INTERNATIONAL COMMISSION
for the
CONSERVATION of ATLANTIC TUNAS

R E P O R T
for biennial period, 1970-71
PART II
English version

MADRID, SPAIN 1971

INTERNATIONAL COMMISSION FOR THE CONSERVATION OF ATLANTIC TUNAS

Member Countries

Brazil, Canada, France, Ghana, Japan, Korea, Morocco, Portugal, South Africa, Spain, U.S.A.

Chairman of Commission

Mr. F. MARCITLLACH GUAZO
Director General de Pesca Marítima
Madrid. Spain

First Vice-Chairman of Commission

Mr. J. N. N. ADJETEY
Chief Fisheries Officer
Accra, Ghana

Second Vice-Chairman of Commission

Mr. J. TOUYA
Directeur des Pêches Maritimes
Paris, France

Panel Membership

Panel	Contracting Parties	Chairman
1	Brazil, France, Ghana, Japan, Morocco, Portugal, Spain, U.S.A.	U.S.A.
2	Canada, France, Japan, Morocco, Portugal, Spain, U.S.A.	Morocco
3	Brazil, Japan, South Africa, U.S.A.	Japan
4	Brazil, Japan, Portugal, Spain, U.S.A.	Brazil

Council

Chairman: SPAIN
First Vice-Chairman: GHANA
Second Vice-Chairman: FRANCE
Countries: BRAZIL, CANADA, JAPAN, MOROCCO, PORTUGAL, SOUTH AFRICA, U.S.A.

Standing Committees

Committees:	Chairman
Committee on Research and Statistics (SCRS)	Mr. V. VALDEZ, Portugal
Committee on Finance and Administration (STACFAD)	Dr. W. M. SPRULES, Canada

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

LETTER OF TRANSMITTAL

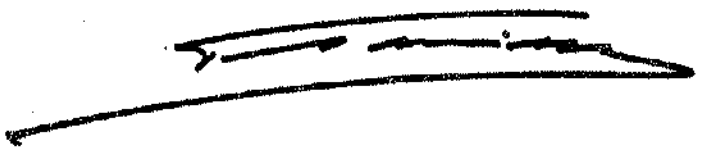
May 12, 1971

The Chairman of the International Commission for the Conservation of Atlantic Tunas presents his compliments to the Member Governments to the Convention signed at Rio de Janeiro on May 14, 1966 and to the Delegates and Observers representing said Governments, and has the honor to transmit the Report of the First Regular Meeting of the Council of the International Commission for the Conservation of Atlantic Tunas and the Standing Committee on Research and Statistics held in Madrid, November, 1970.

An Administrative and Financial report is included, as also a summary of the Auditor's Report on Commission activities during 1970.

Finally, there are also enclosed National Reports on scientific activities related to tuna fisheries carried out by the various countries.

This Report has been drafted, circulated and is approved in conformity with contents of Articles III (9) and IV (2) (d) of the Convention, and Article XV of the Statutes of the Commission. The report is available in the three official languages of the Commission, English, French and Spanish.



F. MARCITLLACH
Chairman

CONTENT

PART I

ADMINISTRATIVE REPORT 1970*

ICCAT/CON/70/21
(Amended)

I. Convention

The text of the International Convention for the Conservation of Atlantic Tuna's was approved at a Conference of Plenipotentiaries held at Rio de Janeiro (Brazil) May 2 to 14, 1966.

The preamble to the Convention states: «The Governments whose duly authorized representatives have subscribed hereto, considering their mutual interest in the populations of tuna and tuna-like fishes found in the Atlantic Ocean, and desiring to cooperate in maintaining the populations of these fishes at levels which will permit the maximum sustainable catch for food and other purposes, resolve to conclude a Convention for the conservation of the resources of tuna and tuna-like fishes of the Atlantic Ocean.»

Article XIV, point 3, states: «This Convention shall enter into force upon the deposit of instruments of ratification, approval, or adherence by seven Governments and shall enter into force with respect to each Government which subsequently deposits an instrument of ratification, approval or adherence on the date of such deposit.»

The Convention has been *signed* by the following countries on the dates indicated:

Brazil	May 14, 1966
Spain	May 14, 1966
U.S.A.	May 14, 1966
Korea	May 31, 1966
Japan	October 28, 1966
Gabon	August 9, 1967
Dominican Republic	February 13, 1968
Venezuela	July 10, 1970

* This report includes slight modifications made at the First Regular Meeting of the Council.

Ratifications and adherences

1.	Ratified by U.S.A.	May 18, 1967
2.	» » Japan	August 24, 1967
3.	Adherence of South Africa	October 17, 1967
4.	» » Ghana	April 17, 1968
5.	» » Canada	August 20, 1968
6.	» » France	November 7, 1968
7.	Ratified by Spain	March 21, 1969 *
8.	» » Brazil	April 1, 1969
9.	Adherence of Portugal	September 3, 1969
10.	» » Morocco	September 26, 1969
11.	Ratified by Korea	August 28, 1970

* Entered in force.

II. Commission

«The Contracting Parties hereby agree to establish and maintain a Commission to be known as the International Commission for the Conservation of Atlantic Tunas, hereinafter referred to as "the Commission", which shall carry out the objectives set forth in this Convention.» (Article III, point 1 of the Convention.)

«The Commission shall hold a regular meeting once every two years.» (Article III, point 4 of the Convention.)

«In order to carry out the objectives of this Convention the Commission shall be responsible for the study of the populations of tuna and tuna-like fishes (the Scombriformes with the exception of the families Trichiuridae and Gemplydae and the genus *Scomber*) and such other species of fishes exploited in tuna fishing in the Convention area as are not under investigation by another international fishery organization. Such study shall include research on the abundance, biometry and ecology of the fishes; the oceanography of their environment; and the effects of natural and human factors upon their abundance. The Comission, in carrying out these responsibilities shall, insofar as feasible, utilize the technical and scientific services of, and information from, official agencies of the Contracting Parties and their political subdivisions and may, when desirable, utilize the available services and information of any public or private institution, organization or individual, and may undertake within the limits of its budget independent research to supplement the research work being done by governments, national institutions or other international organizations.» (Article IV, point 1 of the Convention.)

For having signed and later ratified, or adhered to the Convention as indicated in point 5 of this report, the Commission currently has 11 member countries: Brazil, Canada, France, Ghana, Japan, Korea, Morocco, Portugal, South Africa, Spain and the United States of America.

New Member of the Comission. With the incorporation of Korea (VII/28/70), the Commission therefore has a new member country. Naturally, it has been invited to attend the First Regular Meeting of the Council as an Observer. The additional item is made of record that on VII/28/70 Venezuela signed the agreement which is now pending ratification.

«Each of the Contracting Parties shall be represented on the Commission by not more than three Delegates. Such Delegates may be assisted by experts and advisors.» (Article III, point 2 of the Convention.)

III. First Regular Meeting of the Commission

The Commission held its First Regular Meeting at FAO headquarters from December 1 to 6, 1969.

The Commission decided to establish four Panels of which the following countries are membrers:

Panel Membership 1970/71

Panels	1	2	3	4	Total
Brazil	×		×	×	3
Canada		×			1
France	×	×			2
Ghana	×				1
Japan	×	×	×	×	4
Morocco	×	×			2
Portugal	×	×		×	3
South Africa			×		1
Spain	×	×		×	3
U.S.A.	×	×	×	×	4
	8	7	4	5	24

Panel 1 Tropical Tunas

For yellowfin *(Thunnus albacares)* and skipjack *(Katsuwonus pelamis).*

Panel 2 Temperate Tunas (North)

For bluefin *(Thunnus thynnus)* and albacore *(Thunnus alalunga)* in the northern hemisphere.

Panel 3 Temperate Tunas (South)

For bluefin and albacore in the southern hemisphere.

Panel 4 Other Species

For bigeye *(Thunnus obesus)*, bonito *(Sarda sarda)*, billfishes and other species.

The Commission accepted with pleasure the offer of the Spanish delegation and decided to establish its Seat in Madrid.

The Commission decided to establish the following Committees:

a) Standing Committee on Finance and Administration.
b) Standing Committee on Research and Statistics.

The Commission approved the Rules of Procedure and Financial Regulations.

The Commission decided that at least for the first biennial, its officers might be: an Executive Secretary (P-5), an Assistant Executive Secretary (P-4), an Administrative Assistant (G-6), and a Stenographer (G-4).

The Commission approved the budgets for the 1970/71 biennial, as also contributions corresponding to each of the member countries.

Officers of the Commission

Chairman	Mr. F. MARCITLLACH (Spain)
First Vice Chairman	Mr. J. N. ADJETEY (Ghana)
Second Vice Chairman	Mr. J. TOUYA (France)
Chairman of Standing Committee on Research and Statistics	Mr. V. VALDEZ (Portugal)
Chairman of Standing Committee on Finance and Administration	Dr. W. M. SPRULES (Canada)
Convenor on Subcommittee on Stock Assessment	Mr. J. P. WISE (U.S.A.) (until Nov. 1970)

Panel Chairmen

Panel 1	U.S.A.
Panel 2	Morocco
Panel 3	Japan
Panel 4	Brazil

IV. Council

«There is established within the Commission a Council which shall consist of the Chairman and the Vice Chairmen of the Commission together with the representatives of not less than four and not more than eight Contracting Parties.» (Article V, point 1 of the Convention.)

«The Council shall perform such functions as are assigned to it by this Convention or are designated by the Commission, and shall meet at least once in the

interim between regular meetings of the Commission. Between meetings of the Commission the Council shall make necessary decisions on the duties to be carried out by the staff and shall issue necessary instructions to the Executive Secretary. Decisions of the Council shall be made in accordance with rules to be established by the Commission.» (Article V, point 2 of the Convention.)

The members of the Council were designated by the Commission at its First Regular Meeting, it having been constituted as follows: Chairman of the Commission, First Vice Chairman of the Commission, Second Vice Chairman of the Commission, Brazil, Canada, Japan, Morocco, Portugal, South Africa, United States of America.

V. First Special Meeting of the Council

The Council held its First Special Meeting at the Casa Sindical in Madrid on April 17 and 18, 1970.

The Council declared Mr. O. Rodriguez-Martin the Executive Secretary of the Commission. The Council established terms of employment, emoluments and allowances for Secretariat personnel. It also decided that the Commision, through its Committee on Finance and Administration will continue to revise allowances under the United Nations scheme, with a view to maintaining allowances of Commission personnel as close as possible thereto.

The Council recommended that the Chairman of the Commission enter inmediately into negotiations with the pertinent authorities of the Spanish Government with respect to a possible agreement between the Commission and said Government to accord the Commission and its employees the same privileges and immunities accorded the Olive Oil Council and Specialized Agencies of the United Nations.

VI. Commission offices

Offices of the Commission Seat are on the 7-th floor, General Mola, 17, Madrid. They are in a central district and are private property leased by the Government of Spain exclusively for the Seat of the Commission. Premises are about 200 square meters and has the following:

a) 4 rooms for offices.
b) 1 conference room - library, with seating capacity for 20 persons.
c) 1 room for multigraph, stencil machine, photoengraver. It will also serve for storing supplies and documents.
d) 1 additional room which may be made into an office.

The Secretariat will prepare a detailed inventory of furniture, machines and other items on hand in our offices, in order to submit same at the Second Regular Meeting of the Commission.

VII. Agreement on Seat

In accordance with recommendation of the Council to the Chairman of the Commission at its First Special Meeting, the Spanish Ministery of Foreign Affairs has prepared a Draft Agreement between the Spanish Government and the Commission, to be submitted for consideration at the First Regular Meeting of the Council.

The Commission Secretariat prepared English and French versions of the mentioned Draft. These were circulated to the Delegates of member countries in July, 1970. (ICCAT/CON/70/4). The translated English version has recently been corrected and will be among the documents submitted to the Council as ICCAT/CON/70/4 (amended copy). (Decision reached at the Council Meeting in Madrid, 16-20/11/70 is shown in Annex 5 of the Proceeding Minutes of the Council.)

VIII. Publications

The Secretariat has prepared 500 copies of a publication containing the Report of the First Special Meeting of the Council. This has been distributed as document ICCAT/CON/70/19. Since it is a very short text, versions in the three official languages of the Commission have been included in one only volume.

The Council may be interested in considering the desirability of designating a small Publications Sub-Committee to work closely with the Secretariat in all matters pertaining to Commission publications.

IX. Relations with other organizations

FAO. The Secretariat has maintained continuous correspondance with the Fisheries Department of FAO for an exchange of impressions and points of view with regard to organization of Council Meetings and various other aspects. We have recently received from FAO several copies of publications relating to tuna. These will be used at the Meetings of the scientific groups which will precede those of the Council.

FAO has invited the Commission to send representatives to the «Technical Conference on Contamination of Sea Water and its Effects on Marine and Fisheries Resources», Rome, December 9-12, 1970. At its First Special Meeting the

Council decided to take up this matter at the First Regular Meeting to be held in Madrid in November. (The decision reached at the Council is seen in the Proceedings of the Council.)

FAO has invited the Commission to send representatives to the meetings of the Indian Ocean Fisheries Commission, as also to the Representations Committee for Tuna Resources in the Indian Ocean, Rome, October 22-30, 1970. Following consultation with the Chairman of the Commission and upon informing the Chairman of the Committee on Finance and Administration, the Secretariat advised FAO that ICCAT would be represented by Mr. Valdez, Chairman of the Committee on Research and Statistics.

CGPM (FAO). The Secretariat has established contact with the CGPM, requesting collaboration and inviting it to the meetings of the Council.

IATTC. In answer to an invitation extended by the Inter-American Tropical Tuna Commission, the Council at its First Special Meeting designated Mr. W. M. Terry to represent the Commission at the XXII Annual Meeting of IATTC.
The Secretariat has maintained correspondence with the IATTC, whom it has invited to be represented at the First Regular Meeting of the Council, and at the same time offering and requesting close collaboration.

ICES-CIEM. The Secretariat has maintained correspondence with this organization which has proved to be most desirous of and interested in collaborating with the Commission. Invitations have been exchanged for attendance at meetings.
In answer to an invitation and after consultation with the Chairman and with Mr. Touya, Mr. Letaconnoux was designated to represent the Commission at the 58th Meeting of ICES. Copenhagen, September 28-October 7, 1970.

ICNAF. The Secretariat has exchanged correspondence with this organization on the subject of collaboration in future.
Its Chairman, Dr. Needler, replied to our Chairman offering suggestions looking to effective ICNAF/ICCAT relations.

NEAFC. The Secretariat has exchanged correspondence with NEAFC which has stated its total agreement regarding cordial and effective cooperation. It has invited the Commission to send representatives as observers to the annual meeting to be held in London, May 3-8, 1971.

The Commission has received an invitation to attend the XXI Tuna Conference at Lake Arrowhead, California, October 12-14, 1970.
The Secretariat made pertinent representations to achieve attendance in behalf of the Commission at the mentioned Conference. To that end it sought someone whose intention it was to attend the same and who would later attend the First

Regular Meeting of our Council. For the above reasons Dr. Alan Longhurst will represent ICCAT at Lake Arrowhead.

X. Relations with other countries

At the suggestion of Mr. Valdez and Dr. Wise, the Secretariat has extended personal invitations to attend the technical meetings of the Commission on Research and Statistics and the Stock Assessment Sub-Committee, to the following gentlemen: Dr. Joseph (IATTC), Dr. Gulland and Dr. Gertenbach (FAO), Dr. V. Zharov (USSR), Dr. R. T. Yang (China-Taiwan).

It has also invited the following non-member countries to send observers to the First Regular Meeting of the Council: Ivory Coast, Cuba, Italy, Mexico, Senegal, Turkey, Uruguay and Venezuela. Certain of these countries, such as the Ivory Coast, have submitted scientific and statistical information by way of collaboration with Council meetings.

XI. Language

The Secretariat has consulted with Mr. Valdez, Chairman of the Committee on Research and Statistics, regarding the pros and cons of utilizing simultaneous translating services at the scientific level of the meetings of the Committee and Sub-Committee. In the opinion of Mr. Valdez it is very difficult to obtain an accurate translation at this type of meeting, where the subjects under debate are highly specialized and experience in this regard has not been favorable insofar as results obtained.

In view of this criterion, the Secretariat has arranged for simultaneous translating only for those meetings corresponding to the Council. However, at that time a decision must be made regarding the criterion to prevail for future Committee and Sub-Committee meetings of scientists.

XII. Secretariat personnel

The Chairman of the Commission officially installed the Executive Secretary, Mr. Rodriguez-Martin, on July 1, 1970. This is in accordance with the decision of the Council (Madrid, April 17-18, 1970).

Five candidates were submitted in answer to the request for names for an Assistant Executive Secretary. In view of his background and proven experience, Dr. Makoto Miyake (Japan) was elected to fill the post of Assistant Executive Secretary of the Commission. We understand his knowledge and expertise for the discharge of his duties are outstanding and that the Commission will profit greatly by his incorporation into the Secretariat staff.

Dr. Miyake incorporated in late October in order that he could actively participate in the Committee and Sub-Committee meetings of the Council.

Secretarial positions are filled on a temporary basis since October 1 by Miss Ana María Mingote and Mrs. Martha Sussmann.

Thus, until October the Secretariat has operated solely with the Executive Secretary with occasional help of certain administrative personnel having some knowledge of language, though unfamiliar with the specific terminology of international fisheries organizations, an ability which can only be acquired over a period of several months.

Actually, very little time has elapsed since the Executive Secretary took office and we consider great care and thoroughness should be taken in selecting the necessary competent and adequate personnel.

The Secretariat has scheduled a 40-hour work week for its personnel. Saturdays will be free. Insofar as the daily schedule, it is believed advisable to conform to Spanish norms as has been done by the International Olive Oil Council and other such organizations. For further details on rules and regulations of the Secretariat see Annex 5 of the Proceedings of the Council.

XIII. Additional help

By way of additional cooperation it is considered absolutely essential that an employee be hired to perform auxiliary services such as messenger, mailing of correspondence and packages, and eventually, to operate the photocopy and multigraph machines, etc. In order that this appointment may not unduly tax the Commission budget, it is advisable to hire a mature individual whose social security is ensured and who enjoys good health. He should have some experience in the above responsibilities.

It should be borne in mind that this Commission has three official languages and it will probably be necessary to translate rather voluminous documents. To this end it will probably be necessary to seek occasional collaboration for eventual translations.

The Executive Secretary intends to prepare an Organization Manual with specification of emoluments, allowances, responsibilities and rights of the staff. Office organization will be detailed therein. (The decisions by the Council on this matter are contained in Annex 5 of its Proceedings.) The manual will be submitted to the II Regular Meeting of the Commission.

O. Rodríguez-Martín,
Executive Secretary

Office of the Secretariat
October 15, 1970

SUMMARY OF AUDITOR'S REPORT FOR 1970

Contributions made by member countries in order to meet the 1970 budget amounted to $ 67,101.82 (U.S.).

Expenditures charged to the budget totalled $ 36,582.09, which shows a positive balance of $ 30,519.73.

The situation at end of 1970 was as follows:

Positive balance	$ 30,519.73
Interests	16.76
Korean contribution (1970) . . .	1,125.00
Total . . .	$ 31,661.49

Applied to:

1971 Budget appropriation for Special and extraordinary projects . .	$ 30,000.00
Working Capital Fund	1,661.49
	$ 31,661.49

Outstanding 1970 contributions shall also be applied to the Working Capital Fund.

In accordance with Article 12 of the Financial Regulations, there is enclosed a summary of the Auditor's Report, the complete text of which was circulated to all Delegates on March 11, 1971.

Audit and Certification of Appropriations Accounting for the year 1970

INTERNATIONAL COMMISSION FOR THE CONSERVATION OF ATLANTIC TUNAS

Madrid, February 16, 1971

Alejandro Oliver y Trujillo, Member of the Instituto de Censores Jurados de Cuentas de España, Master in Accounting and Business Administration, No. 2208 in the Ilustre Colegio Oficial de Titulares Mercantiles de Madrid, with registered Fiscal Tax License on Proceeds from Personal Labor in order to practice his profession, with offices in this city of Madrid, at Joaquín María López No. 25, telephone 243 07 10

at the behest of the

INTERNATIONAL COMMISSION FOR THE CONSERVATION OF ATLANTIC TUNAS

in Madrid, calle General Mola, 17

having examined and carefully checked the accounts of said Commission, its supporting documents, financial and appropriations statements furnished by it, statements of checking accounts furnished by the Bank which is the depository of its funds, and the Proceedings of its various meetings, in compliance with the ruling in Article 12 of the Financial Regulations adopted at the First Meeting in Rome, Item 7, Second Session, December 5, 1969

CERTIFIES:

First: That the Balance Sheet of December 31, 1970, Statements on Liquidation of Income and Expenditures for the 1970 period and Treasury Statement hereby submitted, concur absolutely with the accounting records of said Commission.

Balance Sheet of December 31, 1970 of the International Commission for the Conservation of Atlantic Tunas

Assets			*Liabilities*		
Banco Exterior de España, dollar account .		$ 30,594.42	*Results of 1970 Estimated Expenses*		
Banco Exterior, peseta account	30,387.89		Applied to Heading 8, 1971 Budget	$ 30,000.00	
Cash on hand in pesetas	44,080.30	1,067.07	Pending application	3,417.91	33,417.91
		$ 31,661.49			
Pending:					
Contributions pending collection 1970		2,898.18	*Working capital fund (12, Annex 6, Rome)*		
GHANA	$ 2,890.00		Contribution by Korea		1,125.00
SPAIN	8.18				
Real Property:			*Acquired Holdings:*		
Office equipment	$ 5,942.08		Through application of budget	9,813.47	
Installations	2,233.22		Through interests and differences in foreign exchange	16.76	9,830.23
Furniture	1,486.61				
Bonds	151.56	9,813.47	TOTALS		$ 44,373.14
TOTALS		$ 44,373.14			
Furniture ceded by Undersecretariat of Merchant Marine of Spain		$ 3,365.38	Undersecretariat of Merchant Marine of Spain, furniture ceded		3,365.38

Madrid, February 16, 1971.

Liquidation of Obligated Income for 1970 Period

Member Countries	*Obligated*	*Receipts*	*Pending*
BRAZIL	$ 6,000.00	$ 6,000.00	
CANADA	3,160.00	3,160.00	
FRANCE	10,300.00	10,300.00	
GHANA	2,890.00		$ 2,890.00*
JAPAN	10,180.00	10,180.00	
MOROCCO	5,380.00	5,380.00	
PORTUGAL	7,330.00	7,330.00	
SOUTH AFRICA	2,790.00	2,790.00	
SPAIN	12,750.00	12,741.82	8.18
U.S.A.	9,220.00	9,220.00	
Totals	$ 70,000.00	$ 67,101.82	$ 2,898.18

Other unobligated receipts:

Contribution of Korea	$ 1,125.00
Checking Account interests and difference in foreign exchange	16.76
TOTAL ACTUAL RECEIPTS	$ 68,243.58

Contributions pending collection as of December 31, 1970:

GHANA	$ 2,890.00*
SPAIN	8.18
Total	$ 2,898.18

* Has since paid its contribution which has been deposited to the Working Capital Fund.

Liquidation of Estimated Expenses 1970 Exercise

Headings	Budgeted	CONTRACTED FOR				Balance
		For Year	Equipment	Bonds	Total	
1 Salaries and Allowances . . .	$ 33,000.00	$ 16,324.05			$ 16,324.05	$ 16,675.95
2 Travel	10,000.00	3,219.00			3,219.00	6,781.00
3 Expenses - Meetings	10,000.00	4,291.85			4,291.85	5,708.15
4 Publications	2,000.00	320.33			320.33	1,679.67
5 Office equipment and supplies .	5,000.00	940.82	$ 3,642.72		4,583.54	416.46
6 Contingencies	10,000.00	1,672.57	6,019.19	$ 151.56	7,843.32	2,156.68
TOTALS	70,000.00	26,768.62	9,661.91	151.56	36,582.09	33,417.91

From the results of Estimated Expenses for the 1970 exercise there have been previously applied at the Fifth Meeting of the First Regular Meeting (Madrid, November 20, 1970), to Heading 8 of the Estimated Expenses for 1971	30,000.00
Pending application	3,417.91
	$ 33,417.91

Status of Treasury as of December 31, 1970

Liquidation of Estimated Income:			
TOTAL INCOME			$ 68,243.58
Liquidation of Estimated Expenses:			
TOTAL EXPENDITURES			36,582.09
BALANCE			$ 31,661.49

Detail of Cash in Bank:

Banco Exterior de España:			
Dollar Checking Account			$ 30,594.42
Peseta Checking Account	$ 30,387.89		
On hand in pesetas	44,080.30		
TOTAL PESETAS	74,468.19	at exchange rate of 69.788	$ 1,067.07
BALANCE			$ 31,661.49

Reconciliation of balances in checking accounts:

Banco Exterior de España, Account 30-17672-A	
Peseta balance as of December 30, 1970	25,387.89
January 2, 1971, correction of magnetic error in entry December 17, 1970 (pesetas)	5,000.00
Balance Equal to that in Accounting (pesetas)	30,387.89
Banco Exterior de España, Account 30-31279-Q	
Balance as of December 31, 1970	$ 34,295.52
To increase: Korean check, maturity on January 20, 1971	1,125.00
TOTALS	$ 35,420.52
To deduct: Several stubs, Checking Account, issued prior to December 31, and collected thereafter	$ 4,826.10
Balance Equal to that in Accounting	$ 30,594.42

Second: That income and expenditure operations reflected in the accounting records and in the statements hereby submitted, adhere to the regulations, the approved budgets, and are in accord with universally accepted norms of administration.

Third: That funds deposited in the bank in the name of said Commission have been checked against documents issued by the same depository bank and that cash on hand has been checked through audit after December 31, by reconciliation of the balance with movements between that date and time of audit.

Attached as an integral part of this certification are:

1. Special study of Estimated Income for the 1970 exercise and of actual income.
2. Special study of Estimated Expenses for the 1970 exercise and of actual expenses.
3. Observations considered necessary.

It is also made of record that the Executive Secretary of the INTERNATIONAL COMMISSION FOR THE CONSERVATION OF ATLANTIC TUNAS as also his staff, have rendered the undersigned auditor every assistance necessary in the performance of his work, furnishing him with whatever documents and justifications he has required.

Madrid, February 16, 1971

Alejándro Oliver y Trujillo
Auditor

PART II

PROCEEDINGS OF THE FIRST REGULAR MEETING OF THE COUNCIL

Madrid, November 16-20, 1970

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Proceedings of the First Plenary Session: 16 November, 1970

Item 1: Opening.

1. The Council of the Commission held its First Regular Meeting under the chairmanship of Mr. Marcitllach at the Casa Sindical, Madrid, Spain.

2. The Chairman welcomed the Delegates of all member countries (First Vice-Chairman Adjetey of Ghana was absent) and observers (see Annex 1 for List of Participants). He particularly emphasized the importance of having an observer from Korea present, since that country became a member only recently. Thanks were expressed to the experts and scientists who worked under the Chairmanship of Mr. Valdez and Mr. Wise the previous two weeks. Particular comment was made of the death of Dr. W. Chapman.

Item 2: Adoption of the Agenda and arrangements for the Meeting.

3. The Council adopted the Agenda, reproduced as Annex 2 hereto. The Delegate for Spain proposed establishment of a small Working Party to Study the rules and regulations of the Secretariat staff. The United States delegation proposed consideration of procedures to be followed at future meetings insofar as Observers and publications, and it agreed to take this up under Item 18 - *Other Matters.*

Item 3: Admission of Observers.

4. All the Observers were admitted (see Annex 1 for list.)

Item 4: Appointment of subsidiary bodies for the Meetings.

5. The Council decided to establish a Working Group on Administration and Finance for the duration of the meetings to study and report on items 5, 6, 7, 8, 9 and 10. All countries members to the Council were invited to participate in this Working Group. Dr. Sprules of Canada was nominated and agreed to accept the chairmanship of this Working Group. It was agreed that Item 9 should be studied after the Council Meeting receives the report of the Standing Committee on Research and Statistics.

6. A small Sub-Working Group was established to consider Item 6 and rules and regulations for the Secretariat staff.

Proceedings of Second Plenary Session: 17 November, 1970

Item 11: Review of the Report of the Standing Committee on Research and Statistics.

Item 12: Report to the Commission with reference to:

a) Coordination of research
b) Next scientific meeting
c) Conservation of resources
d) Statistics
e) Publications
f) Others

7. Mr. Valdez, Chairman of the Standing Committee on Research and Statistics, submitted a report to the Council. He expanded at length upon the report and the Council decided to debate its contents at the next session.

Proceedings of Third Plenary Session: 18 November, 1970

Items 11 and 12 (Continued).

8. The Council agreed that the Sub-Committee on Subpopulation Identification should call a meeting early next spring to coordinate plans for an international tagging program before the next Commission meeting scheduled for the Fall of 1971.

9. It also agreed that $ 10,000.00 out of approximately $ 30,000.00 left over from the balance for the current budget (1970) should be allocated in support of said international tagging projects. This support might take the form of providing funds to purchase tags, develop and distribute publicity regarding the tagging program, and pay rewards for return of the tags.

10. All pertinent details will be the subject of discussion by said Sub-Committee at this meeting. The Convenor (Dr. A. C. Jones) of the aforesaid Sub-Committee then informed that there was general tentative agreement on holding the meeting early in April (5-10) 1971, in Lisbon. The provisional Agenda for this meeting is attached hereto as Annex 3. The Executive Secretary was requested to contact the Delegates of each country either at the current meetings or by correspondence, to obtain the names of their representatives to this Sub-Committee.

11. The Council reviewed the program submitted in the Report of the Standing Committee on Research and Statistics concerning compilation and publication of statistics and recognized that first priority should be given to this matter. Considering the heavy workload which may be required of Secretariat personnel to coordinate the statistical systems of the various countries and in order to encourage and assist in the establishment of such statistical system in certain developing countries, and considering the possible necessity of additional part-time personnel to help in the Secretariat in the computer processing of these voluminous data, $ 10,000.00 will be allocated out of the remaining funds. A substantial portion of these funds would be required for travel by the Secretariat official concerned with statistics.

12. Some delegations underlined the importance of standardizing sampling methods and urged the Standing Committee on Research and Statistics to carry out the task as soon as possible as shown in Section 4 of its Report.

13. With regard to close cooperation with other international organizations in collecting statistics, the Council felt that ICCAT should be represented at the next CWP meeting by the Convenor (Dr. Hayasi) of the Sub-Committee on Statis-

tics, the Assistant Executive Secretary, and Delegations from Portugal and France. The Executive Secretary was asked to ascertain the pertinent procedure for obtaining representation of ICCAT at CWP. The Council agreed that in event the Commission cannot obtain financial support for travel of the Convenor from his own government, the Commission will cover such expenses as well as those of the Assistant Executive Secretary.

14. It was considered desirable to have the use of a computer for analyses during the meetings of the Sub-Committee on Stock Assessment. The Council decided to allocate $ 10,000.00 for this purpose and, if necessary, to cover employment on a temporary basis of a programmer and/or scientist familiar with programs for the analysis and study of population dynamics in order to set up computer programs to be used during the sessions of said Sub-Committee.

15. Precise details directly related to execution of these special and extraordinary projects on tagging, statistics and computer programs will be settled by the Secretary in consultation with the Chairman of SCRS/ICCAT and the Convenors of the appropriate Sub-Committees.

16. The Council agreed that at present all fisheries statistics should flow into the Secretariat through national statistical offices.

17. The Council noted in the Report of the Standing Committee on Research and Statistics that there was discussion on the matter of hiring a scientist to perform stock assessment duties for the Commission. It decided not to discuss the matter at length at this time; is is hoped that the Sub-Committee on Stock Assessment will be able to adequately carry out its important task.

18. The Council decided that ICCAT should send an Observer to the next annual meeting of IATTC (1971) and that the Executive Secretary should attend. It is planned that he will visit IATTC headquarters at La Jolla in conjuntion with this travel.

19. Following the above, the Council approved the Report of the Standing Committee on Research and Statistics.

Proceedings of the Fourth Plenary Session: 19 November, 1970

Item 13: Review of plans for Joint Enforcement of regulatory measures developed by other Commissions. (ICCAT/CON/70/6 and ICCAT/CON/70/7)

20. The Council agreed that the ICNAF-NEAFC inspection system is acceptable as a basis for study; that member Governments be asked to send their views to the Executive Secretary on how ICNAF-NEAFC international inspection procedures could be adopted for use by ICCAT prior to the next regular meeting of the Commission and that the Executive Secretary prepare a compendium of these views to be circulated as an ICCAT document prior to the regular

meeting of the Commission. It agreed further that ICCAT set up a Working Party at the next meeting of the Commission to examine the technical details of the manner in which international inspection procedures can be iniciated by ICCAT. It was also suggested that the Executive Secretary collect and circulate a compendium of the inspection and enforcement systems developed by other international organizations.

Item 14: Relationship with FAO (ICCAT/CON/70/21 and ICCAT/CON/70/28)

21. The Council considered Document no. 28, which was introduced by the Executive Secretary. This document contained a copy of a letter from the Director-General of FAO to the Chairman of ICCAT suggesting methods of co-operation between the two organizations, and a memorandum proposing various alternatives for the establishment of working relations between ICCAT and FAO. The Council agreed that the Chairman of the Commission should take steps to establish an informal working relationship between FAO and the Commission. It felt that it was premature at this stage to consider the establishment of a more formal relationship with FAO.

Item 15: Relationship with IATTC, ICES, ICNAF, NEAFC - Others (ICCAT/CON/70/21 and ICCAT/CON/70/30 bis)

22. The Council reviewed the matter of exchange of observers and correspondence with other international organizations in the past. Recognizing that such close relationships have been of great value, it was agreed that they should be continued.

Item 18: Other Matters.

(i) Criteria for inviting observers to the Commission meetings.

23. The Council agreed that the Executive Secretary should invite countries as observers to Commission meetings according to the following criteria:

a) Countries which participated in the May, 1966 meeting at Rio de Janeiro.
b) All countries having coastlines in the Atlantic Convention waters.
c) Countries fishing tuna in Convention waters and/or where tuna caught in such waters are landed or transshipped.

(ii) Publications.

24. It was agreed that a Working Party should meet prior to the next Regular Meeting and that such Party should review details pertinent to the distribution of Commission publications; also the possibility of making popular publications available to the general public (see paragraph 27).

Proceedings of the Fifth Plenary Session: 20 November, 1970

Item 5: Administrative Report.
Item 6: Agreement on Seat between the Spanish Government and the Commission.
Item 7: Status of financial contributions by Contracting Parties.
Item 8: Report on current state of the Commission's accounts.
Item 9: Review of second half of Biennial Budget.
Item 10: Arrangements for appointment of External Auditor.

25. The Report of the Working Group on Administration and Finance was submitted by Dr. Sprules, Chairman of the Group. The Council approved the entire report as regards all of the above items and it is attached hereto as Annex 4. The report of the Sub-Working Group which is Appendix 1 to the Report of the Working Group is reproduced as Annex 5.

26. With regard to the Assurity Bond (paragraph 13, Annex 4), the Commission decided that it should bond for $ 100,000.00 at this time to cover the Executive Secretary and the Assistant Executive Secretary.

27. The Council decided that a small working party should meet one week prior to the Commission meeting next year, in order to comprehensively review administrative and financial problems. Dr. Sprules was elected Chairman of the Working Party, and Brazil, France, Japan, Morocco, Spain and FAO requested to be members. It was agreed that terms of reference for this Working Party would also include the problems pertaining to publications (paragraph 24).

Item 16: Date and place of next Meeting of the Commission.

28. The Council decided that the next meeting of the Commission should take place in Madrid, Spain, for a week beginning December 2, 1971, to be preceded by meetings of the Sub-Committees and Standing Committee on Research and Statistics for two weeks previous.

Item 17: Date and place of next Regular Meeting of the Council.

29. The Council agreed that a decision on this item should be taken by the Commission at the next regular meeting.

Item 18: Other Matters. (See paragraph 23 and 24.)

30. The Council adopted the report of its previous sessions and requested the Executive Secretary to secure approval of the report of its Fifth Session (20 November, 1970) by correspondence with its members.

Item 19: Adjournment.

Annex 1

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Annex 2

Agenda

I. *Organization of the meeting*

1. Opening.
2. Adoption of the Agenda and arrangements for the Meeting.
3. Admission of Observers.
4. Appointment of subsidiary bodies for the Meeting.

II. *Administration*

5. Administrative Report.
6. Agreement on Seat between the Spanish Government and the Commission.

III. *Finance*

7. Status of financial contributions by Contracting Parties.
8. Report on current state of the Commission's accounts.
9. Review of second half of Biennial Budget.
10. Arrangements for appointment of External Auditor.

IV. *Report of the Standing Committee on Research and Statistics*

11. Review of the Report.
12. Report to the Commission with reference to:

a) Coordination of research.
b) Next scientific meeting.
c) Conservation of resources.
d) Statistics.
e) Publications.
f) Others.

V. *Measures for ensuring application of the provisions of the Convention*

13. Review of plans for Joint Enforcement of regulatory measures developed by other Commissions.

VI. *Relationship with other bodies*

14. FAO.
15. IATTC - ICES
ICNAF - NEAFC - others.

VII. *Other matters*

16. Date and place of next Meeting of the Commission.
17. Date and place of the next Regular Meeting of the Council.
18. Other Matters.
19. Adjournment.

Annex 3

Provisional Agenda for Meeting of Sub-Committee on Subpopulation Identification. Standing Committee on Research and Statistics

Suggested time and place: April 5-10, 1971, Lisbon

I. *Species to be considered:*

a) Yellowfin tuna.
b) Albacore.
c) Bluefin tuna.
d) Others.

II. *Consideration of each species:*

a) Description by member countries of proposed national tagging programs (including vessels, tagging personnel, time schedules, payment for fish tagged).

b) Discussion of proposed national programs.

c) Possible adjustments in proposed national programs and development of coordinated joint program for tagging.

1. Proposed time schedule for joint program.

d) Discussion of details of coordinated joint program.

1. Type of tag.
2. Method of tagging.
   a. Session on tagging techniques.
3. Publicity for tagging program.
4. Collection and return of tags.
5. Payment of rewards for return of tags.
6. Processing and analysis of data on tag returns.

III. *Recommendations for expenditure of ICCAT funds for tagging.*

Annex 4

Report of Working Group on Administration and Finance

1. In accordance with the decision taken at the first session of the Council, the Working Group met during the period November 16-20 under the chairmanship of Dr. W. Sprules (Canada). All members of the Council participated in the Group. It considered items 5, 6, 7, 8, 9 and 10.

2. Also, in accordance with the decision of the First Session of the Council, the Working Group established a small Sub-Working Party to study Item 6, and rules and regulations for the Secretariat staff. This sub-Working Party consisted of Canada (Chairman), Spain, Portugal, the United States of America and FAO as participants. It was agreed that this sub-Working Party would submit its report to the Working Group rather than to the Council.

Agenda Item 5: Administrative Report (ICCAT/CON/70/21).

3. The Working Group reviewed the Administrative Report prepared by the Executive Secretary. With slight modifications and some reservations regarding matters to be discussed in the Council meetings, it approved the report.

4. *Per Chapter XII, Secretariat Personnel.* The Working Group reviewed the report of the Sub-Working Party regarding Terms of Employment of Secretariat staff, rules and regulations thereof, etc. This Report is attached as Appendix 1. The Working Group approved this Report and recommends to the Council that all the suggestions and proposals therein be approved.

Agenda Item 6: Arrangement on Seat between the Spanish Government and the Commission (ICCAT/CON/70/4 amended copy).

5. The Working Group reviewed the report of the Sub-Working Party (Appendix 1) regarding its study of «Draft Agreement Between the Spanish Govern-

ment and the International Commission for the Conservation of Atlantic Tunas.» It *recommends* that said draft be slightly amended according to recommendations stated in the Report of the Sub-Working Party. The Working Party *recommends* that the Council propose to the Commission that it approve the text of the Agreement on the Seat and authorize the Chairman of the Commission to sign the Agreement in its behalf. It further *recomends* that the Executive Secretary submit this proposal in writing to member countries for a vote by mail in accordance with Article 9.8 of the Rules of Procedure. This communication should be addressed to both the heads of the delegations of member countries and to the Ministries of Foreign Affairs.

Agenda Item 7: Status of Financial Contributions by Contracting Parties (ICCAT/CON/70/22).

6. Statement 1 of the Financial Report prepared by the Executive Secretary (Document no. 22) was studied and two pending contributions were noted. The Delegate from Brazil stated that his country's contribution to the 1970 budget would be forthcoming within a few days. It was suggested that a very minor sum due by one country as a result of difference in foreign exchange may be included in and charged to the 1971 annual contribution of that country. The Working Group recommends to the Council that all future payments for contributions be made either in United States dollars or convertible Spanish pesetas.

Agenda Item 8: Report on current status of Commission Accounts (ICCAT/CON/70/22).

7. Statement 2 of the Financial Report (Document no. 22) was studied and minor corrections were made following the decisions and recommendations made by the Sub-Working Party (Appendix 1). This is attached hereto as Appendix 2. It was requested that information on expenses under «Item Contingencies» be further broken down. The table supplying information is attached as Appendix 3.

8. The Working Group agreed to *recommend* that the Council hire a man on a temporary basis at the rather moderate wage of $ 150 per month to perform the specific duties outlined in the Administrative Report, Chapter XIII. It also recomends that the Council authorize the Executive Secretary to expend $ 500 for translations during the current year, if necessary.

9. The Working Group *recommends* to the Council that the Chairman of the Commission should represent ICCAT as an observer at vthe FAO Technical Conference on Marine Pollution and its Effects on Living Resources and Fishing (Rome, December 9-18, 1970) if he attends the Conference as a Delegate for Spain. It further *recommends* that the Executive Secretary should attend said Conference to represent ICCAT in the event the Chairman of the Commission does not attend.

10. The Working Party studied EXHIBITS 4A and 4B in relation to the contribution by Korea as a new member country in the Commission. It *recommends* to the Council that the Executive Secretary write to the Government of the Republic of Korea explaining the basis for and method of calculating the contribution of each member country, informing that country of the amount due the Commission for 1970, on the basis that Korea did not participate in any of the Panels during 1970. It further *recommends* to the Council that in due course the Executive Secretary send another letter to the Government of the Republic of Korea with details as to the amount that country would have to contribute in 1971, depending upon the number of Panels on which it would serve.

Agenda Item 9: Review of second half of Biennial Budget (ICCAT/CON/70/22).

11. It having been decided at the Council meetings that the Commission would carry out several special projects to be financed with the unexpended balance remaining from the 1970 budget and since a revision in the United Nations salary scheme is expected by mid-1971, the Working Group felt that it was necessary to effect some revision of the Commission budget for 1971. It recognized, however, that whether or not the Commission would adhere strictly to the UN scheme is dependent upon the decision of the Commission. Expenses mentioned in paragraphs 12 and 13 of this report were examined. In addition, some minor reallocation of the budget was proposed by the Executive Secretary and it was approved. The revised budget which the Working Group agreed on is attached hereto as Appendix 4 to replace Statement 3 of the Financial Report.

Agenda Item 10: Arrangement for appointment of External Auditor.

12. Following the advice of the Spanish Delegates, the Working Group *recommends* to the Council that the Executive Secretary make the necessary arrangements with «Instituto de Censores Jurados de Cuentas de España» to have the Commission accounts externally audited by said firm.

13. It was proposed that the Secretariat should be covered by an Assurity Bond. The Working Group *recommends* that the Council provide an amount for inclusion in the budget to cover cost of the Assurity Bond for one or two members of the Secretariat staff. Following a suggestion by the Spanish Delegation it *recommends* to the Council that the Executive Secretary consult with «Compañía Española de Seguros de Crédito y Caución» as to their various alternative plans, and after taking the matter up with the Chairman, the Executive Secretary shall decide on the most appropriate plan and arrange to contract for coverage.

Annex 5

(Appendix 1 to Annex 4)

Report of Sub-Working Party

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SAN SEBASTIÁN	Spain
ACIN	
BERMEJO	
ZULUETA	
VAN CAMPEN	U.S.A.
BEASLEY	
VALDEZ	Portugal
POPPER	FAO

1. The Sub-Working Party met on November 17 and 18, 1970 to study the Draft Agreement Between the Spanish Government and the International Commission for the Conservation of Atlantic Tunas, and to review matters pertaining to staff.

2. The Sub-Working Party has found the Draft Agreement between the Spanish Government and the Commission for the Conservation of Atlantic Tunas to be acceptable in general.

Certain minor objections were made with reference to the translation.

3. Slight modifications have been made as follows:

(i) Article 8, paragraph b) should read: «The staff and experts of the International Commission for the Conservation of Atlantic Tunas, as well as staff, representatives and experts of the governmental and non-governmental organizations admitted by the Commission by virtue of consultive agreements.»

(ii) Article 8, subsection 6, line 2 should read: «Section 2» rather than «3» as at present in the English version.

(iii) Article 15, paragraph 1, line 1 of the English version: The propriety of the world «residence» was questioned. It was understood, however, that the term does not imply permanent residence but merely means «stay».

(iv) Article 19, c), line 2. After «exempted» insert: «as well as their children...»

4. Article 19. With regard to 19 b), Señor San Sebastián indicated that the Spanish Government will, whenever possible, extend maximum facilities looking to that interpretation which is the most just and beneficial to Commission officials.

5. Article 19, opening paragraph, line 1: Substitute «Officials in Category P» with «Officials in the Director and Professional category.»

6. The advantages and disadvantages of the Annex being a part of the Agreement, or a separate paper for signing were discussed.

In event the Annex is made a part of the Agreement, reference thereto shall be made at the end of Article 19.

In event it is signed separately, it shall be preceded by a preamble.

It was agreed that the decision would be made by the Spanish Government in the manner it deems most appropriate.

7. In reviewing general employment arrangements, note was taken of the Commission's intent to maintain remuneration of its staff as close as possible to the United Nations common system of remuneration.

8. The representative of FAO pointed out that the United Nations is considering possible adjustments in both its basic salary scale and its post differentials, which could become effective July 1, 1971, if approved by the United Nations General Assembly. He also said that regulations governing the UN Pension Fund had been broadened to allow participation even by international organizations not members of the UN family.

9. To obtain such coverage an organization must contribute an amount equal to 14 % of an employee's gross salary and the employee must contribute 7 % of his salary.

10. The Working Party recommended that the Commission seek to arrange for its staff to receive retirement, death and disability benefits under the UN Pension Fund. It was noted that this might take some time to arrange. ICCAT at present increases the net salary of its employees by 20 % in lieu of benefits described above and in lieu of medical benefits. This payment by ICCAT would need to be reduced by approximately the amount the Commission would have to contribute to the UN Pension Fund when coverage is effected. Nevertheless a small allowance should continue to be provided employees in lieu of medical insurance, which is not available under the UN Pension Fund.

11. In these circumstances, the Working Party recommended that the Executive Secretary's contract should include notations:

a. that the Commission in general intends to maintain salaries comparable with the UN scheme, recognizing that actual changes in remuneration require Commission approval.

b. that current direct payments to compensate for employee disbursements for retirement, etc., are provisional pending alternative opportunity to participate in the UN Pension Fund.

12. Approval of the Executive Secretary's Provisional Contract with the two additions above is recommended.

13. The Working Party recommends that the Commission pay for 1,000 Kgs. of the personal belongings shipped to Madrid by the Assistant Executive Secretary. The FAO Representative said such procedure is in accord with UN allowances for moving when furniture is not shipped by an employee.

14. The Working Party recommended that terms of employment for the Assistant Executive Secretary at Step 1 of the P-4 level approved by the Commission could be developed by the Executive Secretary in accordance with criteria established at the First Special Meeting of the Council.

15. The Working Party noted that the post allowance for the Assistant Executive Secretary of $ 1,400 per annum should be reduced to $ 1,200 per annum to correspond with the amount authorized by the UN scheme for officials at the P-4 level.

16. The Working Party noted that the Executive Secretary intends to prepare an Organizational Manual with specification of emoluments, allowances, responsibilities and rights of the staff. The Manual would then be submitted for approval to the Commission at its next regular meeting. (ICCAT/CON/70/21 - «Administrative Report», paragraph 54.) The Working Party recommended that the Manual be prepared as indicated in accordance with criteria and guidelines previously set forth by the Commission and the Council. The representative of FAO indicated his Organization would be available for consultation in preparing the Manual.

17. The Working Party recommended that, as recommended by the Executive Secretary, a messenger be hired on a temporary basis subject to confirmation by the Commission at its next Biennial Meeting. The salary for this temporary position should be $ 150.00 a month without provision for any additional allowance.

Annex 6

(Appendix 2 to Annex 4)

STATEMENT 2

Fiscal year 1970

(January 1 - December 31, 1970)

BUDGET, EXPENSES AND BALANCE (estimated beginning 10/31/70)

	I Appropriated by Commission at its First Regular Meeting	II Obligations incurred to October 31, 1970	III Expenses estimated for remainder of fiscal year	IV Total obligations for fiscal year 1970	V Balance (estimated)
1. Salaries, allowances . . .	$ 33,000.00	$ 7,890.55	$ 9,258.52	$ 17,149.07	$ 15,850.93
2. Travel	10,000.00	1,370.00	1,809.00	3,179.00	6,821.00
3. Expenses - Meetings	10,000.00	976.76	4,460.00	5,436.76	4,563.24
4. Publications	2,000.00	320.33	—	320.33	1,679.67
5. Office equipment and supplies .	5,000.00	3,840.94	1,000.00	4,840.94	159.06
6. Contingencies	10,000.00	6,833.85	1,000.00*	7,833.85	2,166.15
	$ 70,000.00	$ 21,232.43	$ 17,527.52	$ 38,759.95	$ 31,240.05

This statement reflects amendments made by the Council at its First Regular Meeting.

* Correspondence and miscellaneous.

Annex 7
(Appendix 3 to Annex 4)

Explanation of Chapters 5 and 6, Statement 2 of Financial Report
(ICCAT/CON/70/22)

Chapter 5 - Office equipment and supplies	*Expenses*
1 Calculating machine 3 Typewriters (2 of them electric)	$ 1,397.78
Tables, chairs, file cabinets, bookshelf	1,162.14
Calculating machine (second one)	674.76
Photocopy paper	174.86
Office supplies	431.40
TOTAL	$ 3,840.94

Chapter 6 - Contingencies	
Model 650 Rex-Rotary Multigraph Model 2000 Rex-Rotary electronic stencil cutter	$ 2,041.54
A.B. DICK 622 electrostatic reproducing machine	1,294.78
AEG air conditioners	2,149.65
Olympia postage meter	533.82
Deposit on postage meter	287.28
Mailing	517.05
Loss through exchange rates	9.73
TOTAL	$ 6,833.85

Annex 8

(Appendix 4 to Annex 4)

1971 Budget

The Working Party studied the draft budget submitted by the Executive Secretary and with regard thereto reached the following decisions:

1. To transfer to the 1971 budget the aproximate sum of $ 30,000 estimated as the positive balance of the 1970 budget. Thereby, the 1971 budget, approved at the First Meeting of the Commission (Rome, December 1-6, 1969) totalling $ 100,000, reaches a total of $ 130,000.

2. With regard to distribution per chapter, certain amendments are made:

a) The first four chapters remain unchanged.

b) Chapter 5, under the heading «Office equipment, stationery» ($ 3,000) retains the title only of «*Office equipment*» to which $ 1,500 are allocated, the remaining $ 1,500 are allocated to the subsequent chapter.

c) Chapter 6 will be headed «*General operating expenses*» and, among other expenses, will cover the following: Office supplies (broken down from Chapter 5), communications, auditing services, Assurity Bond, maintenance of the office and its equipment, etc.

d) Chapter 7 will be headed «*Miscellaneous expenses*» and will cover miscelaneous and unforeseen expenses.

e) Chapter 8 will be headed «*Special and extraordinary projects*». The estimated balance from the 1970 fiscal year ($ 30,000) has been allocated to this chapter, to be distributed among the three subchapters a), b) and c) as indicated.

3. Sums allocated to each chapter appear as follows.

BUDGET 1971 (1)

	US Dollars
Total Budgeted	$ 100,000.00
	$ 100,000.00

Chapter:

1. Salaries, Allowances, etc.	67,000.00
2. Travel	12,000.00
3. Meeting costs	15,000.00
4. Publications	3,000.00
5. Office equipment, stationery	3,000.00

READJUSTMENTS IN 1971 BUDGET (2)

	US Dollars
Total	$ 100,000.00
Allocations of estimated balance for first fiscal year	30,000.00
TOTAL	$ 130,000.00

Chapter:

1. Salaries, allowances, etc. (3)		58,000.00
2. Travel		10,000.00
3. Expenses - Meetings		15,000.00
4. Publications		5,000.00
5. Office equipment		1,500.00
6. General operating expenses		8,000.00
7. Miscellaneous expenses		2,500.00
8. Special and extraordinary projects:		
a) Tagging	$ 10,000.00	
b) Statistics	10,000.00	
c) Computer programming	10,000.00	
		30,000.00

Remarks:

(1) Approved at the First Meeting of the Commission (Rome, December 1-6, 1969).
(2) Readjustments to the budget, agreed upon at the First Regular Meeting of the Council (Madrid, November 16-20, 1970).
(3) *Salaries, allowances, etc.*

a) Executive Secretary	$ 18,375.00	
b) Asst. Exec. Secretary	15,618.00	
c) Administrative Asst.	6,513.00	
d) Clerk-steno	4,885.00	
e) Miscellaneous expenses	4,200.00	$ 49,591.00
Additional help		
f) Messenger	1,800.00	
g) Translators and others	6,609.00	8,409.00
		$ 58,000.00

The sum of $ 4,200.00 has been included under Miscellaneous expenses (e) in event there is a salary increase during 1971.

Annex 9

List of Documents presented to the Council and to the Standing Committee on Research and Statistics

	DOCUMENT
First Regular Meeting of the Council - Provisional Agenda (E-F-S)	ICCAT/CON/70/1 (Rev.) 5/X/1970
Standing Committee on Research and Statistics (SCRS) - Provisional Agenda (E-F-S)	ICCAT/CON/70/2 15/VIII/1970
Commission Officers (E-F-S)	ICCAT/CON/70/3
Draft Agreement between the Spanish Government and the International Commission for the Conservation of Atlantic Tunas - *For Delegates only* (E-F-S)	ICCAT/CON/70/4 15/VIII/1970 (amended copy)
Provisional Agenda for ICCAT Stock Assessment Subcommittee Meeting (E)	ICCAT/CON/70/5
Proposal for a Scheme of Joint International Enforcement of the Fishery Regulations in the Convention Area (ICNAF) (E)	ICCAT/CON/70/6 20/IX/1970
Scheme of Joint Enforcement North East Atlantic Fisheries Commission (NEAFC) (E-F-S)	ICCAT/CON/70/7 20/IX/1970
Summary of the Tuna Research Activities in Japan for 1969 (E)	ICCAT/CON/70/8 20/IX/1970
Progress of Japanese Tuna Fisheries in the Atlantic Ocean (E)	ICCAT/CON/70/9 20/IX/1970
Canadian Research Report, 1969-70 (E-F-S)	ICCAT/CON/70/10 20/IX/1970
August-September: A New Tuna Fishing Season in the Ivory Coast area (F)	ICCAT/CON/70/11 20/IX/1970
Notes for the Completion of Form STATLANT 11A and 11B «Atlantic Tuna Fisheries: Catch Summary» (E)	ICCAT/CON/70/12 20/IX/1970

E = in English; F = in French; S = in Spanish.

	DOCUMENT
Larval Distribution of Tunas and Billfishes in the Atlantic Ocean (E)	ICCAT/CON/70/13 20/IX/1970
Experiments on Live Bait Tuna Fishery and Tagging (F)	ICCAT/CON/70/14 20/IX/1970
Review of South African Tuna Fisheries and Research (E-F-S)	ICCAT/CON/70/15 20/IX/1970
Research Report (France) (E-F-S)	ICCAT/CON/70/16 20/IX/1970
Panel Membership (E-F-S)	ICCAT/CON/70/17 28/IX/1970
Proposed Divisions of the Atlantic Ocean for Tuna Statistics (E)	ICCAT/CON/70/18 1/X/1970
Report of the First Special Meeting of the Council (E-F-S)	ICCAT/CON/70/19 8/X/1970
Main Characteristics Studied in Tunas in the Gulf of Cádiz, Caught by Spanish Traps (E-F-S)	ICCAT/CON/70/20 13/X/1970
Administrative Report 1970 (E-F-S)	ICCAT/CON/70/21 15/X/1970
Financial Report (E-F-S)	ICCAT/CON/70/22
Bulletin of Fishery Statistics - FAO (E-F-S)	ICCAT/CON/70/23 24/X/1970
Tuna Fisheries in the Canaries and Africa (S)	ICCAT/CON/70/24 24/X/1970
French Tuna Fleet (Atlantic) (F)	ICCAT/CON/70/25 24/X/1970
Preliminary Effort and Catch Estimates for Atlantic Longline Fisheries 1956-68 (E)	ICCAT/CON/70/26 26/X/1970
List of Documents (E-F-S)	ICCAT/CON/70/27
Relationship ICCAT/FAO (E-F-S)	ICCAT/CON/70/28
58th Statutory Meeting of the International Council for the Exploration of the Sea (F)	ICCAT/CON/70/29

	DOCUMENT
The Inter-American Tropical Tuna Commission (IATTC) (E-F-S)	ICCAT/CON/70/30 31/X/1970
Notes on Albacore Fishery (F)	ICCAT/CON/70/30 bis 2/XI/1970
Status of Albacore *(Thunnus alalunga)* Stocks in the Gulf of Biscay (F)	ICCAT/CON/70/31 2/XI/1970
Preliminary Results on Growth of Albacore in the Gulf of Biscay (F)	ICCAT/CON/70/32 2/XI/1970
I.S.T.P.M. work on Albacore *(Thunnus alalunga)* (F)	ICCAT/CON/70/33 3/XI/1970
Taiwan's Tuna Fisheries and Tuna Fishery Research 1970 (E-F-S)	ICCAT/CON/70/34 3/XI/1970
Report of the First Session of the IOFC Committee on Management of Indian Ocean Tuna (E-F)	ICCAT/CON/70/35 3/XI/1970
Tuna Longline Fishing in Korea (E-F-S)	ICCAT/CON/70/36 9/XI/1970
United States Research Report to the First Regular Meeting of the ICCAT Council, 1970 (E-F-S)	ICCAT/CON/70/37 9/XI/1970
Exploitation and Management of Tuna Resources in the Eastern Pacific Ocean (E)	ICCAT/CON/70/38 10/XI/1970
Report of the Standing Committee on Research and Statistics (E-F-S)	ICCAT/CON/70/39 13/XI/1970
Overseas Office for Scientific and Technical Research (ORSTOM) (F-S)	ICCAT/CON/70/40 18/XI/1970
Common Study of the Mediterranean (COI - CGPM - CIESM) (E-F-S)	ICCAT/CON/70/41 18/XI/1970
Long-Term Changes in Abundance of Yellowfin and Skipjack off the Coast of Angola — Campos Rosado (E)	Unnumbered - Distributed after the meeting.

REPORT OF THE STANDING COMMITTEE ON RESEARCH AND STATISTICS

ICCAT/CON/70/39
November 13, 1970

TABLE OF CONTENTS

1. Introduction

The Committee met in the Casa Sindical, Madrid, under the Chairmanship of Mr. V. Valdez from 9-13 November. Delegates from Canada, France, Japan, Korea, Portugal, Spain, USA and FAO, and observers from IATTC, ICES and CWP were present. After a welcome from the Chairman, the Agenda as set out in Annex 1 was adopted.

2. Review of national fisheries

The progress and likely future development of national tuna fisheries in the Atlantic were reported to the Committee. These are set out in the various national reports, and some of the more important developments are discussed in detail in the report of the Sub-Committee on Stock Assessment. The information is therefore summarized very briefly here.

Brazil. No report was received.

Canada (details in Document no. 10) has an important swordfish fishery in the northwest Atlantic, which catches a few tunas incidentally. Canada also operates a few large purse seiners in the tropical Atlantic. No appreciable changes are expected in the near future.

France (Document no. 30 bis) has two major tuna fisheries. In the Bay of Biscay albacore are caught by a seasonal fleet of baitboats and trollers. The present trend is for the effort to decrease. Because catch rates have fallen, more vessels have remained trawling throughout the year. In the eastern central Atlantic tropical tunas (principally yellowfin) are caught by a mixed fleet of baitboats, and purse seiners based at West African ports. In the near future there is not likely to be much change in the number of smaller vessels, but a few large purse seiners are likely to join the fleet.

Ghana. No report was received, and it appears that the main concern is the transshipment of tuna caught by flag vessels of other countries.

Japan. (Document no. 8). The major longline fisheries in the Atlantic were developed by Japanese vessels. Operation started in 1957 and reached a peak in 1965. Recent trends have been a reduction in catch and effort, a dispersion to higher latitudes, and a change in species composition. A fishery in the tropical Atlantic (since 1962) and purse seiners (since 1964) catching skipjack and yellowfin has been developed. Operations by Japanese vessels are controlled by Government license, and no sharp increase is expected in the immediate future.

Korea. (Document no. 36). Korean longliners started operations in the Atlantic in 1964, and the fishing effort and catches have increased steadily since. The present plan is, within the next 5 years, to increase the total longline catches in the Pacific, Indian and Atlantic oceans to double the present level, and also to introduce purse seiners and baitboats. A 1,000 gross ton research vessel will also be completed and operated.

Morocco. No report was received, but it appears that an expansion of tuna fishery is planned.

Portugal. No report was received from metropolitan Portugal. The tuna fisheries of Angola consist of a trap fishery for little tuna and other species, and a baitboat fishery, mainly for yellowfin and skipjack. It is likely that there may be some expansion of baitboat fishery, and three new purse seiners are also expected to start operations.

South Africa. (Document no. 15). South Africa has no significant tuna fishery at present, a fishery for albacore having declined for economic reasons.

Spain. (Documents nos. 20 and 24) has a variety of fisheries around the Iberian Peninsula, the Canary Islands and off the West African coast, using traps, live bait, etc. It is likely that there will be an increase of long-range freezing operations in the future.

U.S.A. (Document no. 37). Until 1961 the main U. S. fishery was a trap fishery, mostly for bluefin, along the U. S. east coast, together with some exploratory fishing by purse seiners and baitboats in the eastern Atlantic. A small purse seine fishery for bluefin and in some years for skipjack then developed off the U. S. east coast. In 1967 a few large purse seiners started operations in the tropical Atlantic, mainly for yellowfin. This fishery expanded rapidly. It is likely that there will be some further increase in the number of large purse seiners operating in the Atlantic.

Other countries. An informal report was received on fisheries of Taiwan (Document no. 34). The number of longline vessels operating in the Atlantic has increased rapidly since 1967. The USSR reported a small tuna catch in the Atlantic, but details of species and gear are not known. The best estimates of total catches of tunas and tuna-like fishes in the Atlantic by countries, by species and by gear for 1968 are attached as Annex 2.

3. Review of national research programs

Countries described their national research programs, as set out in the various documents (8, 10, 15, 16, 20, 24, 32, 33 and 34). Most of the activities concerned the collection of basic statistical data, biological sampling, age-determination and growth studies, and tagging. They are described in more detail in other sections of this report.

It was pointed out that confusion had arisen because of the uncertainty concerning the names, especially local names, used to describe the different species. It was agreed that the Commission should prepare a checklist of tuna species, giving the scientific name, the preferred name in each of the Commission languages, and local names. This list should be prepared with reference to other lists, in view of the importance of tuna in international trade. Preparation of such a definitive list would require time and work by correspondence, but a small group was asked to prepare a first draft during the present session (Annex 3).

4. Sampling

The Committee noted the recommendation of the Sub-Committee on Stock Assessment concerning the need to improve several aspects of the sampling program. Adequate sampling is essential for the Commission work, and it was therefore desirable that an ad-hoc working group should be set up to ensure adequate sampling of the catch of tunas and tuna-like fishes taken in the Atlantic in order to provide the necessary size-composition information for stock assessment work. Following the recommendations made by its working group, the following terms of reference for further work by the Standing Committee on Research and Statistics were adopted:

1. In association with the Sub-Committee on Stock Assessment, establish requirements for sampling the catch in terms of:

   a) Species
   b) Countries
   c) Gear
   d) Time
   e) Area, or any other relevant category.

2. Develop guidelines, based on the recommendations of the Working Group on Tuna Length Measurements and Tabulation included in the report of the third session of FAO, Expert Panel for the Facilitation of Tuna Research (FRm/R80) as to the techniques and methods of sampling.

3. To provide guidelines for sampling design, including such things as optimum size and numbers of samples for each level of catch to be taken within strata listed on (1) above.

4. To ensure that the recommended sampling program be designed so as to provide the necessary framework within which the various countries can carry out their own respective sampling programs.

5. To examine the type of data submitted by countries and the methods of reporting, compiling and disseminating them, including the establishment of a data depositary center at the headquarters of ICCAT.

Having established the sampling program within the guidelines recommended above, it should be the continuing responsibility of the Standing Committee on Research and Statistics to keep the progress of this sampling program under review.

5. Stock assessment

The Committee received the report of the Sub-Committee on Stock Assessment. It approved this report, as set out in Annex 4, and congratulated the Convenor and the Sub-Committee on their work. The list of recommendations given in section 6 was endorsed. In relation to recommendations in 6 it was noted that Korea and Taiwan had set up detailed schemes of log-book records, and for Korea, measurement schemes, and that these data could be available at future meetings. The work of this Sub-Committee which is central to the work of the Commission, should continue. There was some discussion concerning the timing of its next meeting, bearing in mind the need to reduce travelling expenses, and the desirability on the one hand to have an up-to-date report, and on the other for the delegates to the Commission to have time to consider the report in detail. It was agreed that the next meeting of the Sub-Committee should be immediately before the next meeting of the Standing Committee on Research and Statistics.

It was pointed out that the task of the Sub-Committee would be lightened if more preparatory work could be done in advance of the meeting. This should include the interchange of data and the results of analysis between members of the Sub-Committee. The Secretariat is requested to arrange for the compilation and tabulation of the statistics and length-composition data in the most convenient form for stock assessment.

6. Tagging

Several countries (Canada, France, Spain and the U.S.) reported on tagging work. The most interesting results have been the demostration of the movement of bluefin in both directions across the Atlantic. The Committee noted the recommendations of the Sub-Committee on Stock Assessment concerning the need to determine the separation of stocks of yellowfin and albacore for which tagging would be most useful.

There was some discussion of the problems of tuna tagging. There is a high mortality at the time of tagging for all tunas. Experience in other oceans shows that longline caught fish are unsuitable for tagging, and that the survival of purse seine caught fish is on the average only about half that of those caught by baitboat.

Except possibly for bluefin, present tagging programs are inadequate for direct estimation of fishing mortality. For the immediate future, therefore, the tagging work should be considered as a part of an integrated program concerned with stock separation. It was suggested that a Sub-Committee should be set up to consider this subject, including possible action within the Commission to increase the effectiveness of national tagging programs.

An ad-hoc group was appointed to formulate terms of reference for a Sub-Committe on Subpopulation Identification to be established by the Standing Committee on Research and Statistics. The Standing Committee believes that the initial work of the Sub-Committee should emphasize tagging studies and in addition coordinate the work presently being done on biochemical, morphometric and parasite techniques to further the solution of stock identification problems. The terms of reference for the Sub-Committee are:

1. Facilitate the development of tagging programs for tunas and tuna-like fishes in the Atlantic Ocean, and actively assist in arrangements for international collaboration in carrying out these programs.

2. In association with the Sub-Committee on Stock Assessment, recommend priorities for tagging the different species of tunas and tuna-like fishes in the Atlantic.

3. Recommend tagging methods and procedures for use on tunas and tuna-like fishes in the Atlantic. Recommendations should include kinds of tags, methods of application, design of tagging experiments for measuring dispersion, mortality, and efficiency of different kinds of tags, and publicity and reward systems for recovery.

4. Record and follow-up any tagging program being carried out or planned, and inform the Executive Secretary of the Commission who in turn could give it wide distribution.

5. Facilitate the development of stock identification programs using biochemical, morphometric, and parasite techniques and assist in arrangements for international collaboration in carrying out these programs.

6. Exchange information on stock identification studies of tunas and tuna-like fishes with other international organizations concerned with these studies.

7. Other research matters

There was some discussion of studies of the environment (surface temperatures) and its relation to tuna. It was agreed that such studies were likely to be an integral part of any national program of tuna research. Countries were urged to report the results of such research to the Committee. As appropriate the Commission might encourage national programs of environmental research, and in this regard the attention of the Committe was drawn to the Cooperative Investigation of the Northern part of the Eastern Central Atlantic (CINECA) being organized by ICES with the cooperation of IOC and FAO.

For the main purposes of the Commission the most important result of environmental research was likely to be the explanation of anomalies in observed catch rates. These seemed to be more important in the surface fisheries, rather than the longline fisheries, and initially studies might be concentrated in the area of the former. It was pointed out that there exist regular compilations of data of sea sur-

face temperature, expressed as temperature, or anomalies from a long-term mean. It was suggested that the Convenor of the Sub-Committee on Stock Assessment should arrange for these data to be made available to the Sub-Committee for analysis, and compare with data on distribution of catches.

Information on larval distribution was presented (Document no. 13). Such information can be useful in studying the distribution and, to some extent, relative abundance of adult fish, especially those not yet heavily exploited. However, there are still some important problems concerning the identification of larval tunas. It was noted that the problem of identification is receiving attention from a Working Group of the FAO Expert Panel for the Facilitation of Tuna Research. It was agreed that this Group should be asked to intensify its work.

The Committee noted the difficulties encountered by the Sub-Committee on Stock Assessment concerning uncertainties in age-determination and the recommendation from these analyses.

8. Relations with other bodies

The Committee received the report of the ICCAT observers to ICES and comments from the Executive Secretary, the representative of FAO, and observers from ICES and IATTC. The value of close scientific cooperation between the various bodies was emphasized, but it was noted that details of any formal agreement, if such were necessary, would be settled by the Council or Commission.

Specific examples of cooperation were noted in other sections of the report dealing with sampling and larval identification. Regarding tagging it was noted that a Working Group of the Expert Panel for the Facilitation of Tuna Research has been active in interchanging information concerning tuna tagging in the Atlantic, but that this work might now be taken over by the Sub-Committee on Subpopulation Identification.

The Director of Investigations of the IATTC issued an invitation to the Executive Secretary of ICCAT and the Chairman of the Standing Committee on Research and Statistics to visit the IATTC headquarters to study the operation of that Commission in detail.

9. Advice to Panels

It was agreed that, subject to the agreement of the Panels, scientific advice could be supplied directly to the Panels by the Standing Committee on Research and Statistics without the need to set up special groups of scientific advisors to each Panel.

It was expected that in the future the Committee would have before it specific questions set by the Panels. In relation to the work of the Panels, the attention

of the Council was drawn to the Report of the Sub-Committee on Stock Assessment (Annex 4).

10. Statistics

Accurate, reliable, comprehensive and up-to-date statistics are essential for the Commission's work. The Committee emphasized strongly that it was the responsibility of the Commission and its Secretariat to ensure that adequate statistics were available. If they fell short of the required standard, the Secretariat, with the help and advice of the Standing Committee on Research and Statistics, should take active steps to ensure their improvement.

There was some discussion concerning the closeness with which the Commission should be involved with the actual collection of statistics. The essential choice was whether the information should flow directly from the fishing vessel to the Commission (as is generally the case with IATTC), or whether data should be passed to the Commission through national statistics offices (as is the case with ICNAF). It was agreed that reporting would, for the present, have to be done through national offices.

To clarify the precise data which should be requested by the Secretariat from national offices, a small Working Group met and drew up the following lists of tasks. These are separated into Step I, when there is no regulation of fisheries, and Step II, following the introduction of regulations at which time, depending on the nature of the regulation, more detailed and current data might be required.

Step I: No regulation of fisheries

Task I Commission Secretariat to assemble from countries an accepted tabulation for all preceding years up to and including 1969 of the following:

a) Total catch on live weight basis in metric tons,

(i) by species (including all tunas and tuna-like fishes as defined by the ICCAT Convention, with special emphasis on yellowfin, albacore, bluefin, bigeye and skipjack),

(ii) by flag vessels, recognizing the fact that there will be some exceptional cases which should be examined and as far as possible resolved by the Secretariat,

(iii) by gear, e.g., longliners, purse seiners, baitboats, traps, trollers, other methods and sport gears.

b) Total number of vessels of the following categories:

(i) by type of vessel as follows:
1) Deck-loaded-type mother-boat longliners;
2) Self-operating mother-boat longliners;

3) Individual homeland-based longliners,
4) Individual foreign-based longliners,
5) Single-boat purse seiners,
6) Double-boat purse seiners,
7) Purse seiners using bait,
8) Baitboats with freezer,
9) Baitboats with iced well,
10) Trollers,
11) Others,
12) Sport fisheries.

(ii) by size-classes as follows:

Type of boat	*Unit*	*Classes*
Longliners	Gross register tons	0-50, 51-200, 201-500, 501-1000, 1001 or above *
1-boat purse seiners	Carrying capacity in metric tons	0-50, 51-100, 101-200, 201-300, 301-400, 401 and above (which may be further broken down)
2-boat purse seiners	Gross register tons	0-50, 51-150, 151 and above
Baitboats carrying ice	Gross register tons	0-50, 51-150, 151 and above
Freezer baitboats	Carrying capacity in metric tons	0-50, 51-150, 151 and above
Trollers	Gross register tons	0-50, 51-150, 151 and above
Others		No size classes
Sport fisheries		No size classes

(iii) by flag.

Task 2 Commission Secretariat to encourage countries to submit for all preceding years up to and including 1969, details on the following:

a) Catch, with corresponding amount of effort in live weight and in metric tons, except for longline fisheries, for which number of fish may be used (Secretariat is encouraged to supplement these with live weight data).

b) Effort data in the following units:
(i) longliners: number of hooks used,

* Subdivision subject to revision by correspondence between major longline countries.

(ii) purse seiners, baitboats, trollers, and traps: in number of fishing days (including scouting days) or in certain fishery where such data are not appropriate, in number of days absent from the port (or days out at sea).

These catch and effort data should be broken down as much as possible into 1° × 1° areas, or for longliners into 5° × 5° areas, by month of catch, by species and by gears, which are indicated in Task 1.

Task 3 To place all above on a continuing and annual basis.

Step II: Some regulation of fisheries

Task 4 Initiate short-delay reporting system for those species whose fisheries are to be regulated.

The reporting of the past data might be done on an ad-hoc basis. For reporting of current data it would probably be helpful both to the Commission and to member countries if forms were comparable with the common pattern (STATLANT) adopted by CWP for North Atlantic statistics.

There were a number of questions of detail concerning the definitions and concepts involved in reporting statistics. One major problem concerned that of the nationality, and the national responsibility, for reporting statistics, of vessels operating under charter. The Secretariat was asked to investigate this problem in detail. This problem, and others of definition, e.g., the convertion of landed weight to live weight, are common to several Commissions, and it would therefore be desirable for the Commission to become associated with Coordinating Working Party for Atlantic Fisheries (CWP) in which ICES, ICNAF and FAO discuss these common problems at the technical level. The Committee therefore recommends to the Council that the Commission should be represented at the next meeting of CWP.

In discussion of suggestions of the Working Group, and of the draft notes for completion of statistical forms prepared by the Secretary of CWP (Document no. 12) the following proposals were agreed to:

a) Statistics should include catches of sports fishermen, since the Commission needed data on the total removals from the stock.
b) Statistics should also include as a separate item, discards.
c) As statistical data were received by the ICCAT Secretariat, copies should be circulated to member countries to have up-to-date information.

11. Publications

At its meeting during the first session of the Commission in 1969 the Committee had suggested four possible series of publications.

a) A Statistical Bulletin.
b) The report of the Standing Committee on Research and Statistics.

c) A general report of the activities of the Commission.
d) Ad-hoc publications, e.g., a symposium.

It was agreed that the Statistical Bulletin was essential. Because of the complexity of some of the detailed data it was difficult to determine a precise format. It should contain all the information resulting from Task 1 outlined above, and as much of that from Task 2 as could be conveniently included, possibly in chart form. The Secretariat was asked to prepare a Bulletin along these lines, which should be about the size of the ICNAF or ICES Bulletin.

It was emphasized that the Statistical Bulletin should be published as quickly as possible, but since it should contain the definitive statistics there might be some delay until the final data were available from all countries. In the meantime it is important for interim and perhaps slightly imprecise statistics to be made available, in a less formal publication, to interested scientists.

It was also agreed that the report of the Committee, and its Sub-Committee should be published, following the pattern of the ICNAF Redbook. The need for ad-hoc publications had not yet arisen, and the question of a general Commission report should be decided by the Council.

12. Sub-Committees

It was agreed that in addition to the Sub-Committees already discussed, a Sub-Committee should be set up to review in detail the progress of the Commission's statistical work. For the present this Sub-Committee should include in its terms of reference the review of the Commission's sampling program as set out in section 4 and the arrangement of work of Sub-Committees should be reviewed by the Committee at its 1971 session.

The following convenors were elected:

Sub-Committee on Stock Assessment:	J. C. LE GUEN
Sub-Committee on Subpopulation Identification:	A. C. JONES
Sub-Committee on Statistics:	S. HAYASI

These officers would serve for a period of one year.

13. Date and place of next meeting

The Standing Committee on Research and Statistics should meet during the week immediately preceding the next Commission meeting, and at the same place. The Sub-Committee on Statistics could meet during the same week, but the Sub-Committees on Stock Assessment and Subpopulation Identification should meet, possibly concurrently, during the week preceding the Standing Committee on Research and Statistics meeting.

14. Other matters

The attention of the Committee was drawn to the report of the First Meeting of the Commission, in which it was stated that the possible appointment of a full-time stock assessment expert to the Commission's staff should be kept under review. Some delegations felt that such an appointment was highly desirable, especially from the point of view of small countries unable to provide stock assessment expertise of their own. The delegate of Japan doubted the desirability of such an appointment in view of the professional competence of the members of the Sub-Committee on Stock Assessment. Any decision on this subject was a matter for the Council or Commission.

The Committee also noted that because of late appointment of staff, the Commission was likely to have more uncommitted funds than expected during the present financial year. It recommended to the Council the desirability of using this money for assisting the work of the Committee, and especially for increasing the effectiveness of the Sub-Committee on Stock Assessment. Precise details might be settled by the Secretariat in consultation with the Chairman of the Standing Committee on Research and Statistics, and the Convenor of the Sub-Committee on Stock Assessment, but the following suggestions were made:

a) Compilation of catch, effort and sampling data, and their presentation in the most suitable form for stock assessment studies.
b) Putting suitable computer programs concerned with stock assessment on a computer in Madrid so that they would be immediately available for the Sub-Committee on Stock Assessment during its work. For example, several studies were suggested during the past meeting which could have been quickly made on a computer, but in fact will not now be carried out for some weeks.
c) Hiring a stock assessment expert for a period to prepare a draft report on the state of the stocks for critical review by the Sub-Committee on Stock Assessment. Such a draft might enable the Sub-Committee to submit a more carefully revised and clearly written report to the Committee. This suggestion might, however, be subject to the same consideration as the appointment of a full-time stock assessment expert.

Annexes:

1 — Agenda
2 — Catch statistics
3 — Proposed names of species
4 — Report of Sub-Committee on Stock Assessment

Annex 1

Agenda for Standing Committee on Research and Statistics
November 9-14, 1970

1. Review of tuna fisheries state of development in each country.
2. Review of national research on tuna.
3. Statistics.
   3.1 - Review of 1968 and 1969 tuna statistics.
   3.2 - Procedures and forms for reporting statistics.
   3.3 - Possible establishment of statistics sub-committee.
4. Review of sampling programs.
5. Report on stock assessment.
6. Tagging.
   6.1 - Planning of future tagging work.
   6.2 - Distribution and information on tagging and tag recoveries.
7. Environment.
8. Presentation of papers and other research results not covered by other items of the Agenda.
9. Scientific advice to Panels.
10. Relationship with other scientific institutions: ICES, FAO, I-ATTC, CIPEC, CICAF, ICSEAF, CARPAS, ICNAF, NEAFC, etc.
11. Publication, Standing Committee on Research and Statistics.
12. Proposed sub-committees and designation of convenors.
13. Date and place of next SCRS Meeting.
14. Discussion and adoption of the SCRS Report.

Estimated catch of tunas and tuna-like fishes (in 1000 metric tons)

COUNTRY	TOTAL	YELLOWFIN				BIGEYE			ALBACORE			
		Total	Longliners	Baitboats	Purse seiners	Total	Longliners	Baitboats	Total	Longliners	Baitboats	Trollers
Algeria	0.2	.	.	.	.	.	.	.	.	.	.	.
Angola [1]	9.0	1.1	.	1.1	.	.	.	.	.	.	.	.
Argentina	3.5	0.2	0.2	.	.	0.4	0.4	.	1.3	1.3	.	.
Brazil	7.5	.	.	.	.	0.7	0.7	.	.	.	.	.
Canada [1]	7.8	0.4	.	.	0.4	.	.	.	.	.	.	.
China (Taiwan) [2]	22.0	6.5	6.5	.	.	4.6	4.6	.	8.7	8.7	.	.
Colombia	0.4	.	.	.	.	.	.	.	.	.	.	.
Cuba	8.4	1.9	1.9	.	.	0.9	0.9	.	.	.	.	.
France [1, 3]	55.5	26.5	.	13.2	13.3	2.5	1.2	1.3	14.3	.	2.8	11.5
Ghana	7.5	.	.	.	.	.	.	.	.	.	.	.
Greece [1]	2.4	.	.	.	.	.	.	.	.	.	.	.
Italy [4]	6.8	.	.	.	.	.	.	.	.	.	.	.
Japan [1]	72.6	21.4	12.1	2.2	7.1	10.9	10.9	.	15.2	15.2	.	.
Korea [2]	12.7	2.0	2.0	.	.	0.2	0.2	.	7.3	7.3	.	.
Liberia	5.0	.	.	.	.	.	.	.	.	.	.	.
Libya	1.5	.	.	.	.	.	.	.	.	.	.	.
Mexico	6.5	.	.	.	.	.	.	.	.	.	.	.
Morocco	15.7	.	.	.	.	.	.	.	.	.	.	.
Norway	0.9	.	.	.	.	.	.	.	.	.	.	.
Portugal	11.1	.	.	.	.	2.0	.	.	6.3	.	6.3	.
Senegal	12.2	2.1	.	1.0	1.1	.	.	.	9.1	.	9.1	.
Spain [1]	70.3	0.9	.	.	0.9	.	.	.	23.6	.	15.8	7.7
Trinidad, Tobago	4.0	.	.	.	.	.	.	.	.	.	.	.
Turkey [5]	21.7	.	.	.	.	.	.	.	.	.	.	.
USSR	4.7	.	.	.	.	.	.	.	.	.	.	.
USA [1, 6]	10.4	6.2	.	.	6.2	.	.	.	.	.	.	.
Venezuela	6.0	1.2	1.2	.	.	.	.	.	0.6	0.6	.	.
TOTAL	386.3	70.4	23.9	17.6	29.0	22.2	18.9	1.3	86.4	33.1	34.0	19.2

1. Live weight.
2. Probably underestimated because some dressed weight is included.
3. Excluding Mediterranean catches.
4. Catches in the Mediterranean Sea.

Annex 2

in the Atlantic, by countries, by species and by gears for 1968

BLUEFIN					SKIPJACK					BONITO & OTHERS						BILLFISHES	
Total	Longliners	Baitboats	Purse seiners	Traps	Total	Longliners	Baitboats	Purse seiners	Trollers	Total	Longliners	Baitboats	Purse seiners	Trollers	Traps	Total	Longliners
.	.	.	.	.	.	.	.	.	.	0.2	.	.	.	.	.	.	.
.	.	.	.	.	4.2	.	4.2	.	.	3.8	.	.	.	.	3.8	.	.
.	.	.	.	.	.	.	.	.	.	1.3	.	.	.	.	.	0.3	0.3
.	.	.	.	.	1.5	.	.	.	1.5	5.1	.	.	.	5.1	.	0.2	.
2.0[7]	.	.	.	.	1.0	.	.	1.0	.	.	.	.	.	.	.	4.4	4.4
0.1	0.1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1.8	1.8
.	.	.	.	.	.	.	.	.	.	0.4	.	.	.	.	.	.	.
1.2	1.2	.	.	.	.	.	.	.	.	3.0	.	3.0	.	.	.	1.4	1.4
0.8	.	0.8	.	.	10.4	.	5.2	5.2	.	1.0	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	.	7.5	.	.	.	.	.	.	.
0.5	.	.	.	0.5	.	.	.	.	.	1.9	.	.	.	.	.	.	.
3.3	.	.	.	3.3	.	.	.	.	.	2.1	.	.	.	.	2.1	1.4	.
0.4	0.4	.	.	.	12.9	0.7	6.7	5.6	.	7.7	1.0	2.4	4.3	.	.	4.1	4.1
.	.	.	.	.	.	.	.	.	.	3.2	3.2	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	.	5.0 (Atl. little tuna-canoe-fishing)						.	.
1.0	.	.	.	1.0	.	.	.	.	.	.	.	.	.	.	.	0.5	.
.	.	.	.	.	.	.	.	.	.	6.5	.	.	.	6.5	.	.	.
1.1	.	.	.	.	0.3	.	.	.	.	14.0	.	.	.	.	.	0.3	0.3
0.7	.	.	0.7	.	.	.	.	.	.	.	.	.	.	.	.	0.2	.
0.2	.	.	.	.	.	.	.	.	.	2.6	.	2.6	.	.	.	(Mostly bait boat)	
0.3	.	0.2	0.1	.	0.8	.	0.4	0.4	.	.	.	.	.	.	.	.	.
6.6	.	.	.	1.1	0.5	.	.	.	.	34.9 (Bonito=2.6)				.	.	3.8	3.8
.	.	.	.	.	.	.	.	.	.	4.0	.	.	.	.	.	(Canoe - fishing)	
0.3	.	.	.	0.3	.	.	.	.	.	21.4	.	.	.	.	14.3	.	.
.	.	.	.	.	.	.	.	.	.	4.5	4.5	.	.	.	.	.	.
0.6	.	.	0.6	.	3.2	.	.	3.2	.	.	.	.	.	.	.	0.4	0.4
.	.	.	.	.	.	.	.	.	.	3.9	3.9	.	.	.	.	0.3	0.3
19.1	1.7	1.0	1.4	6.2	34.8	0.7	16.5	15.4	1.5	134.0	.	.	.	.	.	19.1	.

5. Including catches in the Black Sea.
6. Considerable catches of tuna and billfishes by sports fishermen not included.
7. Provisional. Probably too high.

Annex 3

Proposed names of species for ICCAT use

Scientific names	*Scientific synonyms*	*English names*	*French names*	*Spanish names*
Thunnus thynnus	*(Thunnus thynnus thynnus)*	Bluefin tuna (Tunny)	Thon rouge	Atún
Thunnus maccoyii	*(Thunnus thynnus maccoyii)*	Southern bluefin tuna	Thon rouge du sud	Atún del sur
Thunnus albacares	*(Neothunnus macropterus)*	Yellowfin tuna	Albacore (Thon à nageoires jaunes)	Rabil
Thunnus alalunga	*(Germo alalunga)*	Albacore (Longfin white tuna)	Germon (Thon blanc)	Atún blanco (Albacora)
Thunnus obesus	*(Parathunnus obesus)*	Bigeye tuna	Thon obése (Patudo)	Patudo
Thunnus atlanticus		Blackfin tuna		
Euthynnus alletteratus		Atlantic little tuna	Thonine (de l'Atlantique)	Bacoreta (del Atlántico)
Katsuwonus pelamis	*(Euthynnus pelamis)*	Oceanic skipjack (Striped tuna)	Bonite à ventre rayé (Listao)	Listado

Sarda sarda		Atlantic bonito (Belted pelamid)	Bonite à dos rayé	Bonito
Auxis thazard	*(Auxis rochei)*	Frigate mackerel (Bullet mackerel)	Auxide	Melva
Acanthocybium solandri		Wahoo (Peto)	Thazard batard	Peto
Scomberomorus maculatus		Spotted Spanish mackerel	Macquereau espagnol	Carita
Scomberomorus cavalla		King mackerel	Thazard	Carita
Scomberomorus regalis		King mackerel	Thazard	Carita
Istiophorus albicans	*(Istiophorus americanus)*	Atlantic sailfish (American sailfish)	Voilier (de l'Atlantique)	Pez vela
Makaira indica		Black marlin	Makaire noir	Aguja negra
Makaira nigricans	*(Makaira ampla)*	Atlantic blue marlin	Makaire bleu	Aguja azul
Tetrapturus albidus	*(Makaira albida)*	Atlantic white marlin	Makaire blanc	Aguja blanca
Xiphias gladius		Broadbill swordfish	Espadon	Pez espada

Annex 4

Report of Sub-Committee on Stock Assessment Madrid, 1970

1. INTRODUCTION

The Sub-Committee on Stock Assessment met at ICCAT headquarters in Madrid from 2-6 November, 1970, convened by J. P. Wise (USA). The Agenda was based on that of the 1968 Miami meeting on Atlantic tuna stocks (FAO-R61) with the agreed addition during the meeting of an item concerning billfishes; the agreed agenda is attached as Annex 5.

The following specific accounts report the sense of the discussions of the group, supported by the contents of several of the working papers tabled (for lists of these see Annex 6).

2. YELLOWFIN

2.1. The fisheries

The principal feature of the recent fisheries for Atlantic yellowfin, recent statistics for which are summarized in Table 1, has been the rise in the catches by large purse seiners, mainly from the U.S., but several other countries have such vessels in operation or under construction. At the same time the surface fisheries along the West African coast by European and African vessels using smaller purse seiners, and live bait fishing have been maintained. A decline in the activity by Japanese longliners has been in part offset by increases in the longline fisheries of Korea and Taiwan. The catches in 1968 (70,000 tons) were slightly higher than the previous year (1964 - 68,000 tons), though the proportion caught by longlines was only 34 %, compared with 61 % in 1964. Preliminary figures suggest that total catches in 1969 were rather above 1968. It may be noted that Table 1 (and also Table 4 for albacore) includes all statistics available to the Sub-Committee, but it is believed that some other countries (e.g. USSR) have engaged in some tuna fishing in the Atlantic.

The large purse seiners, unlike the other surface fisheries, catch a wide range of sizes of fish, including many as large as those caught in the longline fisheries. The detailed size-composition of the major fisheries, grouped according to pre-

sumed age-groups, are set out in Table 2. Because of the wide overlap in sizes taken, it is not longer possible to carry out the analysis in terms of two largely independent fisheries (surface and longline) as was done in the report of the 1968 Miami meeting.

2.2. *Biological studies*

Information on the growth rate was briefly reviewed. Up to almost 4 years old there is good agreement, but for the older fish the methods used (scale reading and examination of modal lengths), become difficult to apply and, as indicated by the brackets in Table 2, allocation of fish to the older age groups may be uncertain. Further critical studies of age-determination and growth rate are required.

Evidence regarding migrations and stock separation was examined. This information and by analogy with the rather more extensive data from the eastern Pacific, suggests that the Atlantic yellowfin may be divided into a number of more or less independent groups, the nature of which is not fully understood. This would complicate the study of the effect of fishing on these groups. More studies are needed, and tagging would be particularly useful.

2.3. *Stock assessment*

The available measures of stock abundance, as given by the catches per unit effort on various fisheries are summarized in Table 3. Taken together these suggest a clear downward trend, though no one index provides a satisfactory measure of more than a small section of the stock.

The longest series of data comes from Angola, which is on the extreme southern fringe of the yellowfin distribution. The marked decline in yellowfin catches started there in the mid-nineteen fifties, before the development of the major yellowfin fisheries, and was accompanied by an increase in skipjack. The change in the balance between the species might have been caused by fishing of yellowfin, but could also have been due to environmental changes.

The geographically most extensive data are of the Japanese longline fishery, though these relate only to the stock of larger fish. As pointed out in several published reports, these catches show a serious decline, clearly correlated with increases in the total amount of fishing.

For half of the series of catch per unit effort the most recent information is for 1968 (or 1968-69). Certain sections of the fishery are developing fast, and the 1971 situation may be very different from that in 1968. Two of the three measures of catch per unit effort (for U.S. purse seiners, and Pointe-Noire baitboats), show a sharp drop between 1968 and 1969.

The report of the 1968 Miami meeting examined the relation between catch, effort and catch per unit effort, and reached certain conclusions (Section 2.2.5 of

that report) concerning changes in the amount of fishing in the longline fishery, other things (especially other fisheries) being equal. These conclusions were re-examined taking into account later studies on the yield-per-recruit using estimates of growth and mortality which suggest that even very heavy fishing in the longline fishery will not reduce the yield per recruit. The present conclusions of the group, concerning the longline fishery are therefore as follows:

i — The catch per unit effort of yellowfin in the longline fishery has been reduced by fishing.

ii — Any further increase in longline fishing would increase the longline catch only marginally; the catch per unit effort would be decreased.

iii — A decrease in effort would decrease the catch, but increase the catch per unit effort.

A complete study of the longline fishery must take into account events in the other fisheries on yellowfin, including both the total weight caught, and their size. As a first step in such a study the figures in Table 2 were assembled by the group.

In compiling the data in which an attempt was made to estimate the size composition of all sections of the fishery, it was assumed that

(a) samples from U.S. purse seiners were representative also of Canadian purse seiner catches.

(b) samples by French scientists in West African ports were representative of all purse seiners and baitboat catches, except for the large purse seiners from the U.S., Canada and Japan.

(c) The size composition of longline catches does not vary much from year to year, or country to country, so that the average size composition of Japanese catches in 1962-67 was representative of all longline catches in 1967 and 1968.

While it is highly desirable that the length sampling should be intensified and extended to cover all important sectors of the fishery, the group believes that Table 2 gives a fair representation of the size composition of the catches. The degree of sampling is in fact better than that archieved by most other fishery commissions at a similar stage of existence, and the group believed that the scientists and laboratories concerned should be congratulated, and be encouraged to continue and expand their work.

The data in Table 2 can be fairly readily incorporated into models analyzing the growth and mortality rates to assess the effect on the yield-per-recruit of any combination of fishing rates in the different fisheries. There was no time to make these calculations at the meeting, but arrangements were made to have them carried out during the inter-recess period. Results were presented by the U.S. of similar calculations based on two fisheries. These results, and other yield-per-recruit

calculations made by Japanese scientists enable the following general conclusions to be made:

(a) A year-class of yellowfin would, in the absence of fishing, reach a maximum weight at 2-3 years old (90-120 cm.). The maximum yield per recruit for a given fishing effort would be taken by starting exploitation somewhat before this age.
(b) The age of recruitment (the present fisheries taken as a whole) does not appear to differ greatly from this optimum.
(c) For the range of fishing and mortality rates examined, it appears that the yield-per-recruit would be increased to a moderate extent by increases in fishing effort.

However, in relation to the last conclusion it should be emphasized that the analyses refer at the latest to the situation in 1968, and generally rather earlier. The fishing effort in 1969 was, taking the fisheries as a whole, probably substantially above that in 1968, and judging from known construction of new tuna vessels, that in 1970 and 1971 will probably be even higher. Also there is considerable doubt concerning the exact value of the mortality rates, and the extent to which a reduction in adult stock might affect the average recruitment.

It is possible that further studies which are urgently needed may reveal that the situation may have become more critical by 1971.

3. *ALBACORE*

3.1. *Distribution*

The albacore in the Atlantic can be divided into a northern and southern group. It is probable, from some limited data in the Atlantic, and by comparison with more extensive data in the Pacific, that each group forms a single distinct stock.

The large fish in the stock are exploited by longliners, and the small fish (45 to 80 cm.) by a surface fishery (live bait or trolling) from France, Spain and Portugal. In the southern stock only the larger fish are presently exploited by longliners from Japan, Korea and Taiwan. Recent catch statistics are summarized in Table 4.

3.2. *Biological data*

Discussion on growth rates revealed some differences of interpretation. Some of these could be explained by changes in determination of birth data and there was general agreement that annual increments of about 10 cms. were valid be-

tween lenghths of 50 and 80 cms. This may be the most important information for stock assessment purposes. The tentative comparison between published growth rates per albacore made during the course of the meeting revealed discrepancies which suggest that this study needs to be redone in a more formal fashion.

Useful data from French surface fisheries proved that these were based almost entirely upon two age-groups (60-70 and 70-80 cms. at the time of the fishery); data from the larger Spanish and from the Azorean fisheries are completely lacking and much to be desired. Data from all these fisheries needs to be expressed in terms of catch per unit effort for each size group of fish in order to study year class fluctuations.

Size-composition data is also needed from longline fisheries, especially Korea and Taiwan.

3.3. Stock assessment

Previous studies of the longline fisheries, by the Miami group and others, have shown that, provided due account is taken of the distribution of fishing, in some areas the catch per unit effort has decreased with increased fishing. An examination of the data for the northern stocks showed a clear relation between catch per unit effort and total effort, and that at the highest level of fishery effort (which occurred in 1964-65) the catch per unit effort was about half that occurring at very light fishing. Since the peak years the fishing effort has declined, and in 1968 was rather less than half that in 1965.

The group was not able to make such a detailed analysis for the southern stock, partly because the situation has been complicated by changes in the main concentration of fishing — from big fish in the central Atlantic to medium sized fish in the southern Atlantic. Preliminary analysis suggests that, as in the north, increasing fishing effort up to 1965 has been accompanied by falling catches per unit effort and increasing total catch. However, since 1965 there has not been much change in total effort, decreased Japanese fishing being balanced by increased fishing by Taiwan and Korea. Precise assessment of the level of longline fishing effort greater than that occurring in 1965 is not possible, but the general relation between effort, catch per unit effort and catch suggest that any increase in catch by increased effort will not be very great.

The only detailed catch and effort data for the northeast Atlantic surface fisheries are those from France. These show a decrease in catch per unit effort in the most recent years, the reason for which is not understood, and which may be complicated by the shift during the last decade of fishing locations to the westward of the traditional coastal locations.

While no surface fishery for albacore exists at present in the South Atlantic, surface schools have been seen, especially off southern Africa, so that a fishery might well develop. No assessment has been made of the relative yields to be obtained from exploiting the various groups of albacore.

4. BLUEFIN

4.1. Stock separation

Two species of bluefin are taken in the Atlantic. The southern bluefin is only taken in the south Atlantic, chiefly to the south and southeast of South Africa. These fish seem to be part of a single stock which supports a large fishery in the southern Indian Ocean and southwest Pacific, with a single spawning ground off northwest Australia. There is little information concerning the state of the stock in the Atlantic, though data from other oceans suggest that it is heavily exploited. Because of the movement and interchange of fish (and also fishing vessels) between the oceans, research and management (if any) of the southern bluefin in the southern Atlantic should be part of an integrated program covering the whole area of distribution of the stock.

The bluefin, *Thunnus thynnus*, is widely distributed in the Atlantic. Recent tagging results have revealed east to west movements of small bluefin across the Atlantic, as well as the west to east movement known from earlier results. It is possible therefore that there is a single stock in the whole Atlantic, or a number of separate stocks with a high degree of mixing between them.

Fisheries of bluefin are, however, localized. A wide range of gears are used —traps, purse seiners, longlines, etc.— and the sizes of fish taken also vary greatly. Unfortunately, reliable basic information on catches, fishing effort, and size of fish caught is lacking for several fisheries, and an accurate assessment of the state of the stocks is impossible. As reported by the 1968 Miami Working Group, tagging data shows a high local rate of fishing in the New England purse seine fishery at least in some years. For instance, 29 % of fish tagged in 1969 were recaptured during the 1970 season.

The Miami group concluded that the capture of fish less than 9.8 Kg. would cause a loss in sustained yield. No new information has become available since the Miami meeting to confirm or revise this figure. Tentative yield per recruit calculations suggest that, as might be expected in a longlived fish capable of growing to a very large size, there are likely to be advantages in ensuring a fairly late age at recruitment. It is therefore disturbing that there are apparently substantial quantities of very small bluefin tuna (less than 1 Kg. in weight) being caught off Northwest Africa.

The Sub-Committee therefore believes that further studies are urgently required and that it is essential that the collection of catch and effort and size-composition data be improved. The Sub-Committee believes that these studies will show that there could be an appreciable increase in total catch by avoiding the capture of very small tuna, but pending the results of these studies the Sub-Committee cannot make any specific suggestions concerning minimum size.

It may be noted that since few if any tuna can survive capture in normal commercial gear, protection of small fish may be a complex matter. The Sub-Committee therefore believes that it would be useful to collect information now concerning the detailed operation of the fisheries (e. g., size composition by time and area) in order that effective regulations can be devised to protect the small fish (if so desired) without interfering with catches of larger bluefin, or other species.

5. OTHER SPECIES

5.1. Bigeye

This species was discussed but no new data were available apart from the Japanese study which Hayasi tabled, in confirmation of the earlier Miami conclusion that this species is under-utilized in the Atlantic. Scientists from countries not having longline fisheries had no first-hand knowledge of this species.

5.2. Skipjack

Very few data or new studies are available on this species, generally agreed to be under-utilized; studies on length frequencies in surface and longline fisheries were mentioned as being in preparation. The only point discussed was the identity of tuna larvae from EQUALANT identified as this species but which appear to have a distribution in water cooler than usual for skipjack.

5.3. Billfish

The problems raised by the sports and commercial fisheries for these species were discussed briefly, as were the possibilities of a conflict of interests between the two types of fisheries.

It appears that there are good catch and effort data, and some catch sampling data, in two general areas: the swordfish stocks off New England/Nova Scotia, and the marlin stocks in the tropical longline fisheries; it appears that catch per unit effort declines may be more serious in the blue marlin fishery. Scattered reports from sports fishing interests also suggest declining catch in many areas and statistical information from this fishery should be more closely examined.

6. RECOMMENDATIONS TO STANDING COMMITTEE ON RESEARCH AND STATISTICS

The Sub-Committee on Stock Assessment wishes to place the following nineteen general and special recommendations concerning research and statistics before the Standing Committee.

6.1. General

(1) Finding itself hampered by a lack of timeliness in the data at its disposal, the Sub-Committee was unable to investigate the state of stocks later than those of 1968 in detail and *recommends* that the Commission ensure that up-to-date and reliable statistical information is available in sufficient detail for use by all those concerned in stock assessment, and that the Standing Committee on Research and Statistics examine in detail the steps required to achieve this, e. g., through the establishment of a data bank.

(2) The Sub-Committee *recommends* that the Commission ensure that a historical study of Atlantic tuna statistics be undertaken in a more detailed manner than has been possible at the present meeting and that an agreed historical tabulation of such catch and effort statistics be prepared for future use.

6.2. Catch and effort statistics

(3) Catch data for all tuna fisheries should be reported in such a way that time/location data are not lost and should be tabulated by 1° or, for longline, 5° squares; the guidelines of the norms established by the FAO Panel for the Facilitation of Tuna Research should be followed in respect of all statistics reporting.

(4) Special attention should be directed towards eliminating double reporting of data by adherence to the principle that all landings are reported according to the country whose flag vessels make the catches.

(5) Special attention should be directed towards obtaining spatial information currently and historically in Korean and Taiwanese longline fisheries.

(6) Special attention should be directed towards the specific composition of catches by some countries not reporting this information in a satisfactory manner (e. g. Spain).

(7) Special attention should be directed towards a reexamination of the allocation of reported albacore catches to the north and south hemispheres in longline fisheries.

(8) Conversion from dressed to live weights should be examined and reported for all fisheries. All data reported as live weights should give an indication of method of conversion. The Secretariat should arrange for the compilation and circulation of a report tabulating the conversion factors used.

6.3. Catch sampling

(9) General attention should be given in all tuna fisheries to collecting and reporting data both in terms of total numbers of fish and catch per unit effort, per each size-class of fish, according to an agreed distribution of

size classes. Data should also be reported according to the recommendations of the Expert Panel for the Facilitation of Tuna Research.

(10) Special attention should be directed by the Commission to obtaining length frequency data from the Spanish and Azorean albacore fisheries, both currently and historically.

(11) Length frequency data should be sought from non-Japanese longline fisheries, to enable complete coverage to be maintained of all Atlantic longline fisheries.

(12) Special attention should be given to obtaining catch sampling data for all bluefin fisheries, but especially to purse seiner fisheries and for other small-fish fisheries in the Eastern Atlantic.

6.4. Biological studies

(13) A critical review and collection of new data, as appropriate, is required to solve the apparent paradoxes in the length/weight relationship, especially that for yellowfin.

(14) A critical examination is required of all data on stock structure in Atlantic yellowfin, and special efforts are required to direct research along these lines: such research to utilize all relevant techniques, including tagging, biochemical methods, meristics, and parasite studies.

(15) It is necessary to reexamine the data on growth rates of yellowfin tuna in order to resolve the paradoxes found between scale-reading and modal progression methods.

(16) A special effort should be made to resolve differences in interpretation of growth rates in early years of the albacore, especially with regard to settling the question of spawning dates.

(17) The Commission should initiate a study of billfish population dynamics, firstly, by encouraging a review of data on hand and its preliminary analysis prior to a subsequent meeting of Sub-Committee on Stock Assessment and secondly, by encouraging the pursuit of studies thus indicated to be relevant. Emphasis should probably just be placed upon swordfish and blue marlins.

6.5. Stock assessment studies

(18) More sophisticated yield-per-recruit models should be encouraged for yellowfin tuna using the data already on hand and those which will soon become avilable, and these models should include all forms of fishing gear.

(19) Data should be assembled for preliminary yield-per-recruit models for all bluefin fisheries, using various assumptions concerning relationships of the various fished stocks.

Appendix 1 - Agenda (Annex 5)
Appendix 2 - List of documents (Annex 6)

Table 1. Total catches of yellowfin from the Atlantic. (In thousand metric tons, live weight.)

Longline fisheries	*1963*	*1964*	*1965*	*1966*	*1967*	*1968*	*1969*
China (Taiwan) [1]	0.4	0.3	0.1	0.9	2.3	6.5	10.0
Cuba	1.7	0.9	0.8	0.8	3.0	1.9	
Japan [4]	36.3	38.4	37.3	15.8	11.4	12.1	
Korea [1]	—	—	—	2.9	4.4	2.0	
Venezuela	3.1	1.9	1.8	2.1	2.1	1.2	
Sub-total	41.5	41.5	40.0	22.5	23.2	23.7	
Surface fisheries							
Angola	2.2	3.6	1.9	1.3	0.9	1.1	0.4
Canada	—	—	—	—	—	0.4	
France	21.8	21.4	16.8	18.8	20.8	26.5	
Japan	0.9	2.8	3.7	5.6	8.1	9.3	
Senegal	—	—	0.2	1.4	3.1	2.1	
Spain [3]	—	2.4	3.0	12.3	(0.1)	(0.9)	
U.S.A.	0.2	0.1	—	—	1.0	6.2	18.2
Sub-total	22.7	27.0	23.7	38.1	34.0	46.5	
TOTAL [2]	64.2	68.5	63.7	60.6	57.2	70.9	

1. Probably dressed weight.
2. Including other countries not specified separately.
3. Spanish statistics for 1967 and 1968 are those reported to FAO. Those for 1963-66 are from the Miami report, and include an estimate of the proportion of yellowfin in the reported quantities of «various tuna».
4. Japanese 1968 figure provisional.

Table 2. Number of fish (thousands) of different age (size) classes caught in the major groups of yellowfin fisheries.[2]

Age	Length (cm)	Large purse seiners		Small purse seiners and baitboats		Longliners			Total	
		1968	1969	1968	1969	1967	1968	1969	1968	1969
0	< 50	0	15.0	0	0	0	0	0	0	15.0
1	50-84	65.2	64.8	873.0	239.0	10.6	11.0	14.0	949.2	317.8
2	85-119	16.0	200.6	508.0	354.0	68.4	71.2	90.3	595.2	644.9
3	120-144	57.2	174.0	79.5	195.0	257.9	268.6	340.7	405.2	709.7
4	145-159	38.2	>88.1	63.5	53.0	152.6	159.0	201.7	260.7	342.8
5	160-174	11.5	>11.6	63.5	25.0	31.4	32.8	41.6	107.8	78.2
(6)	>175	0	>.0	0	10.0	5.2	5.4	6.8	5.4	16.8
Total		188.1	554.1	1,587.5	876.0	526.1	548.0	695.1	2,323.5	2.125.0
Metric tons '000 [1]		6.6	18.9	30.0	25.0	23.2	24.2	30.7		
Mean weight per fish (Kg)		35.0	34.1	18.9	28.3	—	44.0	—		

1. Total weight caught in fisheries concerned.
2. Figures are provisional, and subject to verification.

Table 3. **Catches per unit effort in certain yellowfin fisheries. (Skipjack also shown for Angola for comparison.)**

Year	Japanese longline whole Atlantic	Angola (yellowfin)	Angola (skipjack)	US purse seiners	Pointe Noire baitboats	Dakar small baitboats	Japanese purse seiners
50							
1							
2							
3		3.6	0				
4		4.0	0				
5		3.2	0			2.2	
6		2.6	0.3			1.8	
7	4.6	2.4	0.1			1.1	
8	4.5	2.4	0.3			1.9	
9	3.2	2.1	0.2			1.4	
60	3.1	1.2	1.6			1.2	
1	2.2	1.3	1.3			1.5	
2	1.4	1.0	1.5			1.0	
3	1.2	2.0	0.8			0.6	
4	0.9	1.0	1.7		2.8	0.8	
5	0.8	0.8	2.5		2.6	1.4	4,187
6	0.7	0.8	1.7		2.9	0.5	3,211
7	1.0	0.3	3.3	7.8	3.4	0.9	2,646
8	0.8	0.8	3.7	23.8	3.5	0.7	3,142
9				11.5	1.9	0.8	
	From Hayashi: number of fish per 100 hooks.	From Rosado: catch per standard boat/day (baitboat fishing)		Catch per boat/day fishing	Catch/unit effort	Catch per day at sea	Catch per year per fleet

Catch in metric tons unless otherwise noted

Table 4. **Summary catch statistics for albacore. (In thousand metric tons, live weight.)**

	1963	1964	1965	1966	1967	1968	1969
Argentina	—	1.5	1.1	0.8	0.7	1.3	
China	—	—	—	0.2	1.8	8.4	11.5
France	17.8	20.8	16.6	14.3	16.6	14.3	10.0
Japan	21.8	39.8	31.8	28.5	12.5	15.2	
Korea	—	0.5	1.0	6.7	10.3	7.3	
Portugal	—	1.9	5.8	1.0	6.3	6.3	
Spain	28.4	16.6	29.0	25.6	32.4	23.6	
Venezuela	—	—	—	—	—	0.6	
TOTAL	—	81.1	85.3	77.1	80.6	77.3	

Annex 5
(Appendix 1 to Annex 4)
ICCAT/CON/70/5

Agenda for ICCAT Sub-Committee on Stock Assessment Meeting Madrid, November 2-7, 1970

1. Yellowfin tuna *(Thunnus albacares).*
   1.1. Statistics of catch and effort.
   1.2. Distribution and stock separation.
   1.3. Biological studies.
   1.4. Current status of the stocks.
   1.5. The effects of fishing.
      1.5.1. The longline fishery.
      1.5.2. The purse seine fishery.
      1.5.3. The livebait fishery.
   1.6. Interactions between fisheries.
2. Albacore *(Thunnus alalunga).*
   2.1. Statistics of catch and effort.
   2.2. Distribution and stock separation.
   2.3. Biological studies.
   2.4. Current status of the stocks.
   2.5. The effects of fishing.
      2.5.1. The longline fishery.
      2.5.2. The surface fishery.
   2.6. Interaction between fisheries.
3. Bluefin tuna *(Thunns thynnus).*
   3.1. Statistics of catch and effort.
   3.2. Distribution and stock separation.
   3.3. Biological studies.
   3.4. Current status of the stocks.
4. Bigeye tuna *(Thunnus obesus).*
   4.1. Statistics of catch and effort.
   4.2. Distribution and stock separation.
   4.3. Biological studies.
   4.4. Current status of the stocks.
5. Skipjack tuna *(Katsuwonus pelamis).*
6. Recommendations to Standing Committee on Research and Statistics.

Annex 6
(Appendix 2 to Annex 4)

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PART III

NATIONAL REPORTS

REPORT OF TUNA RESEARCH IN BRAZIL

by

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Blackfin tuna, *Thunnus atlanticus* (LESSON) fishery has been carried out for a long time in the coastal waters off the northeast of Brazil, mainly off the States of Rio Grande do Norte and Paraíba.

Primitive fishing methods and gear define this fishery as an artisan activity which is more intensive during the last quarter of the year when schools come closer to the shore for their spawning.

The first published papers on the biology and fishery of blackfin tuna in the northeast of Brazil (Anonymous, 1927; Magalhaes, 1936, 1939a and 1939b), dealt with the specific external characteristics, seasonal occurrence, description of the fishery methods used and possibilities for industrialization.

Since 1964 the Marine Biology Institute of the Federal University of Rio Grande do Norte (Natal, State of Rio Grande do Norte) started publication of scientific results of its program for the study of blackfin tuna and biology, namely, feeding habits (Cruz de Paiva, 1964b), reproduction (Monte, 1964), biometry (Nomura & Cruz, 1966; Soares & Cruz, 1967) and fishery biology (Cruz & Paiva, 1964a; Cruz, 1965 and 1967). The objective of the program, still in course of being carried out, is to achieve an assessment of blackfin tuna stock in northeastern Brazil.

A primitive fishery of oceanic tunas on the edge of the continental shelf in the waters off northeastern Brazil has long since been carried out, using sailboats and, more recently, motorized boats with troll-lining and/or handlining (Fonseca, 1963). Technical improvement of this fishery, chiefly by the introduction of long-lining, proved to be viable and economically important (Lee, 1957), giving rise to the development of a small tunaboat fleet on which certain data have been published (Paiva & Mota, 1961; Paiva & Muñiz, 1964).

Industrial tuna fishery off the coast of north and northeastern Brazil began in 1956, the Japanese tunaboats using Recife (Pernambuco) as their home port.

This fishery reached its high point in the first years of the decade recently ended. After that it declined due to problems of a socio-political nature and the Japanese fleet moved to other bases in the Tropical Atlantic.

During the first semester of 1957 the R/V Tôkô Maru made a cruise to conduct an oceanographic survey and exploratory fishing in tuna areas adjacent to the Brazilian coast (Nakamura *et al*, 1958), giving wider support to the newly established exploitation of fisheries.

Since then a number of research works have been published on the biology and fishery of oceanic tunas. These papers are based on data obtained from the Japanese fleet (Paiva, 1961a and 1961b; Fonseca, 1962b; Lima & Wise, 1962; Moraes, 1962; Fonseca & Barros, 1963; Moraes, 1963; Barros, 1965; Barros & Fonseca, 1965) dealing with feeding habits, reproduction, biometry, distribution and stock composition. At the same time technological studies on the use of longlining were carried out (Anonymous, 1961; Fonseca, 1962a).

Data on Cuban tunaboat fishing operations in areas adjacent to the Brazilian coast in 1963 were also analyzed (Nomura, Paiva & Buesa Más, 1965). These revealed a sharp decrease in the abundance of tunas in relation to that at the beginning of fisheries exploitation.

Reference should be made to systematic studies of tunas in Brazil and to the summary of biological information on these species (Paiva, 1962a and 1962b), as well as considerations on tuna conservation in the Atlantic (Paiva, 1967).

At present the Marine Sciences Laboratory of the Federal University of Ceará (Fortaleza, Ceará) is conducting a study on the overall evaluation of fishing resources in northeastern Brazil. Based on data from the Japanese Atlantic longline fishery (Wise & Le Guen, 1969), it appears that there is a possibility of attaining a maximum annual catch of tunas amounting to 30,000 in the Guianas and Bahía areas.

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CANADIAN RESEARCH REPORT, 1969-70

by

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Fisheries Research Board of Canada
Biological Station, St. Andrews, N.B.

The St. Andrews Station is concerned chiefly with research related to fisheries for swordfish and tuna along the edge of the continental shelf between the Grand Banks and Cape Hatteras, N.C.; in the Caribbean Sea and off the west coast of Africa. Other FRB stations on the Atlantic coast have not, as yet, become involved with research on the tunas and billfishes, although both the St. John's and Dartmouth laboratories have substantial physical oceanography research programs, the results of which will be pertinent to the work of the Commission.

A. Status of the fisheries

1. Swordfish

Canada has a substantial longline fishery for swordfish in the Northwest Atlantic. Landings in 1969 amounted to about 4,300 metric tons (round weight). This is only slightly (3 %) less than the amount landed in 1968 but continues the downward trend which started immediately after the first full year (1963) of longlining for swordfish. About 50 % of the catch was made from Georges Bank southward to Cape Hatteras. The remainder came from the Nova Scotia Banks area (29 %) and from the Grand Banks (22 %). There was no appreciable change in either fishing effort or size composition during 1969. However, the high proportion of small swordfish in landings from some areas is cause for concern about the future of this fishery.

2. Tuna

Canadian landings of tuna in 1969 are reported to have been about 1,300 metric tons of which about 900 tons were mixed yellowfin and skipjack from the Gulf of Guinea. The remainder (400 tons) was made up of several species (unidentified)

landed incidentally by swordfish fishermen and of small quantities of «giant» bluefin taken by traps in St. Margaret's Bay. In addition, an estimated 130 tons of bluefin were taken in the sport fishery on the east coast of Newfoundland.

3. *Sharks*

Incidental landings of porbeagles *(Lamna nasus)*, mako *(Isurus oxyrinchus)*, and hammerheads *(Sphyrna sp.)* amounted to 7.5 tons as compared to 11 tons in 1968. There is no shark fishery *per se* but swordfish fishermen land some of their catches.

B. Special research studies

1. *Swordfish*

Although there was little change from 1968, the mean size of swordfish continued to decline and is now 62 kg (round weight) as compared with 103 kg in 1963, the first full year of the longline fishery. This cannot be explained solely by the expansion of effort into areas yielding larger numbers of smaller fish, and the possibility of overfishing must not be overlooked.

The rate of growth of swordfish appears to be rapid with fish reaching a weight of about 4 kg in September of their first full year of life (assuming April-August spawning) and about 15, 39, 69, and 113 kg respectively in the following four years. Tagging returns, although only eleven in number, indicate that subsequent growth is equally rapid.

An examination of the gills and gastro-intestinal tracts of 18 swordfish showed numerous nematodes *(Contracaecum incurvum)* and a few giant digenetic trematodes, *Hirudinella marina*. In the rectum, there was a high incidence of the cestode *Fistulicola plicatus*. On the gills, *Tristoma coccineum* and *T. integrum* occurred. The difference in relative incidence of *T. coccineum* and *T. integrum* on swordfish from the Mediterranean and the Atlantic and the presence of a distinct species of *Tristoma* on Hawaiian swordfish suggest that these monogenetic trematodes may be useful as biological tags to distinguish populations of swordfish.

2. *Tuna*

Only a modest research effort has been expended on tuna to date. Some data on the general biology of tuna as it affects the fishery have been collected from incidental tuna catches in the longline fishery for swordfish. Additional data have been obtained from the inshore fishery (largely a sports fishery) for bluefin and by occasional observers aboard commercial purse seiners off the eastern United States and west Africa coasts. The data include size, sex and food along with some information on environmental conditions and some (from log records) on

the distribution of catches, the amount of fishing effort and the principal species. A series of cruises to the Caribbean Sea from 1965 to 1970 have provided substantial quantities of plankton but the collections have not yet been examined for tuna larvae.

The behaviour of large bluefin tuna was studied in St. Margaret's Bay during July 1969 in cooperation with scientists from the Woods Hole Oceanographic Institution. Sonic tags, that were also capable of telemetering water and fish temperatures, were used. Four (4) fish were tracked for a total of 30 hours and 200 km. They all left the Bay within 6 hours of release but did not seem to be unduly disturbed by the tagging operation and appeared to have fed soon after release.

There is a regular weekly sampling program at the one tuna cannery on the Atlantic coast but this is concerned only with species identification and size composition. Individual weights (dressed) are obtained from incidental landings by swordfish fishermen but unfortunately it is not always possible to identify the species, since these fish are landed with heads and fins removed. Whole weights are available for most of the catches of giant bluefin landed at sport fishing centers in southwest Nova Scotia and on the east coast of Newfoundland.

Catch and effort data are obtained from the log records of large tuna seiners but no analysis of these records has been attempted as yet.

Environmental data (chiefly temperatures and salinities) are available fron research cruises but many swordfish fishermen maintain log records and record water temperatures in areas where longlines are set. These records are being processed for studies of swordfish distribution but may also be valuable for tuna research.

During 1969, sampling from purse seine catches in the Atlantic included length measurements for 100 yellowfin and 1,065 skipjack. Weights from all of the bluefin landed from the sport fishery in Newfoundland are tabulated by the Tourist Board of that province and made available to St. Andrews. From the swordfish fishery, we examined 331 tuna of three species (yellowfin, bigeye and bluefin) and tabulated the landed (dressed) weights.

3. *General*

(a) *Tagging.* The accompanying table summarizes Canadian large pelagic fish tagging programs since 1963. The only species that received special attention were swordfish and giant bluefin. The remainder of the releases were made on an opportunity basis during infrequent trips on commercial purse seiners off the eastern United States and west Africa coasts, and on commercial and research longline cruises in the Northwest Atlantic from Trinidad to the Flemish Cap.

The results up to 1968 were reported by Tibbo and Beckett (1968) and by Beckett (1970). The latter report also contains an evaluation of tags and tagging techniques.

	1963	'64	'65	'66	'67	'68	'69	'70*	*Re-captures*
Bluefin									
Purse seine west Atlantic .	—	17	236	—	—	—	—	—	39
Longline west Atlantic . .	—	—	8	3	3	2	—	—	0
Canadian coastal waters . .	18	6	52	71	193	24	44	9	13
Yellowfin									
Purse seine east Atlantic . .	—	—	—	—	378	—	—	—	3
Longline west Atlantic . .	—	1	—	4	5	—	2	—	0
Bigeye									
Longline west Atlantic . .	—	—	—	4	10	4	2	—	0
Skipjack									
Purse seine west Atlantic .	—	73	6	—	—	—	—	—	3
Purse seine east Atlantic .	—	—	—	37	—	—	—	—	1
Mixed Bluefin and Skipjack									
Purse seine west Atlantic .	—	—	60	—	—	—	—	—	3
Unidentified tunas									
Longline west Atlantic . .	—	2	—	—	1	—	1	—	0
Swordfish									
Longline west Atlantic . .	—	28	23	13	15	6	20	—	2
Harpoon west Atlantic . .	—	—	—	—	—	19	—	40	9

* To August 31.

(b) *Miscellaneous.* Recaptures of tagged blue sharks suggest an anticlockwise seasonal migration with fish wintering in the Gulf Stream. Some fish move east during the spring and then north and west along the edge of the continental shelf between the Grand Banks and Georges Bank during the summer and early autumn. Other sharks apparently move straight into the continental shelf areas south of Cape Cod in the summer and probably perform a similar but much reduced migratory pattern.

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REPORT OF INVESTIGATION IN FRANCE

by

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Situation of fisheries in France

During the past seven years French production of tunas has reached an average of 46,500 tons, distributed among albacore (13,000 tons), bluefin tuna (17,000 tons) and Tropical tunas (yellowfin, skipjack and bigeye) (31,700 tons).

	1963	1964	1965	1966	1967	1968	1969
Albacore . . .	14.2	17.33	13.8	11.9	13.5	11.6	8.3
Tuna	1.2	1.7	1.4	2.8	2.0	1.8	1.5
Trop. tunas . .	22.7	21.8	28.9	37.9	33.1	41.7	35.8

Almost all catches of albacore were made in the Atlantic from June to October, from the coast of Portugal to the south of Ireland and in the Gulf of Biscay; bluefin tuna come from the Gulf of Biscay and the French coast on the Mediterranean; tropical tunas are caught all year round from the south of Mauritania to the Gulf of Guinea.

Albacore: Insofar as albacore, it is important to keep in mind that contributions over the past ten years show a clearly declining trend, since they have decreased from 18,000 tons in 1962 to 8,000 tons in 1969, while they had reached 22,000 tons in 1957.

1960	17,241	tons
1961	15,193	»
1962	18,038	»
1963	14,435	»
1964	17,321	»
1965	13,821	»
1966	11,924	»
1967	13,525	»
1968	11,620	»
1969	8,342	»

This decrease in catches is attributable to a lesser abundance of the fish as also to a reduction in the number of vessels engaged in fishing.

No explanation can be given for this phenomenon but two hypotheses could be examined:

— Natural fluctuation due to weak recruitment or ecological changes depending on environmental conditions.
— Reduction in population resulting from development of fisheries in the mid-western Atlantic.

By way of indication, the number of French vessels engaged in the fishery of albacore now barely amount to some 240, of which more than 90 % fish with trolling gear, as against more than 600 units between 1958 and 1960. The fishing season generally lasts from June to October, but its duration varies depending on the year, i.e., yield and meteorological conditions.

In e general sense, troll fishing vessels make three or four trips per season, the yield per vessel being on the order of seven to eight tons per trip, that is to say, 20 to 30 tons per season.

Live-bait boats go out to sea more frequently, the approximate catch being 30 tons per season, and 7 to 9 tons per trip.

In 1969 the greater part of catches were unloaded at ports in Brittany and Vendee (7,768 tons), the rest at La Rochelle (563 tons) and St. Jean de Luz (11 tons).

Bluefin tuna: This fishery, engaged in especially by boats from St. Jean de Luz, exceeded 3,000 tons during 1965 and has declined after 1966 as the following statistics show:

1960	553	tons
1961	885	»
1962	1,149	»
1963	644	»
1964	648	»
1965	1,000	»
1966	1,656	»
1967	1,080	»
1968	681	»
1969	570	»

Investigations

Three organizations in France have engaged in the study of tunas during recent years:

— ORSTOM in its African laboratories has regularly observed the details of yellowfin fishery and studied its populations.

— Since 1967 CNEXO has observed the development of albacore campaigns and has studied catch composition.
— During the period from 1950-1957, in 1961 and also since 1967, ISTRM has studied environmental conditions of the fisheries and formation of concentrations and has proceeded to measure and study feeding and tagging.

Work done in Africa has enabled the compilation of basic data on yellowfin biology, its growth, structure of population and development of fishing effort.

Since 1950 investigations on albacore have allowed early opening of the fishery season guiding the vessels toward the first concentrations in June. Studies have been made on conditions to form fisheries and since 1967 the catch composition is analyzed; also all information was gathered to obtain a better understanding of fishing conditions.

Four types of sizes were found in catches: approximately 55, 63 and 75, and above 86 cms.

In 1968 an exceptional length of 44 cms. was noted.

Tagging

1,390 tunas were tagged in 1960 and from 1967 to 1969. Of these, 29 were bluefin tuna, 40 were skipjack and 1,321 albacore. Tags currently utilized are Floy Tag FT 1 Type (plastic darts) and WN. FM. 67 (metal dart) with yellow plastic ribbon.

To date, 2 bluefin tuna and 30 albacore have been recovered a year or two after tagging, one of the bluefin tuna having crossed the Atlantic from east to west in ten months.

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JAPANESE REPORT ON PROGRESS OF TUNA FISHERIES AND RESEARCH ACTIVITIES IN THE ATLANTIC OCEAN

by

AKIRA SUDA

Progress of Japanese tuna fisheries

Annual catch (thousand metric tons) by Japanese tuna fleets is shown in Table 1. It had increased yearly until 1965, in which year it attained its peak. Thereafter the catch decreased sharply to about 60 thousand tons, less than half of the largest catch in the past. Catches by surface fisheries, live-bait and purse seine fleets increased during the first several years of their operation. These catches have almost levelled off or have shown just a gradual increase over the last four years except for 1968, when the catch was unusually large. On the other hand, the catches by longline fleets have been subjected to dramatic fluctuation throughout the years observed.

Recent longline fishery is characterized by the following:

1. Remarkable decrease both in fishing effort and in catch;
2. Dispersion of fleet to higher latitudinal areas;
3. Change of fish species which are subject to commercial fishery.

Such features are well illustrated in Figs. 1 and 2. The distributions of concentrations of yellowfin and albacore are quite different and the major longline grounds for these species hardly overlap. These separate distributions by the two species explain very clearly the negative correlation observed in «coefficients of fishing efficiency of unit gear» between these two species as shown in Fig. 3. Under such relationship, effective management of fishery may be possible if needed in future.

Tuna research activities in Japan for 1969

1. Computation of catch statistics on tuna fisheries

Under this project the following three types of routine work are being undertaken on an annual basis:

1) Collection of commercial fishing records for the current year; 2) processing longline data for the preceding year; and 3) publication of a longline yearbook on the second-to-last year. Along these lines, the 1967 yearbook of longline statistics was published in 1968. Also, processing of longline data for 1968 was completed in 1969 and the results published in March, 1970.

Besides, historical development of the Japanese Atlantic longline fishery was reviewed, employing all past data on catch and effort, 1968 included, to update the analysis. The outcome of the work is summarized in the previous chapter.

II. Environmental studies

Oceanographic data were made available from the areas shown in Fig. 5 through the six experimental cruises by the Fishery Agency.

Table 1. Annual amount of effort and catch (In 1000 tons)[1] by Japanese tuna fleets. (Based on the data by Statistics and Survey Div., Min. Agr. & For.)

Year	Longline[4]		Live bait[4]		Purse seine[5]		Surface fisheries[2]
	E.	C.	E.	C.	E.	C.	C.
1957	26	16					
1958	51	31					
1959	62	50					
1960	88	68					
1961	88	69					
1962	106	94	5	3			3
1963	128	107	5	6			6
1964	182	119	6	5	1	0[3]	6
1965	209	133	6	9	1	4	13
1966	156	80	6	7	3	7	14
1967	65	39	6	8	5	7	15
1968[6]	(96)	(44)	(6)	(12)	(7)	(17)	(29)

1 Including bluefin, albacore, yellowfin, bigeye, swordfish, blue marlin, black marlin, striped marlin, sailfish, skipjack and frigate mackerel.
2 Live bait and purse seine fleets combined.
3 488 tons.
4 In terms of number of boats.
5 In terms of number of operating units of boats.
6 Tentative values.

III. Biological studies

III-1. Experimental cruises

Biological survey performed on the aforementioned experimental cruises.

The outline for this project by the Fishery Agency is shown in Fig. 5 and Table 2. (Hereafter, the area south of 30°S is referred to as «South Atlantic Ocean» regardless of longitudinal degree.)

a) Yellowfin.

1. South Atlantic Ocean. This species was rarely found in the offshore area. However, along the coast of South America it was found in moderate density from July to October.

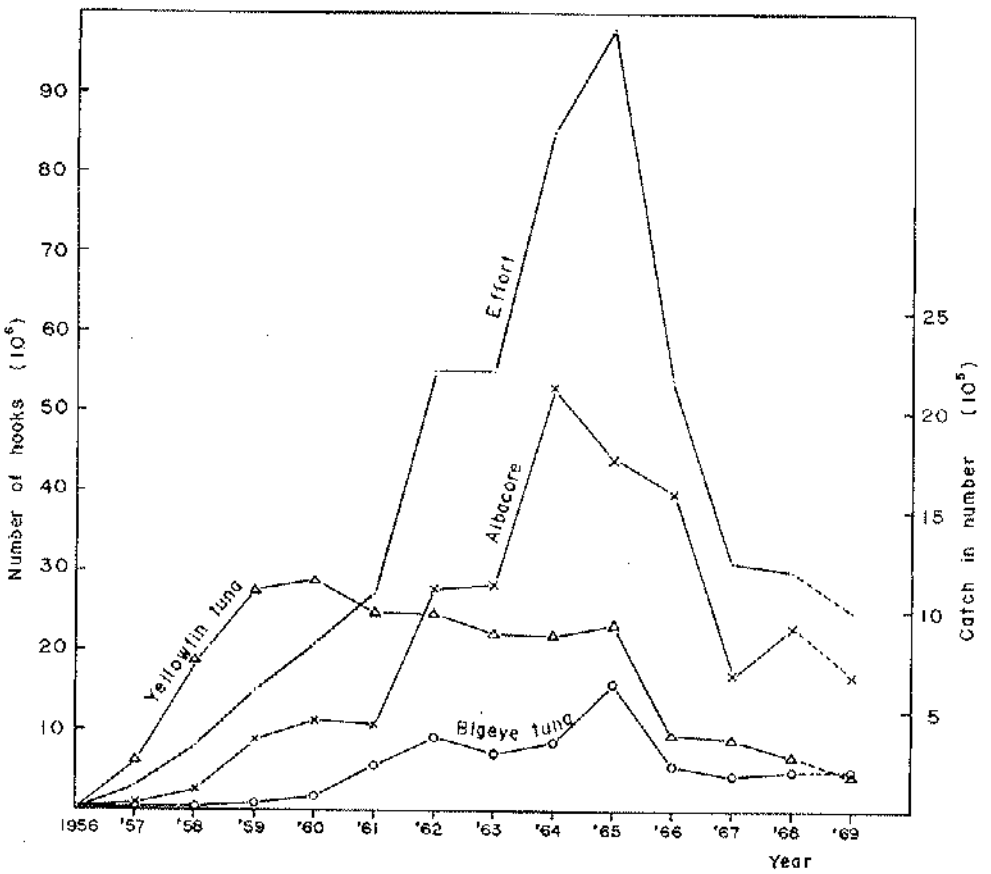

FIG. 1. — Yearly changes in overall numbers of hooks used and catches in number of major tunas species for the Japanese longline fishery in the Atlantic Ocean, 1956-1969.

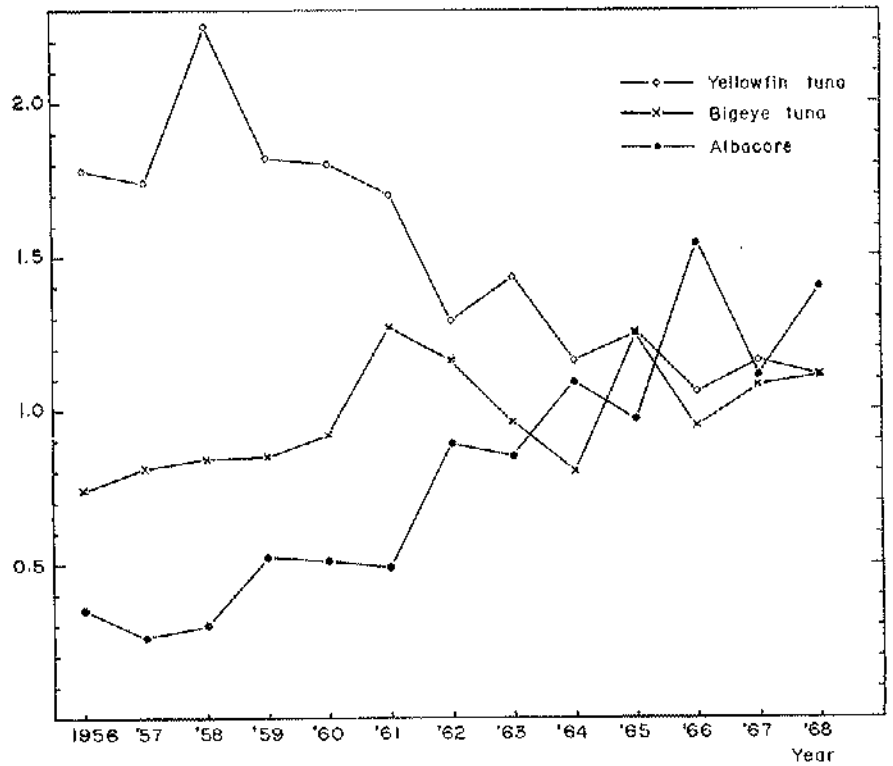

FIG. 2. — Annual values of «coefficient of fishing efficiency of unit gear» for major tuna species in the Japanese longline fishery, in the Atlantic Ocean, 1956-1968. (Ordinate represents values of «coefficient of fishing efficiency of unit gear».)

2. Caribbean Sea. Average hooking-rate (number of fish caught per one hundred hooks used) during the survey cruise was 1.0-1.5. Size of fish ranged from 110 cm. to 150 cm. in fork length. Gonad examination suggested the cooccurrence of both sexually developed and underdeveloped individuals in the season. Blood was sampled for subpopulation identification.

b) Albacore.

1. South Atlantic Ocean. This species was densely distributed over the entire area surveyed between 30°S and 40°S. Size of fish ranged from 60 cm. to 115 cm.
2. Waters off Brazil. Large size fish from 90 cm. to 115 cm. with developed gonads were found, suggesting that spawning of this species might occur in this area.

3. Caribbean Sea. Average hooking-rate during the cruise was approximately 0.5. Length frequency distribution of the catch was limited to a narrow range from 90 cm. to 100 cm. Sexually inactive fish occupied a major portion of the catch.

c) Bigeye.

1. South Atlantic Ocean. Concentrations of this species were found off Uruguay and as far as Southern Brazil from September to November. Observation of gonads indicated that immature fish were a major component of the catch.

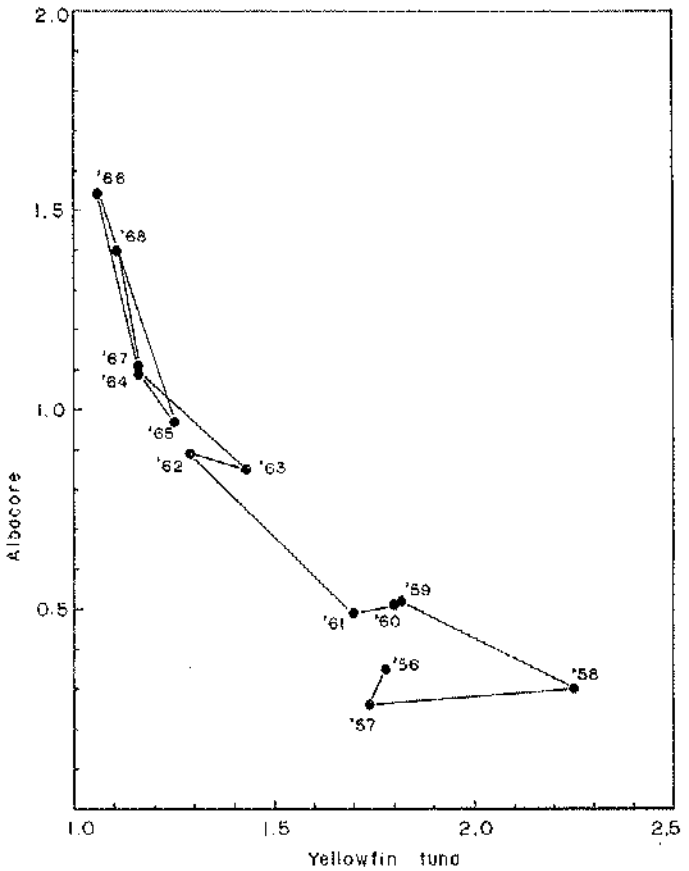

FIG. 3. — Correlation in annual values of «coefficient of fishing efficiency of unit gear» between yellowfin and albacore in the Japanese longline fishery of the Atlantic Ocean. (Abscissa and ordinate illustrate «coefficient of fishing efficiency of unit gear» for yellowfin and albacore respectively.)

7

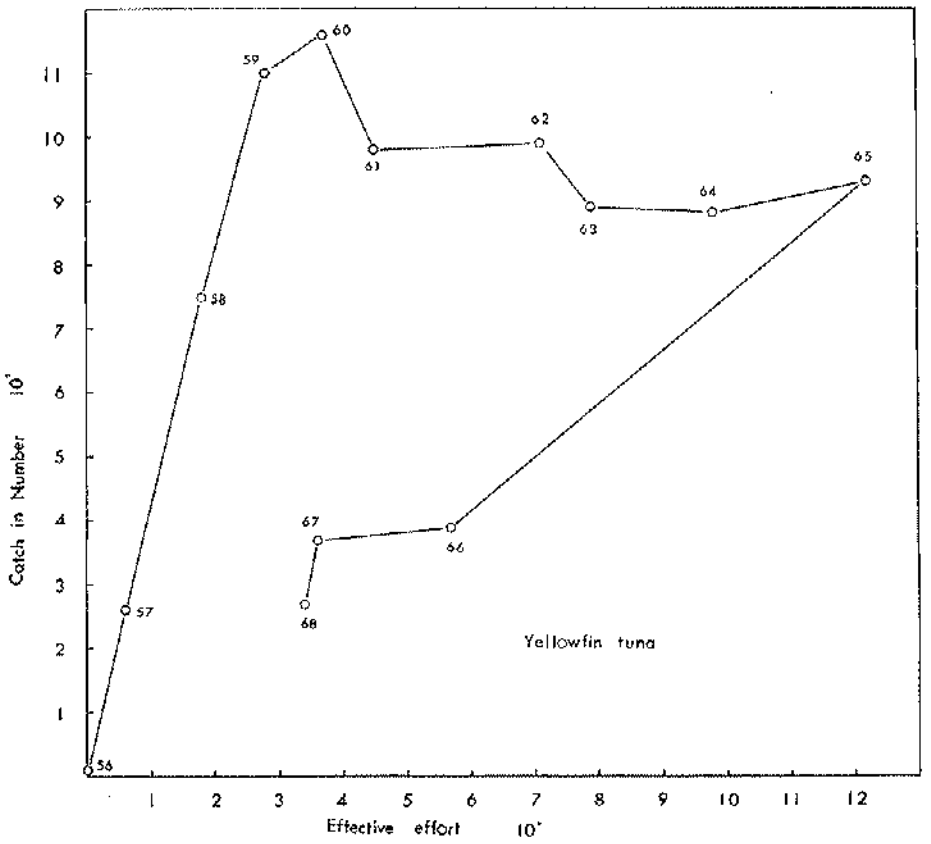

FIG. 4. — Annual amounts of standardized fishing efforts of longline (in terms of effective hooks) and resultant catches of yellowfin in number.

d) Southern bluefin.

1. South Atlantic Ocean. Occurrence of the species west of 10°W was very scarce. In the area west of the standard meridian line, large size fish 140 cm. in average length, were a major component. On the contrary, in the waters east of the standard meridian line, younger fish, 100 cm. to 120 cm. in average length were found simultaneously with large size fish.

e) Swordfish.

1. South Atlantic Ocean. Biological features of this species were similar to those of the bigeye distributed in the same area.

Table 2. List of experimental cruises performed by the Japanese Fishery Agency for the study on tunas and marlins.

Cruise No.	1	2	3	4	5	6
Name of boat	Shoyo-Maru	Shoyo-Maru	Azuma-Maru No. 37	Azuma-Maru No. 37	Azuma-Maru No. 37	Azuma-Maru No. 37
Date	Nov. 11, '68-Jan. 17, '69	Dec. 23, '69-Jan. 14, '70	May 26, '69-Aug. 1, '69	Aug. 11, '69-Oct. 2, '69	Oct. 14, '69-Dec. 5, '69	Dec. 26, '69-Feb. 2, '70
Area	30°S-50°S West of 9°W	Caribbean Sea Gulf of Mexico	30°S-40°S 10°W-55°W	30°S-50°S West of 45°W	30°S-50°S 40°W-60°W	South of 32°S East of 30°W

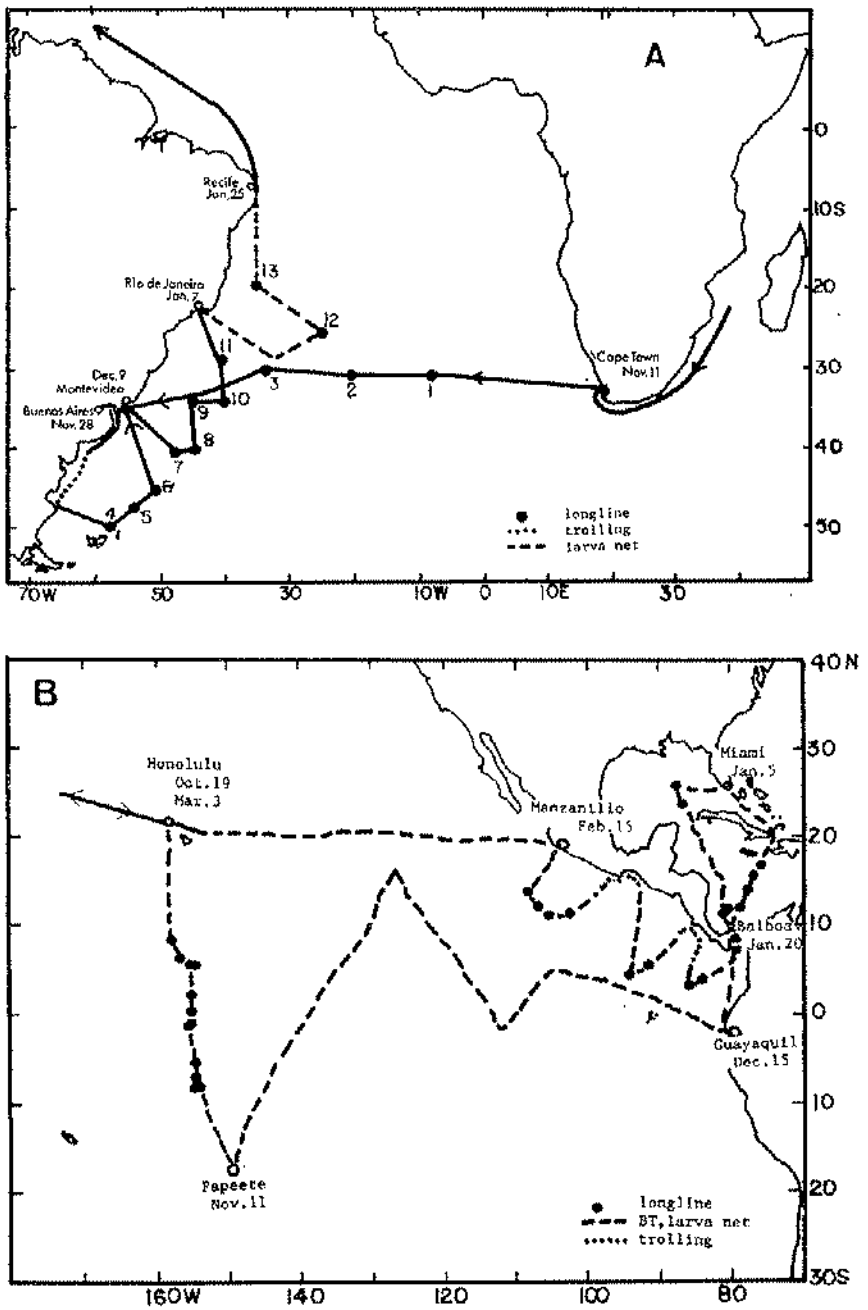

FIG. 5. — Illustrations of tracks of survey cruises projected by Fishery Agency in 1969. A, Cruise No. 1, Shoyo-Maru; B, Cruise No. 2, Shoyo-Maru.

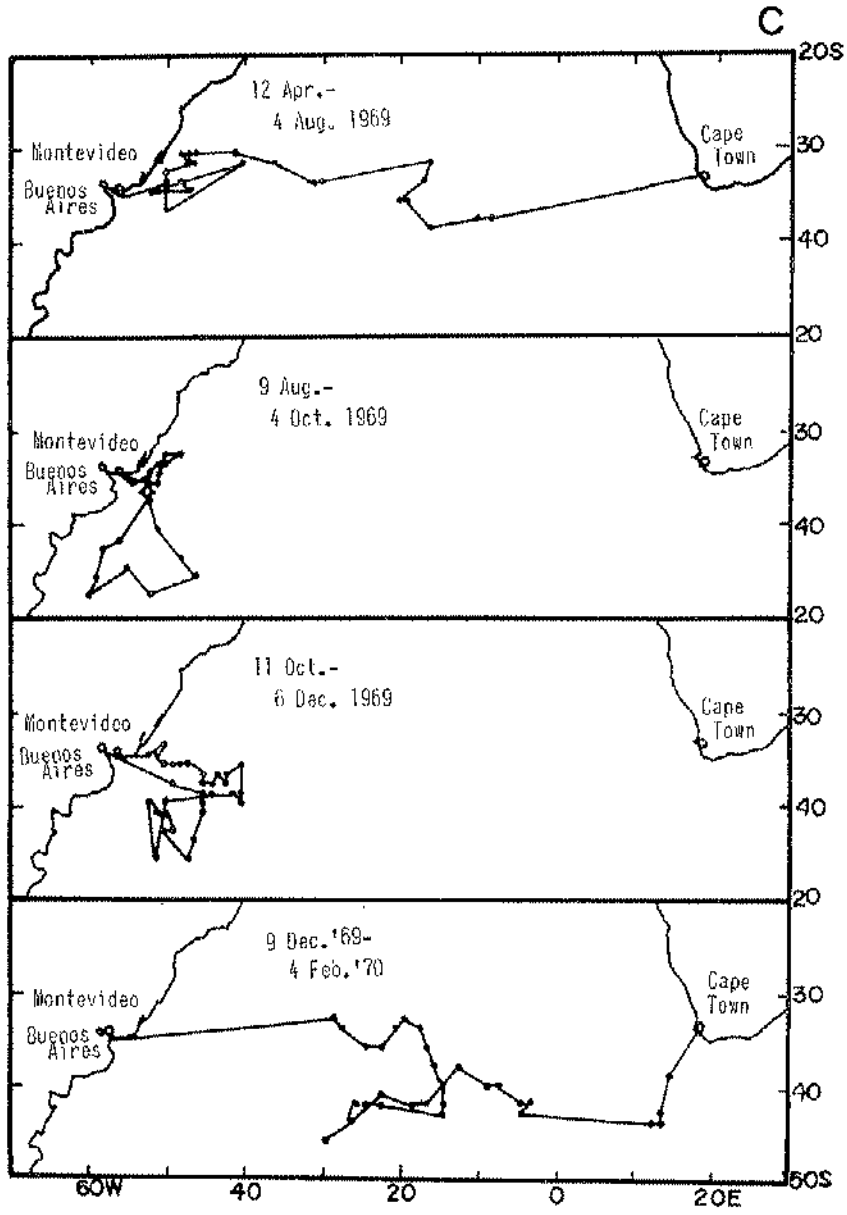

FIG. 5.—C, Cruise No. 3-Cruise No. 6 (from top to bottom), Azuma-Maru No. 37.

III-2. Biological Surveys on the Purse Seine Fleet

Biological investigations were performed at the request of the Fishery Agency on every purse seine boat engaged in fishing off the west coast of Africa. Fifty-five hundred yellowfin and sixteen hundred skipjack were sampled and measured in fork length. Also, about two hundred gonads of yellowfin were examined.

III-3. Laboratory Studies

The population structure of yellowfin tuna was examined employing the information on hooking-rate, size composition by area and by gear, development of gonads and occurrence of larvae. According to the examination a working hypothesis was established, which assumes that groups of fish intermix at some stage of their life and that the groups do not exist in complete isolation.

At the same time a review was made of the possible biological significance on yellowfin population which would result from management measures taken on longline fishery and/or surface fishery.

TUNA LONGLINE FISHING IN KOREA

by

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1. Brief history of tuna longlining in Korea

Tuna longline fishing was undertaken in Korea for the first time in 1957 when a 229 gross ton tuna longliner made a trial cruise to the neighboring waters of Nicobar Island in the Indian Ocean. In 1958 fishing operations were carried out with increasing intensity in American Samoa. Four cruises were made there and this led to the successful establishment of a Korean commercial fishery on a sound basis. Since then a rapid development has been made, and the present industrial level has been achieved with positive encouragement and support given by government policy, together with heavy investments by private concerns.

The Government planned the purchase of 7 tuna longliners in the first year of its first 5-year Economic Development Plan which started in 1962, and released the funds required therefor. In 1963 the Korean tuna fleet increased to 10 longliners.

At the same time, citizen loan projects for the tuna fishing industry were successfully implemented and thereby a total of 48 tuna longliners had been made available for fishing operations by December, 1965.

In order to facilitate further development of deep sea fisheries, a fishery loan was agreed upon between a French-Italian consortium and the government agency in 1962. In accordance with the realization of this loan, a total of 33.8 million dollars (91 deep-sea fishing vessels with a total of 22,724 gross tons) were made available in 1963.

The Korean Marine Industrial Development Corporation was established in order to achieve proper management and operation of the fishing boats. Those tuna longliners which have been delivered under the contract are now actively engaged in tuna fishing operations in the Pacific and Indian oceans as well as in the Atlantic.

As the number of tuna longliners has increased each year, fishing activities have also expanded from the South Pacific to the Atlantic and Indian oceans. In 1964 a 370 gross ton tuna longliner made one trip in the Atlantic, and in 1966, three 350-ton tuna longliners started fishing for tuna in the Indian Ocean. Fishery statistics for tuna longliners by year are as follows:

Year	No. Boats	Catch (MT)	Value ($ US 100)
1962	5	656	209
1963	10	2,559	755
1964	20	9,180	783
1965	48	12,582	2,554
1966	130	23,956	9,180
1967	152	36,206	12,586
1968	179	43,519	14,976
1969	191	66,638	22,831

2. Present status of tuna fishing

From a review of 1969 figures, this being the year on which the latest statistics are available, it can be seen that a total of 191 tuna longliners (46,431 GT) caught 66,638 metric tons of tuna and tuna-like fishes, which amounted in value to 22,831 thousand dollars in the world's major fishing grounds. These figures account for an increase by 53 percent and 52.4 percent, respectively, in fishing production and foreign exports over those corresponding to 1968. Such growth was due to major improvements in fishing efficiency of tuna longliners undertaken by the Korea Marine Industrial Development Corporation and partly to an addition of 12 tuna longliners in 1969.

To break down the catch by area, the Pacific Ocean contributed most, the Atlantic was second, and the Indian Ocean third. Total catch was composed of 38.1 percent from the Pacific Ocean, 38 percent from the Atlantic, and 23.9 percent from the Indian Ocean.

In 1969 fourteen foreign fishing bases were used by the longliners as a result of the establishment of a new one at Portluis in the Indian Ocean. These are Samoa, Fiji and Santo in the Pacific area; Freetown, Tema, Saovicente, Monrovia, St. Martin, Laspalmas and Abidjan in the Atlantic area; and Penang, Durban, Portluis and Tamatave in the Indian Ocean.

The size of tuna longliners in Korea ranges from 100 GT to 640 GT. The breakdown of the fishing fleet as of 1969 by gross ton class shows that 52 percent of the fleet was made up of the 100-200 ton class, while 40 percent were in the 200-400 ton class, and 8 percent by those in the class over 400 tons. There

is a tendency in the tuna longline fishing fleets to increase the average tonnage of fishing boats. For instance, in 166 the average tonnage per fishing vessel was only 111 gross tons; by 1969 the average tonnage per vessel increased to 243 gross tons.

In 1969 a total of 4,895 crews engaged in fishing activities for tuna, of which about 80 percent was composed of an age-class from 20-35 years. The number of tuna fishermen by age in 1969 is as follows:

Age-class

Total	20-25	26-30	31-35	36-40	Over 40
4,895	560	1,952	1,393	706	284

Tuna catches by fishing area in 1969

Fishing area	Fishing base	No. boats	Catch (MT)
Grand total		191	66,638
Pacific Area	Sub-total	93	25,438
	Samoa	68	19,659
	Fiji	18	4,884
	Santo	7	895
Atlantic Area	Sub-total	57	25,405
	Freetown	21	8,147
	Tema	11	6,309
	Saovicente	5	3,309
	St. Martin	4	1,533
	Monrovia	2	763
	Laspalmas	10	3,340
	Abidjan	4	2,004
Indian Area	Sub-total	41	15,795
	Penang	6	906
	Portluis	3	1,047
	Durban	21	10,825
	Tamatave	11	3,017

3. Tuna fishery prospects in Korea

Tuna longlining in Korea has contributed much to increase its exports, one of the national basic policies. It has also promoted national prestige overseas. Since its marine resources in coastal and off-shore waters are limited, it is inevitable that Korean fisheries should expand to overseas fishing grounds. Therefore,

the assurance of a firm position in international fisheries would be of importance to the development of the Korean fisheries industry in light of the fact that tuna longline fishing is able to easily earn foreign currencies and can make a great contribution toward bolstering employment. Thus it is expected that tuna fishing in Korea will contribute about one half of the exports in amount of the entire fisheries product under the third 5-year Economic Development Plan.

There are, however, many difficult problems facing the tuna fisheries in Korea, such as lack of capital, self supply of domestically manufactured products, the development of pole-and-line and purse seine fishing, improvement of marketing and training of fisheries technicians and research activities in the Oceans. If the Government continues to extend its valuable assistance to tuna fisheries and to its research activities, this industry will grow on a sound scientific basis. The basic outline of countermeasures for the above problems is as follows:

a. Replacement of fishing vessels.

It is necessary to replace old fishing vessels with new ones in order to rationalize their management and to secure new fishing vessels to diversify fishing activities.

b. Improvement of marketing system.

In order to develop sales outlets abroad it is necessary to secure refrigerated carriers and to reduce dependency on conventional sales systems.

c. Training of fishery technicians.

As the number of fishing vessels increases annually requiring additional crews, it is necessary to train fishery experts and to raise the level of crews with a view to increasing efficiency in fishing and to prevent accidents from occurring to crews..

d. Self-supply of tuna bait.

Since a preliminary project for the self-supply of tuna bait was successfully completed in 1969-70, it is required that all tuna fishing vessels be supplied with saury bait produced domestically.

e. Cooperation with international organizations.

In order to promote the activities of international and regional organizations in the field of fisheries, Korea will cooperate with the organizations in collaboration activities and research. In relation with international research, the government established a 5-year research plan on deep sea fishing grounds.

f. Establishment of fishing base facilities.

In order to save foreign currency and to provide health care for crew members, it is necessary to establish clinics and machine shops at foreign fishing bases in cooperation with host governments, if facilities are not available.

Table 1. Annual catch in the Atlantic, by species. (Unit: MT)

Year	Total catch	Albacore	Yellowfin	Bigeye	Others
1966	7,114	6,744 (94.8)	—	249 (3.5)	121 (1.7)
1967	11,050	10,279 (93.0)	—	276 (2.5)	495 (4.5)
1968	12,624	7,285 (57.7)	1,957 (15.5)	227 (1.8)	3,155 (25.0)

Table 2. Annual catch by firms, in the Atlantic.

Name of Firm	1967		1968		1969	
	No. boats	Catch (MT)	No. boats	Catch	No. boats	Catch
Je-Dong Co.	4	653	44	2,360	10	3,436
Kong Heung	5	1,750	6	2,371	10	3,749
Wha Yang					1	530
Korea Wonyang			5	768	5	3,167
Won Yang Fisheries	4	973	4	2,881	6	2,451
Dong Wha			2	440	4	1,462
Tae Pyungyang	1	257	1	360	1	353
Hae Wae Fisheries			1	238	6	1,333
Dae Sue Yang	1	885	3	1,326	4	1,860
KMIDC	31	6,532	8	1,880	10	7,064
TOTAL	46	11,050	34	12,624	57	25,405

Table 3. Average catch per trip by size class of boats.

Size class	Navigation time	Fishing per trip (days)	Land	Total	Average catch (MT)
150-200 GT	31	45	16	92	75
201-250	32	53	10	95	118
251-300	28	66	15	109	118
301-350	28	67	12	107	165
351-400	58	97	53	208	178

REPORT ON RESEARCH CARRIED OUT IN MOROCCO REGARDING TUNAS

by

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For several years M. Aloncle, Researcher for the Moroccan Fisheries Institute, has been engaged in the study of tunas in the «Ibero-Moroccan» area.

During this period it has been possible to establish a balance of what is currently known, to make certain observations and to reach certain hypotheses on the biology of the principal species: bluefin tuna. H. Aloncle has also had the opportunity to participate in an experimental fisheries cruise.

The results of his work were published in the Bulletin of the Maritime Fisheries Institute of Morocco, No. 12, December, 1964, and No. 14 of July, 1966. His conclusions are as follows:

Bluefin tuna, *Thunnus thynnus*, is permanently found in the Ibero-Moroccan Bay. Their presence has been detected throughout their three phases:

— immature;

— in the course of spawning migration and spawning activity;

— while in feeding dispersion.

Bluefin tuna weighing between 30 and 60 Kgs. sometimes caught during the fall off the central Moroccan coastline, and those caught in the summer in the Gulf of Biscay undoubtedly belong to the same population:

A first group retreats to the north toward the Gulf of Biscay, a second group follows the Algarve and Andalusian coasts toward the east and later to the south and southeast, and finally, a third group after wintering in the eastern part of the Canary Islands, slowly make their way northward, limited by the Moroccan coast to the east and by the thermal barrier at 21 west longitude to the west. These last two groups return and meet again in the same waters in the fall. It appears that only very large tuna, with an approximate weight of 100 Kgs. or more, pass through the Strait of Gibraltar to the spawning ground in the

Mediterranean Sea, while tunas weighing less than 100 Kgs. spawn in the Ibero-Moroccan Bay. However, drift-longliners sometimes observe and capture very large tunas in July and August in central Moroccan coastal waters. What are these specimen? Where have they spawned? Never having had an opportunity to examine them, they constitute so many question marks to which we can give no answer. The experimental cruise of the «Danguy» whose principal objective it was to discover new possibilities for tuna fisheries in the Ibero-Moroccan Bay, shows negative results.

We cannot hope that the few specimen found around the Madeira archipelago or in the vicinity of Cape Bojador are going to open new horizons for fisheries, all the more so since meteorological conditions observed are often unfavorable. Fall fishing in the central area will, until further orders, continue to be supplemental activity for fishermen who in normal times engage in trawling or sardine fisheries.

Notwithstanding, small, modern, well equipped purse seiners with crews of expert fishermen, may hold a place in the rational exploitation of pelagic fishes on the Moroccan coast: tunas, mackerel, sardines, anchovies. A fisheries industry exclusively engaged in tuna catches should, above all, concentrate on the tropical and equatorial Atlantic, bearing in mind that Moroccan tunas cannot in this case be more than a subordinate activity.

Following several years of absence, the recent arrival of a new researcher to the Laboratory of the Maritime Fisheries Institute will enable a resumption of this study. At present Morocco is not in a position to offer any supplemental data.

INVESTIGATIONS OF TUNA (*Thunnus thynnus*) IN SPAIN

by

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1. Introduction

We have utilized statistical data beginning in the year 1929, taken from the five traps which functioned in the Gulf of Cádiz over these 42 years. These were located off the towns of Barbate, Sancti-Petri, Tarifa, La Línea and Isla Cristina.

Production at Barbate and Sancti-Petri seems to follow a certain fluctuating rhythm with periods of six or seven years. Since 1963 trap yields are below normal. Considering catches of small tuna, 45 kgs. in weight or smaller, it is noted that the years in which these were plentiful had favorable repercussions eight or nine years later. Since 1952 catches of small tuna are very low, coinciding with the scarcity of the larger ones.

2. Temperature and transparency of sea water

We have effected studies on weekly tuna catches in relation to the temperature of sea water taken at the Barbate trap with a bathythermograph. It is our experience that the sexual maturity phase of tuna appears at temperatures of 16 to 17°C, reaching their greatest productivity at temperatures of 18°C at a depth of 0 to 10 meters, 17°C at 20 m., and at 16°C at 30 m. In the post spawning period, optimum temperatures are 20 to 21°C at a depth of 0, 10 and 20 m., and 19°C at 30 m.

We have also observed the high correlation between transparency of sea water measured with a Secchi disc, and tuna yield in the Barbate trap.

3. Size and weight

We have studied the distribution of size frequency of tuna caught at the Barbate trap from 1956 to 1970. Emphasis is placed on the predominance of the

same generation over several consecutive years and, in general, the massive disappearance of the corresponding generation beginning with a zoological length of 250 cm. (equal to fork length).

Size-weight relation, estimated over the years 1956-1970 results from the equation of $P = 0.000019 \cdot L^3$, for 467 coming run or prespawning tuna, and sizes between 25 and 279.5 cm. zoological length (fork), stating P in kilograms and L in centimeters. For returning (postspawning) tuna and over the same period, the equation is $P = 0.000053 \cdot L^{2.8}$.

4. Age

The relation between size and age estimated after the von Bertalanffy equation is as follows:

$$l_t = 355.84\ [1 - e^{-0.09(t+0.89)}]$$

Age was studied in the precaudal vertebrae and between the fourth and fifth, since these are the easiest and safest to extract when the tuna's head is cut off at the plant, length-age relation obtained by this formula being as follows:

Age in years	Length in cm. (fork length)
1	55.6
2	81.4
3	105.1
4	126.7
5	146.4
6	164.4
7	180.9
8	195.9
9	209.7
10	222.3
11	233.8
12	244.3
13	253.9

5. Nutrition index or condition factor ($K = 100.000.\ P/L^3$)

We offer several average values estimated for 1958 tuna from Barbate, separating them by sex and migratory phases; that is to say, coming or prespawning, and returning or postspawning. Range of sizes studied is 75 to 279 cm.

Coming

	Males:	1.84 to 1.93 in prespawning
	Females:	1.93 to 1.97 in prespawning

Returning

	Males:	1.64 to 1.67 in postspawning
	Females:	1.60 to 1.62 in postspawning

6. Maturity

During the months of May and June the greater part of tuna caught are in the prespawning stage, and in the months of July and August, the postspawning. That is to say, spawning occurs at the end of June or beginning of July.

Minimum size spawn we have found to be 115 cm. in length. In other words, three-year-old tunas.

7. Tagging

To date and in the years 1960, 1961, 1962, 1965 and 1967, we have tagged 312 tunas of which 19 have been recovered in the Atlantic Ocean and in the Mediterranean Sea. Of these, 15 were taken in the Atlantic: 6 off the southern coast of Portugal, 5 south of Spain and 4 in Morocco. Four were recovered in the Mediterranean: 1 in the Gulf of Lyon off the coast of France, 1 at La Línea, off the coast of Spain at the entrance to the Strait of Gibraltar, 1 at Ceuta, city at the entrance to the aforementioned Strait, and 1 off the eastern coast of Spain. I was informed verbally of 2 more tags having been recovered at Tripoli (Libya), but these have not been returned to me.

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REVIEW OF SOUTH AFRICAN TUNA FISHERIES AND RESEARCH

by

C. S. DE V. NEPGEN

1. Review of tuna fisheries state of development

Before 1960 tuna were relatively unknown in the South African fishing industry and were assumed to be an occassional migrant to the Cape waters, caught only by sport fishermen throughout the summer months.

During 1960 a research vessel of the Division of Sea Fisheries located a vast school of longfin tuna west of Saldanha Bay. As a result of this observation the Division decided to undertake exploratory fishing with longlines off the Cape west coast. The exercise was very successful, and by the end of 1960 a number of commercial fishermen commenced catching tuna, using mostly converted pilchard boats of 50 to 75 feet long. The catch was preserved with ice.

The fishery expanded rapidly to produce annual catches of 2,000 to 3,000 tons in 1962 and 1963. Thereafter the fishing effort rapidly decreased and by the end of 1964 most commercial firms had suspended their tuna fishing operations. This was due to a decline in catch rate as well as the low price which South African caught tuna commanded. The boats were in fact diverted to the more lucrative rock lobster fishery.

2. Research

South African tuna research was designed to investigate the biology and environment of the four species commonly caught off South Africa. This involved experimental fishing and a certain amount of hydrological sampling. The results of this research are reported by de Jager, Nepgen and van Wyk (193) and Nepgen (1970).

3. Statistics

3.1. Review of tuna statistics

The annual commercial landings of tuna since the fishery commenced in 1961 are shown below.

Year	Landings (lb)* 10^{-3}
1961	± 800
1962	± 4,000
1963	3,987
1964	3,072
1965	23
1966	49
1967	62
1968	62
1969	44

* The weights are for gutted but not headed fish. Catch composition by numbers and weight for the four different species can be obtained from Nepgen (1970), page 9.

4. Review of sampling programme

No sampling of the length distribution of commercial catches is conducted. The length composition of the catch of research vessels is given by de Jager, Nepgen and van Wyk (1963) and Nepgen (1970).

5. Stock assessment

No stock assessment of tuna has been done by South Africa.

An analysis of Japanese catch rate data off the South African coast has, however, been published. (Nepgen 1970; Investigational Report No. 90, especially Table I, page 3).

6. Tagging

Tagging is being contemplated, and at present the feasibility of marking tuna obtained by pole and sport fishing is being examined.

7. Environment

The hydrology of the seas around south and west coasts of South Africa is fairly well known, and has been reviewed by Shannon (1966). The environment more specifically related to tuna is dealt with by de Jager, Nepgen and van Wyk (1963) and Nepgen (1970).

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UNITED STATES RESEARCH REPORT TO THE FIRST REGULAR MEETING OF THE ICCAT COUNCIL, 1970

by

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The U.S. Atlantic tuna fisheries

Table 1 shows United States tuna catches for the last 25 years in the Atlantic. Catches were very modest, well below 5,000 tons annually, mostly from traps, until the early 1960's when purse seiners began a summer fishery for bluefin and skipjack off the northeast coast of the U.S. (Table 1). This fishery has been quite variable in production (like the trap fisheries which preceded it); in 1970 it appears that catches will once again rise to about 5,000 tons of bluefin and skipjack. The fishery appears to fluctuate at least partially due to changes in availability of bluefin and skipjack caused by environmental factors that we do not yet fully undertand.

Fisheries for bonito and little tunny have been almost exclusively trap fisheries along the coast of the U.S. south of Cape Cod. They too have shown considerable variability, but with a general tendency to decline in production as trap fishing has become less feasible economically.

Until 1967, recorded yellowfin catches by U.S. vessels in the Atlantic amounted to only a few hundred tons from a short-lived longline fishery in the Gulf of Mexico. In 1967, following preliminary exploratory trips some years previously, U.S. purse seiners began fishing in the eastern tropical Atlantic, principally for yellowfin. This fishery developed primarily as a response to annual closure of the yellowfin fishery in the eastern tropical Pacific for conservation purposes. The eastern tropical Atlantic fishery grew rapidly (Table 2), but in 1970 its growth

Table 1. United States Atlantic tuna catches[1] since 1945.

	Species[2]						
	Bluefin	Bonito	Little tunny	Yellowfin	Skipjack	Unclass	Total
	Metric tons						
1945	626	300	132	—	—	—	1,058
1946	537	236	155	—	—	—	928
1947	493	100	300	—	—	—	893
1948	1,359	61	273	—	—	—	1,693
1949	1,242	65	331	—	—	—	1,638
1950	575	56	134	—	—	—	765
1951	799	26	168	158	—	—	1,151
1952	256	35	339	—	—	—	630
1953	882	84	31	—	—	—	997
1954	647	133	32	7	—	—	819
1955	407	68	48	—	—	—	523
1956	208	32	40	151	—	—	431
1957	454	42	15	302	—	—	813
1958	1,123	27	6	284	—	—	1,440
1959	1,278	113	81	111	—	—	1,583
1960	637	80	7	—	—	—	724
1961	1,074	63	1	—	—	—	1,138
1962	3,969	78	7	17	463	—	4,534
1963	5,672	96	5	207	2,995	5	8,980
1964	4,882	29	2	126	3,980	56	9,075
1965	3,184	83	10	—	64	114	3,455
1966	1,238	56	21	—	39	4	1,358
1967	2,319	22	7	977	489	10	3,824
1968	635	43	—	6,104	3,219	113	10,114
1969[3]	1,239	105	—	18,193	3,768	510	23,815

1 Includes catches by U.S. vessels landed at Puerto Rico and outside U.S.; does not include catches from other oceans landed at Puerto Rico. Does not include sport catches or catches of species other than those listed. Does not include more than 3,500 tons caught by U.S. vessels in the eastern tropical Atlantic in 1958-63.

2 Bluefin, *Thunnus thynnus*; bonito, *Sarda sarda* (probably includes varying quantities of other small tunas); little tunny, *Euthynnus alletteratus*; yellowfin, *T. albacares*; skipjack, *Katsuwonus pelamis*.

3 Provisional.

was slowed by the discovery of profitable yellowfin fishing in the eastern tropical Pacific outside of the I-ATTC regulatory area. The amount of fishing and the catch by U.S. seiners in 1970 off the African coast is expected to be roughly the same in 1970 as it was in 1969.

Table 2. Catch (metric tons) by U.S. purse seiners in the eastern tropical Atlantic, 1967-69.

Year	1967	1968	1969
Number of seiners	3	8	22
Catch			
total	1,450	9,376	22,618
per boat/day	11.5	36.5	14.3
Yellowfin			
total	977	6,104	18,193
per boat/day	7.8	23.8	11.5
Skipjack			
total	473	3,158	3,768
per boat/day	3.8	12.3	2.4

United States Atlantic tuna research

U.S. research on tunas and billfishes in the Atlantic began at the Woods Hole Oceanographic Institution in 1950, in cooperation with the Bureau of Commercial Fisheries (now National Marine Fisheries Service). Work at WHOI has included a long-term tagging program on bluefin tuna and billfishes; to date some 30,000 tunas and billfishes have been tagged and over 2,100 tags returned. These tag returns have furnished important information on migrations and populations of bluefin tuna, white marlin, and other species, as well as the basis for estimates of exploitation rates of young in the northwest Atlantic.

The WHOI program has also included extensive morphometric and meristic studies on northwestern Atlantic tunas and billfishes. The age and growth of northwestern Atlantic bluefin has been determined by the reading of annuli on scales and vertebrae, and from analysis of size frequency data.

Tuna programs at the Tropical Atlantic Biological Laboratory of the National Marine Fisheries Service began in the early 1960's with the International Cooperative Investigations of the Tropical Atlantic, which resulted in the three EQUALANT expeditions by 14 research vessels from 7 nations in 1963 and 1964. Since that time twelve tuna fishery-oceanography cruises, about equally divided between

the eastern and western tropical Atlantic, have been made by research vessels of the Tropical Atlantic Biological Laboratory.

Laboratory work has concentrated on the relations between the stocks of yellowfin and albacore and their fisheries. A major source of information has been the extremely valuable data on the longline fisheries published by the Fisheries Agency of Japan. Several analyses of these data have been performed, showing the effects of the fisheries on the stocks of tunas. Another important source has been the data collected by the French ORSTOM organization and its several laboratories along the west coast of Africa. Several reports on the longline fishery have been published, and yield-per-recruit estimates have been made for the eastern tropical Atlantic yellowfin tuna indicating that the optimum age for first capture is near 2 years.

Work on albacore has concentrated mainly on analysis of catch and effort data from the Japanese longline fleet. An hypothesis of two stocks of albacore, northern and southern, each one making seasonal migrations, has been developed. Present indications are that the stocks of albacore may not yet be fished at an optimum rate.

Attention has been devoted to basic biological work on Atlantic tunas — a study of the food of yellowfin and skipjack is largely completed, and information is being collected for a study on fecundity and spawning of albacore. An extensive study of the distribution of tuna larvae has been one of the results of the ICITA expeditions.

TAIWAN'S TUNA FISHERIES AND TUNA FISHERY RESEARCH, 1970 *

by

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Taiwan, also known as Formosa, is an island situated to the southeast of the Chinese mainland between the East China Sea and the South China Sea. It is separated from the mainland by Taiwan Strait. The total area is only about 36,000 km.^{2}, of which 60 % is mountainous and only 40 % arable. With this limited area and a growing population, currently about 14 million, increasing interest and attention are being directed toward the exploitation of marine resources. Partially as a result of government efforts during recent years, fisheries production has increased from 120,000 metric tons in 1952 to 560,000 metric tons in 1969.

Taiwan's fisheries are classified for statistical purposes into four categories-deep-sea fisheries, inshore fisheries, coastal fisheries, and fish culture. Deep-sea fisheries include large and medium otter trawl fisheries and pair trawling for demersal species, deep-sea (distant-water) tuna longline fisheries carried on by vessels over 50 tons, and large purse seine fishing by teams of four to seven vessels for small pelagic species. Inshore fisheries include tuna longline fishing by boats of less than 50 tons, bottom longlining for sea breams and miscellaneous species, handline fishing and trolling, purse seining, gillnetting and drifting, and harpooning. Coastal fisheries include all longshore fishing and fishing in rivers, lakes and streams by means of sampans or bamboo rafts. Fish culture includes brackish water fish farming of milkfish, grey mullet, tilapia and shrimp, plus fresh water culture of carp, tilapia and mullet and shallow water culture of oysters, clams and algae.

The tuna longline fishery was introduced into Taiwan in 1913 by Japanese fishermen. At first the fishery was limited to the coastal waters off Kaohsiung, a southern port. For many years the fishery was limited to a few hundred miles

* This report was submitted to the ICCAT SCRS meetings by the author and, with author's permission, is included in this volume as a special contribution.

from Kaohsiung, but in 1954 the fishery began to expand to the Banda Sea and the Flores Sea. By 1956 operations were extended to the Indian Ocean, and by 1961 they had reached as far as the Atlantic and the Mediterranean. In recent years, because of the practical requirements of fishing in distant waters, overseas bases have been set up at many foreign ports close to important fishing grounds. At

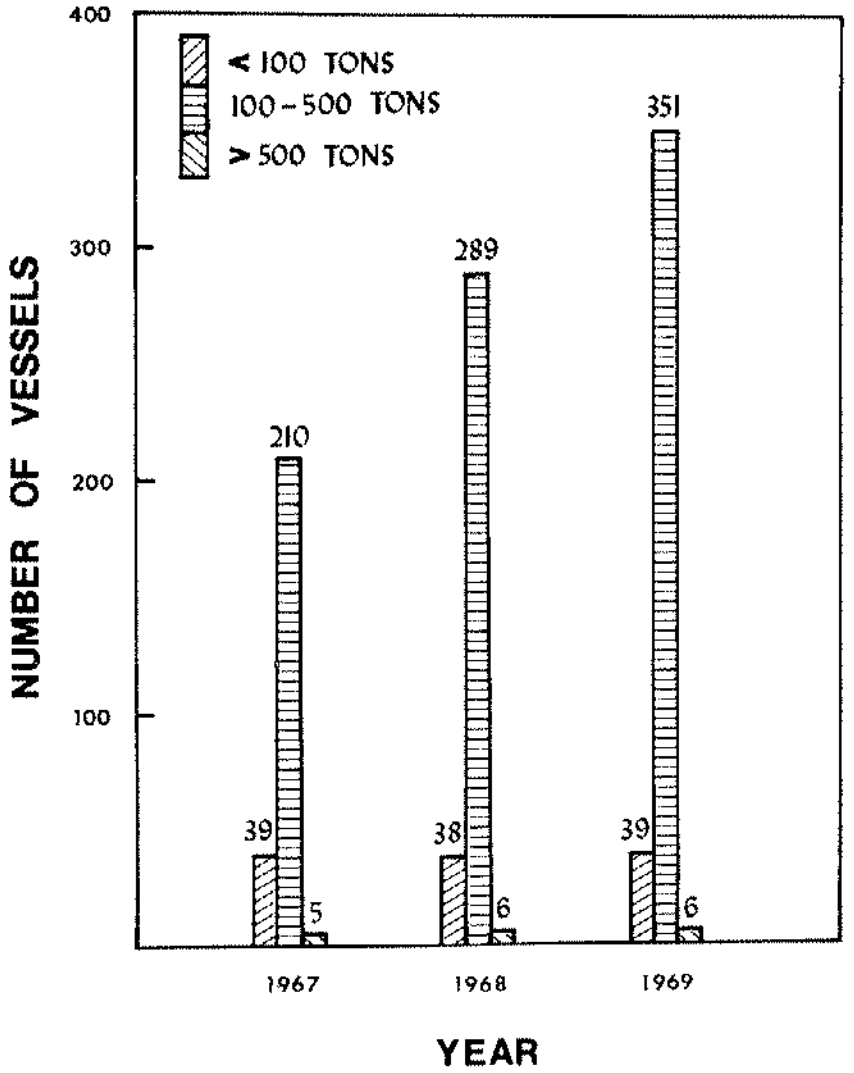

FIG. 1. — Taiwan's deep-sea tunas longline fishing vessels, 1967-1969.

these bases the longliners can get supplies and repairs and can sell their catch locally or tranship it for export. As of 1969 Taiwan had more than 50 overseas bases around the world.

In 1962 there were 647 tuna vessels in Taiwan, of which 42 were engaged in deep-sea fishing. The fleet has grown rapidly in recent years, and as of 1969 there

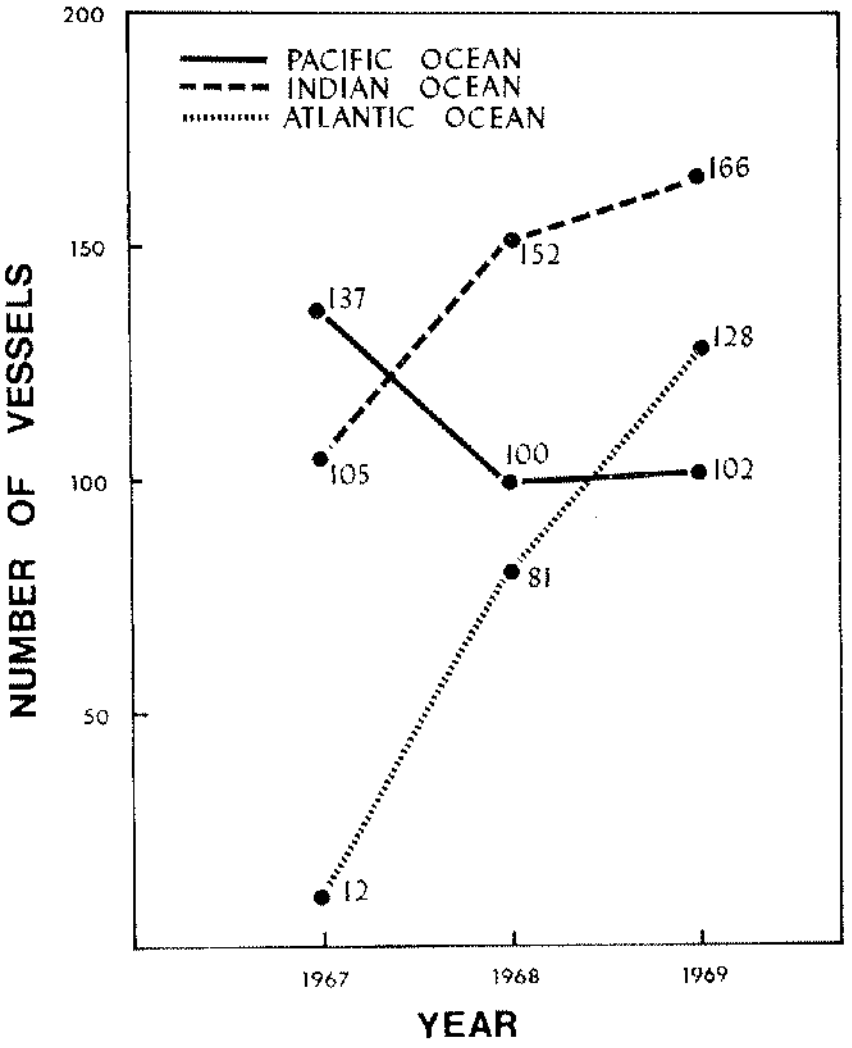

FIG. 2. — Distribution of Taiwan's deep-sea tunas longline fishing vessels in the three oceans, 1967-1969.

were 1,039 tuna longliners. Tuna production increased from 25,500 metric tons in 1962 to 120,000 metric tons in 1969. The tuna fishery is now the single most important fishery to Taiwan, both in production by weight and in value.

A total of 254 deep-sea longliners were in operation at the end of 1967. By the end of 1968 there were 333 vessels, and at the end of 1969 there were 396 deep-sea longliners. In 1967 the most important fishing ground for longliners was the Pacific, followed by the Indian and then Atlantic Oceans. By 1969 the longliners concentrated in the Indian Ocean, with the Atlantic in second place. There are indications that the concentrations of Taiwanese fishing effort has been shifting from the Pacific to the Indian to the Atlantic Ocean (Figures 1 and 2). The number of trips by the deep-sea fleet more than doubled from 1967 to 1969 (Figure 3).

Table 1 shows the total landings of tunas (dressed) by the deep-sea fleet in 1967-69. Landings nearly tripled from 1967 to 1969.

As of 1967 the Taiwan Fisheries Bureau began a system of logbook reports by the captain of the deep-sea longliners, and coverage has improved steadily — 17 % in 1967, 31 % in 1968, and about 40 % in 1969.

A education program for the captains, to recognize the need for furnishing such information, is expected eventually to bring the coverage to a truly useful level.

In the interim it is possible to establish tentative catch rates for Taiwanese longliners in the various oceans from the data available:

Catch rates (fish/100 hooks)

	Pacific Ocean	Indian Ocean	Atlantic Ocean
1967	5.4	3.3	4.1
1968	5.4	4.8	4.8

These catch rates are low, but show signs of improvement.

Fisheries research is carried on by the Taiwan Fisheries Research Institute of the Taiwan Provincial Government and the Institutes of Oceanography and Fishery Biology of National Taiwan University. The Fisheries Research Institute is devoted primarily to research and experimentation in the fields of fishing techniques and fish processing, exploratory fishing, propagation of fish fry, etc., while the work of the Institutes of Oceanography and Fishery Biology covers all phases of fishery biology, including the study of the resources, migrations and distribution of commercial fish, etc.

The Taiwan Fisheries Research Institute began to work on the tuna longline fishery in 1954, limiting its operations to collection and analysis of records from

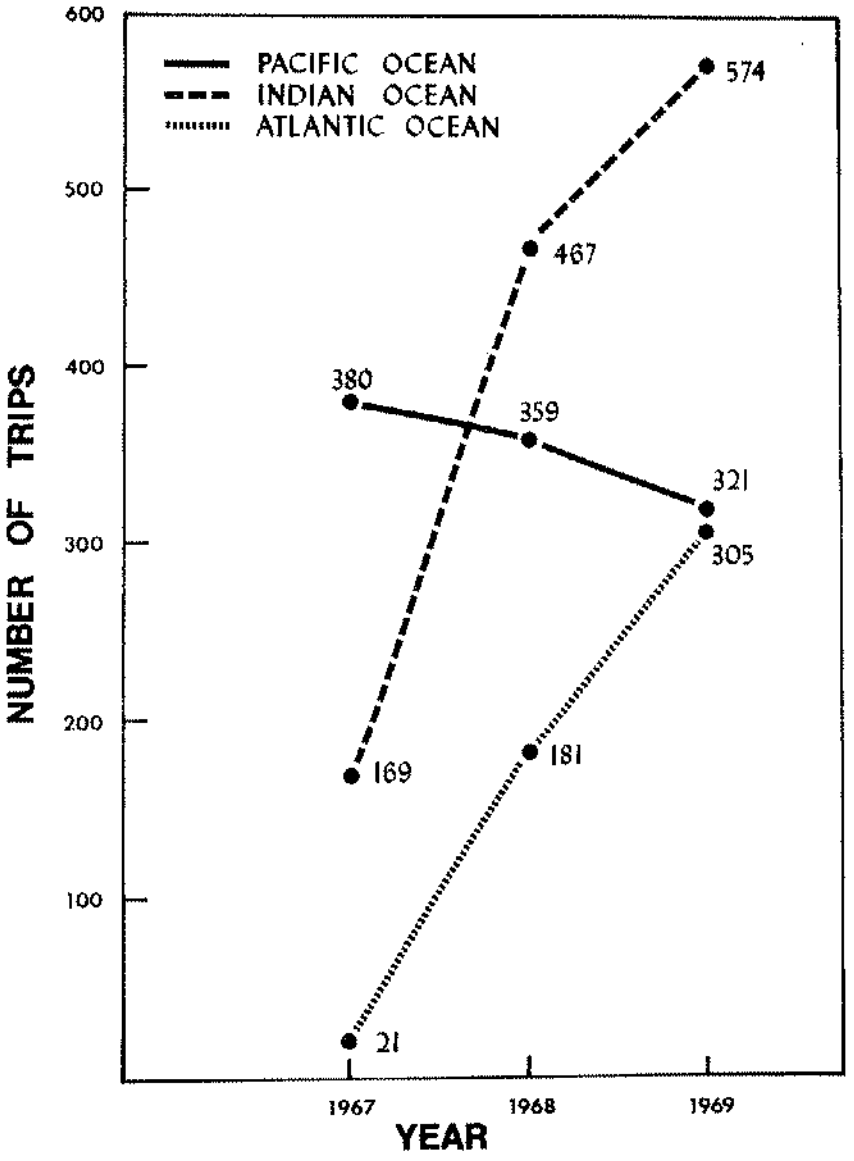

FIG. 3. — Annual fishing trips made by Taiwan's deep-sea tuna longliners, 1967-1969.

the local fleet and collection of some biological statistics at the Kaohsiung fish market. As the fleet developed remarkably in recent years and its problems multiplied, it became increasingly evident that more work was needed, both for providing the industry with essential information and for use in decision making by the Taiwan Fisheries Bureau.

In 1967 the Bureau began a study on production and marketing of the longline fishery with the financial assistance of the Joint Commission on Rural Reconstruction. Emphasis was placed on collecting information about the landings of the longline fleet at overseas bases, with some attention to a study of fishing effort. A project to recruit high caliber personnel and to promote close coordination among the research organizations was begun in 1969. A joint research group of personnel of the Bureau and the Institutes was organized at the suggestion and with the assistance of the Joint Commission. Dr. R. T. Yang of the Institute of

Table 1. Fish caught in various oceans by Taiwan tuna fleet, 1967-1969 (metric tons).

Years	Areas	Total	TUNAS					Marlins	Other
			Albacore	Bigeye	Yellowfin	Bluefin	Young tunas[3]		
1967[2]	Sub-total	38,861	16,491	6,485	9,273	80	123	3,699	2,710
	Pacific	17,468	11,751	1,951	2,590	14	44	935	183
	Indian	14,137	2,920	2,611	4,379	35	67	2,048	2,077
	Atlantic	7,256	1,820	1,923	2,304	31	12	716	450
1968	Sub-total	76,704	25,823	12,520	27,354	319	148	6,134	4,406
	Pacific	20,061	11,976	2,246	4,217	77	55	1,135	355
	Indian	32,460	5,392	5,433	15,860	107	75	2,790	2,803
	Atlantic	22,182	8,385	4,441	6,529	134	5	1,760	928
	Taiwan[1]	2,001	70	400	748	1	13	449	320
1969	Sub-total	94,470	28,828	16,851	32,434	371	280	8,823	6,883
	Pacific	15,182	9,595	1,700	2,748	45	46	834	215
	Indian	41,848	7,490	7,240	18,425	126	167	4,309	4,271
	Atlantic	33,266	11,543	7,185	9,980	200	33	2,760	1,565
	Taiwan[1]	4,173	200	726	1,461	—	34	920	832

1 The landings in Taiwan were brought back by vessels operated in the three oceans.
2 In 1967 fish brought back by vessels from the three oceans included in separate oceans.
3 «Young tunas» consists of longtail and small yellowfin.

Oceanography, who had returned from several years of studying and working with the Fisheries Agency of Japan, was selected as the group leader. The primary purpose of the joint research group is to collect information on the activities of Taiwan's distant-water tuna fleet, and also to collect biological data for scientific evaluation of the abundance and dynamics of the tuna resources on various fishing grounds. This project is designed to help achieve proper management of Taiwan's tuna fisheries and also to contribute to the knowledge of the world's tuna resources.

The new project began officially in January 1970. The Institutes are responsible for collection of biological material, including biological statistics, gonads, stomachs, etc., and for analysis of this material. The Bureau is responsible for statistical surveys, including collection of data on catch and effort by the longline fleet, and analysis of these data. Species to be studied include albacore, yellowfin, bigeye, bluefin, and longtail tuna.