much higher. According to reports from observers on-board fishing vessels and research boats, the proportion of sharks in the longline catches amounted to 50 percent, particularly in the bigeye tuna fishery, when the hooks are set deep, the proportion of blue sharks increases. Tuna catches amount to 400-3000 MT/year, of which 250-1500 MT are comprised of shark by-catch, or 5000-30000 individuals at an average weight of 50 kg per fish. *Isurus oxyrinchus, I. Paucus,* and *Carcharhinus londimanus* were dressed, frozen and sent to Europe, for export. The total volume of exports of sharks (dressed without head or fins) is less than 200 MT per year. The blue shark constituted over 90 percent of the by-catch (often up to 100 percent), but only part of the catch of this species was taken aboard due to the lack of space on vessels and since fishermen often cut off the line with hooks as sharks approach the vessel. The mortality rate is unknown, but some sharks survive and hooks are found in the mouths, throats, gullets, and even in the pericardial wall of sharks. Blue sharks taken aboard were reduced to fish meal. Scientists at AtlantNIRO revealed at least two stock units of blue sharks in the east Atlantic, a north stock, spawned on the continental shelf at 28-35°N, and a south stock, spawned on the shelf at 15-25°S. Adult sharks seldom enter the shelf area, particularly in the equatorial zone, due to inadequate temperatures. The blue shark of the east Atlantic is characterized by two distinct tooth forms: awl-shaped and knife-shaped. This characteristic is affected by sex dimorphism (awl-shaped teeth are more common in males, whereas knife-shaped teeth are more common in females, which is related to the female hold at mating). In general, however, knife-shaped teeth are typical for the north stock, while awl-shaped teeth are more typical for the south stock.

Neretic taxocene of the east Atlantic consists of 5-7 species of abundant predator epipelagic sharks. The pattern of dominance in the area differs as compared to that in the ocean. The dominant species of silk shark (*Carcharhinus falciformis*) has never exceeded 50 percent of the total longline catch of sharks, and other shark species also show close values of relative abundance. The silk shark forms schools, consisting of several tens of individuals, that are often caught by the purse seine fishery.

The shark by-catch may reach 2-4 percent to 12 percent of the total catch. According to current data, the purse seine fishery does not significantly affect the silk shark stocks in the east Atlantic. Nevertheless,

statistical data should be collected from all vessels that operated in the area. Due to the peculiarities of the purse seine net operation, sharks that are discarded usually die.

4. References

Grudtsev, M.C., and Gaikov, V. Z. 1991. State of yellowfin skipjack stocks in the east Atlantic/ Problems of fishery prediction. Thesis of report, Allunion scientific conference, Kaliningrad, June 5-7, 1991, p.14-16.

Ovchinnikov, V.V., Gaikov, V.Z., and Grudtsev, M. E., 1991. Tuna resources as an object of national fishery in the Atlantic Ocean/State of commercial biological resources in the central and south Atlantic and east Pacific. Coll. of sci. trans. of AtlantNIRO, Kaliningrad, p. 102-131.

Table 1. Catches of tuna species and tuna fishing effort in the Atlantic Ocean in 1991, by areas, periods and fishing gears

Area	*Gear*	*No. of vessels*	*Period*	*Fishing effort in days at sea*	*Catches (MT)* *YFT*	*SKJ*	*LTA*	*FRI*	*BLT*	*TOTAL*
Sierra Leone	PS	6	Feb.-April	285	2,063	300	600	365	--	3,328
Sao Tomé & Principe	PS	5	May-Sept.	284	751	675	--	44	--	1,470
Open central-tropical Atl.	PS	6	Feb.-Oct.	233	386	200	17	22	--	625
Western Sahara	Trawl							207	1,845	2,052
Senegal	Trawl							440	300	740
Argentina	Trawl								26	26
TOTAL					3,200	1,175	617	1,078	2,171	8,241

Table 2. Russian catches (MT) of tunas and Atlantic bonito in the first half of 1992

Yellowfin tuna	1,115
Skipjack tuna	630
Atlantic black skipjack	230
Frigate tuna	420
Bullet tuna	176
Atlantic bonito	16
Total	2,587

NATIONAL REPORT OF SOUTH AFRICA*

by

A. J. Penney

1. The tuna fishery

Catch and effort in the South African surface baitboat fishery decreased sharply during 1991. This decrease resulted almost entirely from restrictions on access to the important Tripp Seamount albacore fishing area following the declaration of Namibian independence. It is difficult to estimate the decrease in effort as the tuna vessels alternate between fishing for tuna, squid and other line-caught fish species. The reported catch decreased by 41 percent to only 2,849 MT, the lowest catch reported since 1984. Most of this decrease resulted from the reduced catch of albacore off the South African west coast, although this species still provided 95 percent of the catch. By-catches of yellowfin and bigeye tunas declined to very low levels.

The demersal trawl fishery reported a 5 MT by-catch of swordfish in trawling operations, after negligible catches of this species in 1989 and 1990. A targeted sport fishery also started to develop on this species in the vicinity of Cape Point. Tuna game-fishing vessels, fishing at night with rod and reel, established the viability of a swordfish sport fishery by landing a few large swordfish. In response to subsequent submissions from these game fishermen for the protection of this new fishery, the swordfish was declared a "recreational" species off South Africa and may not be exploited as a commercial target species.

2. Tuna research

2.1 Catch and effort data collection

Attempts to improve the tuna catch and effort logbook system continued, with limited success. Efforts were therefore directed at improving liaison with tuna dealers purchasing South African tuna landings. Data from these sources confirmed that tuna catches had been under-reported on tuna catch returns. Catch totals were therefore revised based on dealer purchase records and reported to ICCAT.

2.2 Length-frequency sampling

The reduction in albacore catches resulted in a similar reduction in length-frequency sampling of South African catches and very few fish were measured. Efforts were instead directed at the continued sampling of albacore caught by Taiwanese longliners operating in the Atlantic Ocean on behalf of the ICCAT Port Sampling Program. Taiwanese transshipments continued to decrease and 2,488 albacore were measured from 31 Taiwanese longliners transshipping 2,673 MT of albacore and 77 MT of other tunas in Cape Town harbour.

2.3 Albacore morphometric sampling

During the 1990 meeting of the Albacore Working Group, it was noted that the creation of a catch-at-size data base for south Atlantic albacore was complicated by difficulties in converting some south Atlantic size data measured in LD1 to fork length measurements. South Africa accordingly initiated a limited morphometric sampling program of South African and Taiwanese albacore in order to determine conversion formulae for various measurements. It is hoped that these conversion formulae will be available in mid-1993 for use in a revised assessment of the south Atlantic albacore stock at the 1993 SCRS meeting.

* Original report in English.

2.4 Shark fishery monitoring

In a controversial development in the South African linefishery, numerous linefishing vessels used previously inactive tuna longlining permits to develop a demersal longline fishery targeting adult hake (*Merluccius sp.*). The directed and incidental catch of sharks in this bottom longline fishery also increased rapidly, finally resulting in the issue of 21 directed shark longline permits. A logbook monitoring system has been introduced for this fishery and shark CPUE trends will be closely monitored.

Table 1. Total reported catches (in MT) by the South African surface baitboat fishery in the south Atlantic Ocean during 1990 and 1991

Species	*1990*	*1991*
Albacore	4,215	2,724
Yellowfin tuna	338	38
Bigeye tuna	261	68
Skipjack tuna	18	14
Swordfish	-	5
TOTAL	4,832	2,849

NATIONAL REPORT OF SPAIN*

by

Spanish Institute of Oceanography (IEO)

1. State of the fisheries

Spanish catches of tunas and swordfish rose to 187,154 MT, which represents an increase of 5 percent over the 1990 catch and 14 percent with respect to the average of the last four years (Table 1). The trend is towards a constant increase, due mainly to the increase in the catches of tropical tunas, which, in the case of skipjack and bigeye, registered a 56 percent increase as compared to the previous year.

2. Fisheries and research by areas

2.1 Temperate area

-- Bluefin tuna

The catches of bluefin tuna in the Atlantic (Bay of Biscay baitboat fishery and traps) continued to decline and at present are at the lowest values of the last 10 years (2,240 MT in 1991; 2,171 MT in 1981). The number of vessels (15-20) and traps (4) corresponding to these fisheries remained at the same level as in previous years.

The Mediterranean traps were reduced by one, with only two traps now in operation.

Baitboat catch and effort in the Mediterranean increased with respect to the previous year; there were five vessels in operation.

In the fall, various baitboat vessels from northern Spain caught bluefin tuna in the Mediterranean.

Biological sampling was carried out (maturity and sex ratio) on bluefin from the trap and longline fisheries in the Mediterranean. The study on sex ratio was also carried out on the traps in the Strait of Gibraltar area.

In October and November, two tagging cruises, financed by the EC, were carried out on juvenile bluefin tuna in the western Mediterranean. During these cruises 2,314 bluefin were tagged. Several recoveries were obtained in the French purse seine fisheries a year later. A bluefin tuna was also recovered in the Atlantic purse seine fishery of Morocco one year after release.

-- Albacore

The 1991 catches of albacore were less than in recent years. The major part of these catches were obtained in the northeastern Atlantic. The summer fishery, which takes the majority of the catches, obtained 7,560 MT with live bait (46 percent), whereas the troll fishery caught 8,955 MT (54 percent). The combined fishery registered a decline of 32 percent with respect to 1990.

The number of vessels remained constant: 500 trollers and 250 baitboats; effort declined by 22%.

Part of the Atlantic baitboat fleet moved to the western Mediterranean in the fall, and 547 MT of albacore were taken. Part of this fleet also caught adult-sized albacore in the area around the Azores Islands (614 MT).

In August, 1991, a baitboat tagging cruise was conducted in the Bay of Biscay. During the cruise, 4,219 albacore were tagged. Of these, 1,494 albacore were injected with oxytetracycline (some of these fish have been recovered whole, more than a year after release).

-- Swordfish

The results of swordfish fishing in 1991 were similar to those of the year before, as regards catches and CPUE.

* Original report in Spanish.

In the north Atlantic, the average weight of the catch increased slightly as compared to previous years, thereby halting a declining trend in the series.

Sampling coverage, as regards the number of fish measured, was 56 percent, which represented an increase over the previous year. There were 133,000 swordfish measured. The most significant improvements were in the freezer fleet, due for the most part, to placing observers on board the vessels and to the introduction of IEO logbooks. The majority of the vessel captains completed the logbooks voluntarily.

Opportunistic tagging continued on board commercial longliners in the Atlantic as well as in the Mediterranean.

Biological sampling was carried out (maturity and sex ratio) on swordfish from the Atlantic and Mediterranean fisheries. Scientists also collaborated in mitochondrial DNA studies.

2.2 Canary Islands area

Spanish catches in 1991 amounted to 13,523 MT, which represent a 31 percent increase with respect to the previous year, in spite of there having been a self-imposed regulation due to market difficulties.

The highest catches were of skipjack tuna (5,751 MT), followed by bigeye tuna (5,129 MT), and yellowfin tuna. These species constituted 98.6 percent of the total caught. Catches of albacore and bluefin tuna continued to decline, to half the catch taken in 1990.

The number of fishing vessels in the area was 386, which was more than the year before, although it should be taken into account that some vessels alternated tuna fishing with that for other species.

Fishing effort, in number of trips and in days at sea, increased slightly, in spite of market difficulties.

In July, 1992, a tagging cruise was carried out in waters off the island of La Gomera. Some 1,333 skipjack and 7 yellowfin tunas were tagged, and a study was initiated on skipjack feeding. The objective of this study was to update the most adequate methodology for species such as skipjack.

2.3 Tropical area

Spanish catches in the eastern tropical area were the highest for this fishery (134,223 MT). Skipjack catches made up the major component of the catch (55,679 MT), followed by bigeye catches, which in 1991 doubled with respect to the previous year.

Thirty-seven (37) purse seiners operated in 1991, two more than in 1990. The vessel carrying capacity was 22,769 MT, slightly higher than in the previous year. Fishing effort, expressed in days fishing and searching days, remained at the same level.

In 1991, two Spanish baitboats caught 670 MT of tunas (yellowfin, bigeye and skipjack) in this area. The landings were made at the port of Dakar.

Two Spanish purse seiners fished during six months in the west Atlantic. Catches reached 3,092 MT (1,451 MT of yellowfin tuna, 1,592 MT of skipjack tuna, and the remainder of other species)

Table 1. Spanish catches (MT) of tunas and swordfish, 1987-1991

Species	*1987*	*1988*	*1989*	*1990*	*1991*
Yellowfin tuna	62,943	46,517	61,640	68,605	59,753
Skipjack tuna	37,757	52,188	35,300	47,834	72,642
Bigeye tuna	7,342	7,083	7,660	10,355	18,056
Albacore	29,013	27,735	25,447	25,876	17,980
Bluefin tuna	3,392	5,708	5,012	4,629	3,717
Swordfish	12,269	15,954	16,485	13,959	12,555
Small tunas	5,281	7,730	5,077	6,052	2,451
TOTAL	157,997	162,915	156,621	177,310	187,154

NATIONAL REPORT OF THE UNITED STATES: 1992*

by

National Marine Fisheries Service (NMFS)

1. Fisheries monitoring

Total reported U.S. landings of tuna and tuna-like fishes (excluding billfishes, king and Spanish mackerels) from the Atlantic Ocean, Gulf of Mexico and Caribbean Sea in 1991 were 14,714 MT (Table 1). This represents an increase of 189 MT from 1990.

Bluefin tuna. The U.S. bluefin tuna fishery continues to be regulated by quotas, limits on catches per trip, and size limits. To varying degrees, these regulations are designed to restrict total U.S. landings to preserve the monitoring nature of the fishery, and to direct effort at large bluefin (> 196 cm SFL). Regulations governing the U.S. fishery were updated in 1992 to be in conformity with the 1991 ICCAT agreements for additional conservation measures for this species.

U.S. vessels fishing in the northwest Atlantic in 1990 killed an estimated 1,780 MT of bluefin tuna, of which 1,581 MT were landed. Those estimated landings represented a decrease of 55 MT from the estimated 1990 level. The 1991 landings by gear were: 237 MT by purse seine, 129 MT by harpoon, 341 MT by hand line, 177 MT by longline (of which 165 MT were from the Gulf of Mexico), 696 MT by rod and reel (of which 483 MT was the estimated catch of the small bluefin fishery off the northeast U.S.), and 2 MT were taken by other gears. The estimated catch of small bluefin tuna was the highest on record, exceeding the next highest catch (revised 1990 estimate of 476 MT) by 7 MT. In addition to landed catch, an estimated 1,041 bluefin (about 199 MT) were discarded dead by U.S. longline vessels. Of those discards, an estimated 42 fish (about 11 MT) were caught in the Gulf of Mexico, which is a substantially lower estimate than from the prior three years (107 MT, 194 MT, and 45 MT for 1988, 1989, and 1990, respectively.

In response to new (1992) regulations limiting the allowable catch of small fish by U.S. fishermen, in conformity with ICCAT agreements, enhanced monitoring of the rod and reel fishery was implemented for the purpose of providing near real-time advice on catch levels by this fishery. This monitoring activity is further discussed in greater detail in several scientific documents submitted to the SCRS.

Swordfish. U.S. vessels landed 4,254 MT of swordfish in 1991, a 23 percent decline from the revised landing figure of 5,494 MT for 1990. U.S. regulations, which are in conformity with the ICCAT recommendations for the conservation of Atlantic swordfish, and which placed limits on the U.S. allowable landings of swordfish, were put into effect in 1991. The regulations established an annual allowable catch of Atlantic swordfish of 4,163 MT and established a minimum size limit of 25 kg or 78.7 cm carcass length, measured along the body contour from the cleithrum to the anterior portion of the caudal keel, with a 15 percent allowance for undersized swordfish based on the total number of swordfish landed per fishing trip. These regulations were based on the 1990 swordfish stock assessment and ICCAT-adopted measures to reduce fishing mortality on swordfish. The landings by ICCAT area for 1991 (compared to 1990) were: 680 MT (506 MT in 1990) from the Gulf of Mexico; 1,782 MT (3,054 MT in 1990) from the northwest Atlantic; 788 MT (1,059 MT in 1990) from the Caribbean Sea; and 1,005 MT (875 MT in 1990) from the north central Atlantic. U.S. swordfish landings are monitored and tracked from reports submitted by dealers, vessel owners and captains, NMFS port agents, and mandatory daily

* Original report in English.

logbook reports submitted by U.S. vessels permitted to fish for swordfish. An additional monitoring activity for the swordfish fishery was instituted in 1992. In response to ICCAT recommendations, a randomized observer sampling plan for the entire U.S. longline fleet was implemented to provide estimates of catch rates and discard mortality rates for undersized swordfish. The U.S. observer program is described in detail in several scientific documents submitted to the SCRS.

Yellowfin tuna. Yellowfin tuna is the principal species of tropical tuna landed in the western north Atlantic. Total landings increased to 5,869 MT in 1991, from the 1990 landings, revised to 5,287 MT. The majority of the increase occurred off the U.S. east coast (NW Atlantic) because of reported purse seine landings of 996 MT in 1991, as compared to only 52 MT in 1990. The 1991 purse seine landings came from three vessels fishing off the U.S. east coast between Cape Hatteras, North Carolina, and Long Island, New York. Large bluefin tuna is the principal target of the fleet of five to which these vessels belong. Longline and recreational rod and reel catches of yellowfin tuna also were substantially larger off the eastern U.S. coast in 1991 than in 1990. Gulf of Mexico landings of yellowfin tuna declined slightly from 1990 to 1991, from 3,610 MT in 1990 to 3,217 MT in 1991. Almost all of these landings were by longline vessels. The Caribbean yellowfin catch was smaller in 1991 than in 1990, declining from 387 MT in 1990 to 42 MT in 1991. There were no Caribbean purse seine landings in 1991, and longline landings were much smaller than in 1990.

Bigeye tuna. Bigeye tuna is the other large tropical tuna caught by U.S. vessels in the western north Atlantic. These vessels caught 933 MT of bigeye in 1991, as compared to 650 MT in 1990. Most of the U.S. bigeye catch comes from the area off the U.S. east coast from Cape Hatteras, North Carolina, to Massachusetts. The catch is mainly by longline.

Skipjack tuna. Small quantities of skipjack tuna are also caught by U.S. vessels in the western north Atlantic. Total skipjack landings increased from 240 MT in 1990 to 774 MT in 1991. Most of the catch is by purse seiners and is taken off the U.S. east coast (NW Atlantic) between Cape Hatteras and Long Island.

Albacore. Albacore are landed by U.S. vessels, but this species contributed significantly less to the total U.S. tuna production than do bluefin, yellowfin, bigeye, or skipjack tunas. This species has not been a target of any of the U.S. tuna fisheries that operate in the north Atlantic. Catches of albacore by U.S. fishermen were generally very low prior to 1985, averaging about 16 MT. Since 1986, U.S. catches rose substantially and close to 97 percent of the production has come from the northeastern U.S. coast in most years. Reported catches of albacore were 344 MT in 1991, a minor decline from the 1990 catch of 386 MT (revised upwards from 381 MT as reported in 1991). The proportion of albacore taken as incidental tuna catch has increased in recent years. In 1986, the harvest by longline, handline, and gillnet boats was 24 percent of the total albacore harvest, while the proportion of the 1991 harvest was 59 percent. Albacore are, however, a direct target of recreational fishermen off the northeastern U.S. coast. This fishery is seasonal, and the estimated catch of this fishery is 115 MT (33 percent of the total yield) in 1991. Albacore are also taken incidentally in the commercial fisheries, and until recently these incidental removals were low in relation to the recreational harvest. These incidental fisheries were the longline (swordfish, yellowfin, and bigeye) gillnet (swordfish) and handline (bluefin) fisheries. The longline component of albacore landings, in particular, is increasing.

Billfishes. Blue marlin, white marlin, and sailfish are landed by recreational rod and reel fishermen and are a major by-catch of the U.S. commercial tuna and swordfish longline fisheries. This year (1991) represents the third full year of compliance under the regulations of the U.S. Fisheries Management Plan for Atlantic Billfishes, which was implemented in October, 1988. The preliminary estimates of 1991 U.S. recreational catches for these billfish species, combining the ICCAT geographical areas of the Gulf of Mexico, the northwest Atlantic west of 60°W longitude, and the Caribbean Sea are 19.8 MT for bluefin marlin, 5.3 MT for white marlin, and 1.6 MT for sailfish. The estimates for 1990 were 25 MT, 17 MT, and 1.2 MT, respectively, for the three species. The estimates for the U.S. recreational catch

(landings) assume that the recreational data base includes all billfish landed and does not include any estimates of mortality or released fish. It thus assumes that there is no substantial mortality of billfish in the recreational fishery.

Preliminary estimates for 1991 of billfish that were discarded by-catch in the U.S. commercial longline fishery in Areas 91, 92, 93 and 94A (the north central Atlantic), and presumed to be dead, were 187.4 MT for blue marlin, 38.4 MT for white marlin, and 36.9 MT for sailfish. The estimated 1990 U.S. commercial by-catch kill of billfish was 205 MT, 39 MT, and 21 MT, respectively, for the three species.

Mackerel. U.S. fisheries on Spanish and king mackerel are strongly regulated by federal quotas, size restrictions, and separate state trip-specific landing limits. Both mackerel species are harvested by commercial and recreational fishermen. Management policies are defined for separate migratory groups, Atlantic and Gulf of Mexico, that have been placed under a rigid rebuilding plan because three of the four stocks exploited are considered over-fished. The Atlantic and Gulf of Mexico Spanish mackerel stocks are over-fished and the Gulf of Mexico king mackerel stock is considered over-fished. Over the past 20 years both species have been intensely harvested by gillnets and recreational rod and reel fishermen throughout their ranges. King mackerel have been taken by commercial troll gear as well.

To varying degrees, harvest of both species has stabilized in recent years. Most of this stabilization was the direct result of the impact of regulations which have been implemented in an effort to sustain future production. King mackerel removals have ranged from 4,363 MT to 7,264 MT since 1983, with an average production of 5,484 MT over the most recent five years of rigid management. Removals of Spanish mackerel have ranged from 2,784 MT to 5,957 MT over the same period and since 1986 have averaged 4,968 MT. Landings for 1991 are preliminary and incomplete and are not included in these averages.

Sharks. Revised landings statistics show that the shark landings have declined to 4,899 MT (10.8 million pounds). This is the second year of decline for reported shark landings, which reached a peak of 5,851 MT (12.9 million pounds) in 1989. The revised landings data are being utilized in an updated assessment of shark resource status.

2. Research activities

Major research activities on large pelagic fish in 1991 and 1992 included the continued monitoring of landings and size of swordfish, bluefin tuna, and other large pelagic species; initiation of observer sampling in the U.S. large pelagic fleet; initiation of research activities in response to the ICCAT Bluefin Year Program (BYP); continuation of activities in response to ICCAT-recommended research primarily directed at determining the reproductive biology of Atlantic swordfish; investigation into the development of new indices of abundance for swordfish; participation in the 1992 ICCAT Swordfish Stock Assessment Meeting in Madrid, Spain; continuation of port and tournament sampling of billfishes and other pelagics; coordinating further increased efforts related to the ICCAT Enhanced Research Program for Billfish; continuation of bluefin larval surveys; and convening the Second ICCAT Billfish Workshop. The cooperative tagging program tagged and released 7,653 billfishes and 2,079 tunas in 1991, increases of 10 percent and 65 percent over 1990, respectively. These activities are reported in more detail in the 37 scientific working documents submitted to the 1992 SCRS by the U.S. scientific delegation.

Table 1. Catches and landings (MT) of Atlantic tunas and tuna-like fishes, excluding billfishes, by U.S. fishermen, 1967-1991[1]

Year	BFT[2]	YFT[3,4]	ALB	BET[3]	LTA	SKJ[3]	BON	SWO[5]	SSM[6]	KGM[6]	OTH[7]	TOTAL[8]
1967	2,320	1,136	0	0	7	493	22	474	3,577	2,767	10	10,836
1968	807	5,941	0	18	6	3,314	43	274	5,342	2,813	2	18,570
1969	1,226	18,791	0	148	7	4,849	98	171	4,952	2,814	1	33,068
1970	3,327	9,029	0	195	158	11,752	83	287	5,506	3,050	-	33,395
1971	3,169	3,764	0	544	5	16,224	90	35	4,713	2,571	50	31,168
1972	2,138	12,342	10	212	212	12,290	24	246	4,863	2,213	-	34,565
1973	1,294	3,590	0	113	20	21,246	261	406	4,437	2,710	-	34,102
1974	3,638	5,621	13	865	51	19,973	92	1,125	4,990	4,747	1	41,715
1975	2,823	14,335	1	67	67	7,567	117	1,700	5,288	3,095	19	35,590
1976	1,931	2,252	0	28	5	2,285	23	1,429	6,385	4,053	30	19,023
1977	1,956	7,208	2	331	53	6,179	268	912	5,453	3,837	71	26,955
1978	1,848	9,747	9	248	113	8,492	224	3,684	3,310	2,507	31	30,213
1979	2,297	3,182	11	212	12	3,102	502	4,618	2,926	6,293	11	23,167
1980	1,505	2,118	21	202	88	3,589	195	5,624	5,429	10,726	513	30,010
1981	1,530	1,866	54	152	97	5,373	333	4,529	2,748	12,565	200	29,447
1982	812	883	126	377	87	731	209	5,086	3,747	9,863	962	22,883
1983	1,394	226	18	255	107	589	253	4,801	2,784	7,069	453	17,949
1984	1,320	1,252	25	408	41	817	217	4,538	3,904	7,264	883	20,669
1985	1,423	6,259	17	353	74	1,786	109	4,618	3,984	6,010	247	24,880
1986	1,680	5,775	162	747	103	1,004	83	5,100	5,957	5,682	337	26,630
1987	1,561	6,993	270	1,008	118	650	130	5,160	5,071	5,628	386	26,975
1988	1,500	9,361	115	702	204	36	88	6,129	5,097	5,809	430	29,471
1989	1,732	7,381	260	762	128	56	278	6,385	4,443	4,363	334	26,122
1990	1,769	5,287	386	650	173	240	298	5,494	4,272	5,936	228	24,733
1991	1,780	5,869	345	933	198	774	442	4,254	4,272	5,936	119	24,922

[1] Estimates of recreational catches off the northeast U.S. are included for all years for bluefin tuna and for all other tunas since 1986.
[2] Includes estimated bluefin dead discards since 1986. (The 1986 estimate covered only some times and areas.) Catch revised for 1986-89.
[3] Prior to 1981, figures include some catches of purse seiners flying other flags (Bermuda, Netherlands Antilles, Nicaragua, and Panama).
[4] Includes small quantities of bigeye tuna prior to 1975.
[5] Swordfish landings revised for 1990.
[6] Does not include recreationally-caught Spanish (1967-83) and king (1967-78) mackerel. Mackerel landings revised for 1988-1990. 1991 landings are set equal to 1990 since 1991 data are still preliminary.
[7] 1990 landings revised for all tunas.
[8] Total revised for 1988-90.

NATIONAL REPORT OF VENEZUELA*

by

General Sectorial Directorate of Fisheries & Aquiculture

1. The fisheries

Catches of tunas in 1991 by the Venezuelan fleet in the Caribbean Sea and the west Atlantic amounted to 28,896 MT, which represents an increase of 11,873 MT (70 percent), with respect to 1990 (Table 1). This increase was due for the most part to the 63 percent and 19 percent increase in fishing effort of the purse seine and baitboat vessels, respectively (Table 2).

In the breakdown of the catches, by species and by gear, also shown in Table 2, the yellowfin (*Thunnus albacares*) catches amounting to 22,073 MT are noteworthy (76 percent of the total catch), followed by skipjack (*Katsuwonus pelamis*) with 4,208 MT (15 percent). It should be pointed out that the total landings of billfishes (72 MT, 60.5 percent) correspond to swordfish (*Xiphias gladius*) catches, taken by a fleet of five Oriental longliners whose target species is swordfish.

The tuna fleet that operated in the area was comprised of 49 fishing vessels (14 baitboats, 8 purse seiners and 27 longliners).

2. Research

The "Fondo Nacional de Investigaciones Agropecuarias" (FONAIAP) continued to carry out research activities on the resource of tunas and tuna-like species (swordfish, billfishes), in support of ICCAT. Other national institutes, such as the Ministry of Agriculture and Cattle Breeding, through the General Sectorial Directorate of Fisheries and Aquiculture (D.G.S.P.A.), and international organisms, such as the ORSTOM of France and the U. S. National Marine Fisheries Service (NMFS).

Research activities centered on biological sampling and species composition, complemented by checks at the landing sites and observers on-board commercial vessels. The research aims are to improve the fishery statistics, to study the variation in the abundance of tunas and tuna-like species, to determine tuna catchability, and to obtain biological information.

3. Biological sampling (tunas)

In 1991, size sampling was carried out on 7,852 tunas from the surface fishery (baitboat and purse seine). Of these, 3,307 yellowfin (*Thunnus albacares*), 1,093 frigate tuna (*Auxis thazard*), 18 albacore (*Thunnus alalunga*), 181 bigeye (*Thunnus obesus*), and 473 blackfin tuna (*Thunnus atlanticus*) were sampled. The number of tunas measured decreased by 4 percent as compared to 1990, which is due, in part, to the fact that the baitboats unloaded their catches at ports other than Cumaná, that were not included in the national sampling plan, and did not have trained samplers.

Sampling of recreational billfish tournaments continued.

4. On-board observer program

This program, which started in 1987 to carry out extensive study of the billfish species and which is financed by ICCAT, continued during this year. Biological and fishery information relative to tunas and tuna-like species (billfishes and swordfish) was obtained from observers on-board seven tuna longliners and seven longliners targeting swordfish.

* Original report in Spanish.

During these cruises, size sampling of 492 tunas, 140 marlins and 720 swordfish was carried out.

5. The artisanal fishery (billfishes)

In 1991, port sampling activities were started on billfishes at Playa Verde (La Guaira) and Juan Griego (Margarita Island).

6. Preliminary 1992 data

6.1 The fisheries

Tuna catches in the Caribbean Sea and the west Atlantic declined to 6,263 MT during the first quarter of 1992, which represents a decrease of 988 MT (14 percent) with respect to the first quarter of 1991.

6.2 Research

Port sampling of the surface catches continued, as did sampling of the catches on-board longline vessels through the observer program.

6.3 Artisanal fishing (billfishes)

Sampling of the catches of these species continued at Playa Verde (La Guaira). Up to September, 1,605 individuals were sampled: 1,113 sailfish (SAI), 295 blue marlin (BUM), 102 white marlin (WHM), and 93 swordfish (SWO).

On the other hand, at Juan Griego (Margarita Island) 2,247 fish were sampled up to September: 1,265 sailfish, 693 white marlin, 8 spearfish, 2 blue marlin, and 279 wahoo. The sampling was oriented towards collecting size and weight data on gilled and gutted fish.

6.4 Sport fishing (tournaments)

Three tournaments were carried out, of which two were covered by port samplers.

6.5 Tagging

During the months of March and April, 56 individuals were tagged off the central coast of Venezuela (11 white marlin, 14 sailfish, and 31 blue marlin).

7. References

The results of research activities related to the tuna and tuna-like resources were presented in three scientific documents that were submitted to the 1992 SCRS Meeting.

Table 1. Landings (MT) by species, of tunas caught by the Venezuelan fleet in the Caribbean Sea and the west Atlantic, 1990-1991

	1990	*1991*
Yellowfin tuna	12,967	22,073
Skipjack tuna	2,353	4,208
Albacore	239	314
Bigeye tuna	86	473
Blackfin tuna	863	993
Frigate tuna	515	829
Wahoo	--	6
Total	17,023	28,896

Table 2. Effort (in days at sea) of the Venezuelan fleet in the Caribbean Sea and the west Atlantic

Gear	*1989*	*1990*	1991
Baitboat	1,490	1,829	2,190
Purse seine	703	985	1,605

Table 3. Species composition of the landings (in MT) of tunas and tuna-like species, by gear, of the Venezuelan fleet, 1991

Species	*PS*	*BB*	*LL*	*TOTAL*
Yelowfin tuna (YFT)	15,798	5,613	662	22,073
Skipjack tuna (SKJ)	3,461	747	--	4,208
Albacore (ALB)	221	18	75	314
Bigeye tuna (BET)	305	69	99	473
Blackfin tuna (BLF)	993	--	--	993
Frigate tuna (FRI)	720	109	--	829
Wahoo (WAH)	--	--	6	6
Billfish (BIL) *	--	--	119	119
Sharks (TIB)	--	--	201	201
TOTAL	21,498	6,556	1,162	29,216

* Sailfish (SAI), White marlin (WHM), Blue marlin (BUM), Swordfish (SWO), Spearfish (SPF).