INTERNATIONAL COMMISSION

FOR THE

NORTHWEST ATLANTIC FISHERIES

REDBOOK 1963, PART I

STANDING COMMITTEE ON RESEARCH AND STATISTICS

PROCEEDINGS

1963

ANNUAL MEETING

Issued from the Headquarters of the Commission
Dartmouth, N. S., Canada

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From Serial Number 1146

REDBOOK 1963 appears in 2 parts

PART I	Proceedings of the Standing Committee on Research and Statistics
PART II	Reports on Researches in the ICNAF Area in 1962

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PART I. REPORT OF STANDING COMMITTEE ON RESEARCH AND STATISTICS

SECTION I.
SUMMARY REPORT OF STANDING COMMITTEE ON RESEARCH AND STATISTICS

by the Chairman, Mr.R.J.H.Beverton

1. INTRODUCTION

The 13th Annual Meeting of the Commission was held at Halifax, Nova Scotia. The Standing Committee of Research and Statistics met during the week 27th-31st May, preceded by separate meetings of Scientific Advisers to Panel 5 at Boothbay Harbour on herring research and of the Assessment Subcommittee at Halifax.

Thanks to the excellent service provided by the Executive Secretary (Mr. L.R.Day, who acted as Rapporteur to R & S) and his staff, and to the speed and efficiency with which the chairmen of subcommittees and working groups conducted their meetings and prepared their reports, nearly all the business of R & S was completed by the end of the first week. This made it possible to present a provisional R & S report to the first plenary session of the Commission; this report, with a few minor amendments and additions from the final meeting of R & S on 6th June, was subsequently approved by the Commission and is reproduced below in this Section I of the 1963 Redbook. Section II contains the detailed decisions and recommendations of R & S on matters of organisation and publications, while Section III comprises the reports of scientific subcommittees and working groups as approved by R & S except for minor editing. Included in Section III are also the proposed format for National Research Reports and a summary list of recommendations requiring action by member countries during the coming year.

All recommendations, scientific and administrative, are contained either in Section II or III, and for ease of reference are numbered serially throughout. There are four recommendations (Nos. 34, 35, 36 and 39) involving, explicitly, expenditure or Commission policy; these are identified by a double asterisk (**) and are mentioned also in this summary report.

Those who have followed the progress of R & S in recent years will find in the 1963 proceedings the culmination of several major projects and the initiation of new lines of co-ordinated research. Pride of place goes to Environmental Studies; the Environmental Survey got off to a good start in April and was in full swing at the time of the Annual Meeting, while plans for the Environmental Symposium to be held in Rome in January, 1964, are well advanced. Both these projects have involved a great deal of preparation during the past year, and I would like to express my appreciation of the efforts made by Mr.A.J.Lee and his colleagues in the planning of the survey and by Dr.C.E.Lucas and his conveners in connection with the symposium.

The question of Joint Statistical Reporting, which has taken so much of the time of the Statistical Subcommittee at the last two meetings, has at last been satisfactorily resolved, at least in principle, with agreement to make such minor changes to the format of the ICNAF Statistical Bulletin as are necessary to implement, in due

course, joint reporting on modified STANA 1W forms. The Assessment Subcommittee, concentrating on obtaining a better understanding of the long-term effects of fishing on the ICNAF fish stocks, have emphasised the need both for the development of new theoretical techniques and for a reappraisal of data requirements. While the first of these is essentially a matter for individual research, it is gratifying to see a new approach being made to the problem of age-reading co-ordination and to the techniques of biological sampling, including economy in presentation of sampling data in the Sampling Yearbook. New ground is being broken by bringing research on herring - now second among the ICNAF species with estimated 1962 landings in excess of 300,000 tons - within the normal scope of R & S, and by inviting contributions on the larger pelagic species.

Not the least of the new projects is the launching, in the coming year, of the ICNAF Research Bulletin, the purpose of which is to provide a proper scientific publication to take the many items of applied research on which, directly or indirectly, the scientific advice to the Commission is based, much of which has hitherto remained unpublished. The Research Bulletin will therefore be complementary to the Special Publication series which deals with symposia and special projects such as the Environmental Survey. The co-operation of scientists in all member countries is earnestly requested to make the Research Bulletin a worthy publication which will raise the scientific standards of the Commission.

I would like to conclude these introductory remarks by mentioning an informal scientific session which was held on the Friday morning of R & S week, during which talks were given by,

Dr. A.S. Bogdanov - on recent advances in Soviet research on redfish biology in the ICNAF area;

Mr. B.E. Skud - on plans for herring research in ICNAF Subarea 5;

Dr. B. Rasmussen - on the Norwegian fishery for porbeagle shark in the ICNAF area and first results of Norwegian research on this species (illustrated by a colour film), and

Dr. R. Trites (of the Bedford Institute of Oceanography) - who kindly came over from Dartmouth, Nova Scotia, to talk on his current measuring work in the Gulf of St. Lawrence.

I think it was generally agreed that this session provided a welcome break near the end of a necessarily somewhat arduous week of committee work, and it certainly gave the Executive Secretary and myself an opportunity to prepare for the afternoon session when all outstanding subcommittee reports had to be presented and approved. I personally believe that largely impromptu scientific discussions of this kind help to maintain the spirit of scientific endeavour in the work of R & S, and I hope that the programme will never again become so crowded as to prevent a little time being spent in this way.

2. ASSESSMENTS (App. I)

(a) Mesh Assessments

(i) During the year the Report of the Assessment Working Group was published as Supplement to Ann. Proc. Vol. 11. The Report of the Assessment Sub-committee approved by R & S at this meeting summarizes what has been done since 1961, including some items reported at the 1962 Annual Meeting.

(ii) No new long-term mesh assessments have been possible other than those relating to redfish in Divisions 3 NOP and silver hake in Subarea 5 reported in 1962 (App. I, p.35).

(iii) A technique has been devised for estimating the relative change in catch during the transitional period following the introduction of a mesh change and until the new long-term state is reached. This is described, with examples, in App. I, p.38.

(iv) No new information on the effect of catch size on selectivity has become available during the year which would permit a reappraisal of the effects of mesh size in the northern redfish fisheries where catches may be large. For cod and haddock, however, recent evidence suggests that this effect is unlikely to be of any practical significance so far as mesh assessments for these two species are concerned (App.I, p.40).

(v) As no new data on selectivity of sea scallops were presented to R & S, this subject was referred to Scientific Advisers to Panel 5 and is covered in their report.

(b) Catch/Effort Assessments

(i) Several lines of research are in progress or are planned on this problem. Recent examination of long-series catch and effort data for the cod and haddock fisheries of Subarea 5 leads to the conclusion that the present level of effort on cod is probably higher than that which would give the maximum sustained catch with a 4 1/2" mesh. For haddock the present levels of effort appear to provide landings near the sustainable maximum; further increases in effort would not, in the long run, increase the total landings and could cause them to decrease.

Note: This means that apart from these conclusions for Subarea 5, the best statement that can at present be made on the relation between catch and effort in the cod and haddock fisheries generally in the ICNAF area is still that given in the published Report of the Assessment Working Group (p.76), namely:-

> "...it can be taken as a rough guide that long-term catches would be rather insensitive to moderate changes in the amount of fishing, either upwards or downwards from the 1958 level."

The Assessment Working Group were, however, unable to establish the effect of fishing on the stocks of Subarea 2 where many of the fisheries are of fairly recent origin.

(c) Recent trends in ICNAF fisheries

These are reviewed on a subarea basis up to 1961, and in some cases up to 1962, in App. I, p. 25 . It is planned to develop a regular presentation along the lines of the "control chart" technique to enable recent trends in catch, catch/effort and effort to be shown graphically.

(d) Future research

Future research on fishery assessment, in relation both to catch/effort changes and to mesh effects, must centre around the rapidly changing pattern of many of the ICNAF fisheries. It calls for the development of new theoretical techniques for interpreting and predicting trends in fisheries of this kind, and for a reappraisal of the basic requirements of data, both of commercial fishing activities and biological sampling. While these are both tasks which depend essentially on individual research initiative and ideas, the Assessment Subcommittee will continue to stimulate and co-ordinate this research, and ensure that as new advances are made they are applied to ICNAF fisheries and the results brought to the notice of the Commission as soon as possible (App.I, p. 41 and 42).

3. MESH SELECTIVITY AND RELATED TOPICS (App.III)

(a) Chafing gear

A topside chafer described in the ICES Report of the Icelandic Trawl Mesh Selection Working Group (Doc. No.34) as "a modified form of ICNAF chafer" was used by the USSR Research Vessel GONCHAROV during the International Selectivity Experiment at Iceland in 1962 in which the R.V. A.T.CAMERON of the St.John's Laboratory of the Fisheries Research Board of Canada also participated. There was no evidence that this chafer influenced the selectivity of cod.

(b) Meshing of redfish

Some further evidence on redfish meshing was obtained by the German R.V. ANTON DOHRN as well as R.V. GONCHAROV during the Icelandic experiment. Further USSR work was undertaken early in 1963 and other existing data will be worked up for the next Annual Meeting.

(c) Mesh Gauges

The new ICES mesh gauge, which is now adopted as standard for research purposes in the ICNAF area, has only recently been obtained from the

manufacturers. Although some preliminary trials have been made, further experience is necessary before the Commission can be advised of its performance relative to that of the ICNAF gauge.

(d) Selectivity of natural and synthetic twines

From experiments conducted in the ICNAF area an analysis has been made of the differences between the selectivity of natural and synthetic twines (Doc. No. 35). Selection factors for the main types of double-braided polyamide (nylon, etc.) and polyester (terylene) fibres were found to be some 12-20% higher than those of double manila fibres of the same mesh size; in this respect the findings are broadly comparable to those obtained in the Northeast Atlantic. Noting the general increase in the use of synthetic materials in the ICNAF area, countries are recommended to undertake further experiments of this kind.

4. ENVIRONMENTAL STUDIES (App. V)

(a) Environmental Symposium (App. V. p. 56)

(i) Plans for this Symposium, to be held in Rome from 27th January-1st February, 1964, are in an advanced state of preparation. It promises to be of outstanding value in drawing together a wide range of contributions dealing with the influence of environmental factors on the abundance and distribution of fish stocks and the success of fishing operations. Some idea of the scope of the Symposium can be judged from the information in the annex to Appendix

(ii) At this meeting it was decided to add another section to the Symposium on "ICNAF Herring and the Environment" to be convened by Mr. B. E. Skud. This should prove of direct value to the joint research programme on herring now being started in Subarea 5.

(iii) It was recommended at the 1962 Annual Meeting (1962 Redbook, p. 8) that a sum of $4000 be set aside in the financial year 1963/64 to cover the travel and subsistence expenses of the Chairman of the Symposium, Conveners and Special Lecturers, although it is hoped that in most instances their expenses will be covered by their governments. While there is as yet no certainty on this latter point, so far there are only one or two instances in which it is known that the governments concerned are unlikely to cover the expenses. There remains, however, (a) the additional expenses the Secretariat will incur in duplication of contributions, etc., and (b) the incidental expenses which may be incurred in Rome over and above those covered by the hospitality of FAO. It is accordingly

recommended (34)**

that the sum of $4000 be retained in the estimates for 1963/64 to

cover these expenses in addition to the probably reduced expenditure on travel etc.

(iv) R & S stress the importance of all contributors being enabled to attend the Symposium, and respectfully urge this need once again to all Commissioners so that requests for attendance should be received by governments with the maximum favour.

(v) Estimated expenditure for publication of the proceedings of the Symposium is dealt with in para. 8 (c) of this report.

(b) Environmental Survey (NORWESTLANT) (App.V, pp.58-60)

(i) The first stage of this project, the general aims and plans of which are set out in the 1962 Redbook, p.23 et. seq., has been successfully carried through in April-May of this year by the research vessels of France, Norway, UK and USSR. The second stage, involving vessels of Canada, Denmark, Germany and Iceland is now in progress, and the third and last stage is planned for July.

(ii) R & S are convinced of the need for the results of this unique environmental survey to be worked up and published as soon as possible. The tasks have accordingly been allocated among participating countries. Publication of results is dealt with in para. 8 (d) of this summary report and in App. V of Section III.

(iii) The Commission will wish to know of the generous offer from the Canadian Oceanographic Data Centre (CODC) to process by automatic methods all of the hydrographic data collected on this survey.

(c) Relations with other international bodies

(i) In response to ICNAF's letter of 7th September, 1962 (1962 Redbook, p.20) the Intergovernmental Oceanographic Commission (IOC) at its meeting last September, welcomed ICNAF's environmental programme and recommended that members of IOC concerned with this area give it all possible assistance. The IOC Secretariat was requested to keep ICNAF informed of any proposals for oceanic research covering or overlapping the ICNAF area.

(ii) At the same conference IOC arranged to invite intergovernmental regional fisheries bodies to participate in the meetings and to propose items for their agenda.

(iii) R & S noted that the Director General of FAO had convened, early in 1963, the first meeting of the newly-formed FAO Advisory Committee on Marine Resources Research (ACMRR), whose activities will be of direct interest to much of the work of the Commission and, in

particular, that of R & S. Members of the ACMRR are appointed on a personal basis, but it is gratifying to note that the Chairman (Dr.A.W.H. Needler), Vice-Chairman (Dr.C.E.Lucas) and the Secretary (Dr. M. Ruivo) of ACMRR are all past Chairmen of the Research and Statistics Committee of ICNAF.

(iv) Dr. M. Ruivo, present at the 1963 Annual Meeting of R & S as FAO Observer on biological matters, requested assistance from ICNAF experts in the preparation of synopses on haddock and halibut. Dr.H.W.Graham (USA), Dr.A.S.Bogdanov (USSR), Dr. J. Hart (Canada), Dr. W. Templeman (Canada) and Dr.C.E.Lucas (UK) agreed to assist FAO, in the first instance.

5. STATISTICS (App. VI)

(a) Species order and joint reporting (App. VI, p.70-73)

(i) R & S agreed that some revision of the sub-grouping of species in the ICNAF Statistical Bulletin should be introduced, similar to that proposed by the Joint ICES/ICNAF/FAO Continuing Working Party (CWP) at its meeting in Rome last March (Doc. 11), where ICNAF was represented by the Statistician and the Chairman of the Statistical Subcommittee (Mr. Hennemuth). It was recognized that some further time and study is needed to implement this course of action.

(ii) All European countries signified their wish to use the joint reporting form STANA 1W. It was accordingly arranged that they may do so. The species grouping on the form STANA 1W will follow that of the revised list in the CWP report, as further amended at the present meeting, which includes also the various sub-totals required for the ICNAF Statistical Bulletin. Meanwhile, in order not to increase the work of either Canada or the ICNAF Secretariat, it was agreed that Canada and the U.S. will continue for 1963 to use the present ICNAF reporting forms.

(iii) Joint ICES/ICNAF/FAO Continuing Working Party (CWP)

Now that the development of joint reporting has been largely completed, R & S considered the future functions and status of the Continuing Working Party, set up by the Director General of FAO to implement the recommendations of the 1959 Edinburgh Conference on Statistics, and accordingly

recommends (59)** that

(a) the CWP should remain in existence, as being the best means of providing the essential liaison between the three international agencies (ICES, ICNAF, FAO) responsible for compiling and publishing North Atlantic fishery statistics;

(b) the interests of ICNAF would be best served if the composition of the CWP included one member of each of the Secretariats of ICNAF and ICES, and the Chairmen of the Statistical Committees of the two agencies;

(c) since the initial trials of common reporting forms by the four "guinea-pig" countries (Canada, Germany, Iceland and UK) have now been completed, the continued participation of these four countries was perhaps no longer necessary;

(d) in order to maintain effective collaboration between the three agencies concerned with fishery statistics in the North Atlantic, the activities of the CWP should continue to be confined to this region;

(e) these views, if approved by the Commission, be transmitted to ICES and FAO with the request that their views be made known to ICNAF.

Note: R & S recognized that under these terms of reference the expenses of the ICNAF representatives on the CWP would be paid by ICNAF. The next meeting of the CWP is planned for 1965, the proposed agenda for which will be available for consideration by R & S at its 1964 Annual Meeting.

(b) Other statistical matters (App. VI, pp.65-70)

(i) R & S endorsed a number of recommendations of its Statistical Subcommittee concerned with improving the standard of reporting and the presentation of data in the Statistical Bulletin. These are set out in detail in App. VI.

(ii) R & S again noted with regret the lateness with which the 1961 statistics from some member countries were submitted, and also that a number of member countries have not yet supplied preliminary data for 1962.

6. OTHER SCIENTIFIC MATTERS

(a) Ageing Techniques (App. II)

(i) An Ageing Techniques Workshop was held last November in Bergen, attended by a number of age-reading experts from member countries. R & S expressed its gratitude to the Norwegian authorities for their hospitality and to Dr. B. Rasmussen for acting as Convener.

(ii) Certain important age-reading problems arising in studies of the stocks of the ICNAF area were resolved, and new techniques of otolith

preparation and photography were demonstrated. These make possible a new approach to the urgent need for better co-ordination between age-readers, and plans have been made to set up a new system of age-reading exchange by means of otolith photographs (both prints and transparencies).

(b) Tagging (App. IV)

(i) Publication of the 1961 ICNAF Tagging Symposium is now nearly at the end of the second proof stage, and it should be issued shortly.

(ii) The postcard system of reporting release data in summary form introduced by ICNAF last year has also been adopted by ICES; thus the whole of the North Atlantic is now covered.

(iii) Further steps have been taken to improve the standard of recovery of tagged fish and sea-bed drifters (see App. V), and to make detailed plans of tagging operations in the ICNAF area known to member countries as soon as possible.

(c) Sampling (App. VII)

(i) Studies on ways and means by which the growing (but most welcome) volume of biological sampling data may be condensed without loss of essential information have been undertaken, and more are projected in the coming year.

(ii) Meanwhile, in the interests of economy, it is proposed to continue to retain age-length keys at the Secretariat. It was agreed, however, that these are vital data and that every attempt should be made to reintroduce them in the Sampling Yearbook when sufficient condensation has been achieved.

7. ORGANIZATION OF THE RESEARCH AND STATISTICS COMMITTEE

(a) Action Committee

(i) Believing that the functions of the Action Committee (which now include publications policy) and its status are not properly described by the present name of this Committee, R & S have recommended that henceforward it shall be called the

"Steering and Publications Subcommittee"

(ii) Poland, being now a member country of ICNAF, is included with the group Denmark, Germany and U.K., who together have one representative on the Steering and Publications Subcommittee.

(iii) R & S recommend that the scope of the Gear and Selectivity Subcommittee could usefully be extended to include information and contributions on the design, performance and selectivity of all kinds of fishing gear and associated equipment (e.g. echo-sounders) in commercial use in the ICNAF area.

(iv) Noting the growing commercial and research interest in herring and in larger pelagic fish (swordfish, tuna, sharks) etc. in the ICNAF area, R & S recommends that herring matters be henceforth included within the normal scope of R & S and that contributions be invited on the larger pelagic fish.

(v) To preserve the necessary continuity of work and leadership, a number of subcommittees and chairmen for them have been appointed to function during the coming year and at the next Annual Meeting. Details of officers and representatives at other international meetings will be found in Section IIB, paras. 7 and 8.

8. PUBLICATIONS

(a) ICNAF Research Bulletin

(i) Although initiation of an ICNAF Research Bulletin was approved by the Commission at its 1962 meeting (Ann. Proc. Vol. 12, p.14), and funds for it were provided in the 1962/63 estimates, it proved impossible at the time to make the necessarily detailed plans for launching the Bulletin in 1962.

(ii) Accordingly, permission was obtained later from the Commission's Chairman to use the 1962/63 appropriation to publish the selectivity papers from the 1957 Special Meeting in Lisbon as ICNAF Spec. Pubs. No.5. These are now in proof stage.

(iii) At this meeting firm plans have been made to proceed with the Research Bulletin during the coming year, with the Executive Secretary as Editor assisted by the Chairman of R & S and the Action Committee. These are set out in Section IIC, para. 1. About 18 papers, mostly originating in documents submitted to this meeting but including some others either inspired by or of direct relevance to ICNAF, have been earmarked for the first number.

(iv) To ensure that the scientific publications of the Commission are of as high a standard as possible, R & S recommend that all contributions to the Research Bulletin shall be submitted to one or more of a panel of expert referees. The same procedure shall apply to the Special Publications Series at the discretion of the editor in question.

(b) Other Regular ICNAF Publications

(i) National Research Reports and Summaries of Research

One of the economies which the Commission required R & S to make to provide the necessary funds for the Research Bulletin was to publish

national Research Reports in extenso in the Redbook and only summaries of research on a subarea basis in the Annual Proceedings. While not necessarily believing this to be an ideal arrangement, R & S are mindful of their responsibility for making all reasonable economies which do not lower the standard of the Commission's scientific work. R & S have accordingly recommended that the Summaries of national Research Reports for publication in the Annual Proceedings should be kept as brief but informative as possible, and that countries should be encouraged to submit the detailed results of special researches as separate Meeting Documents rather than in national Research Reports wherever feasible. A standard format for National Research Reports is also proposed (see Section III, App. VIII).

(ii) Redbook and Sampling Yearbook

It is anticipated that the section of the Redbook devoted to the publication of scientific papers will be substantially reduced now that the Research Bulletin has been started. As stated in para. 6 (c) studies are being undertaken to see whether further economies in the size of the Sampling Yearbook are possible.

(c) Publication of the ICNAF Environmental Symposium

The Commission approved in principle at its 1962 meeting that funds be made available in due course for publishing the contributions to the Symposium and any reviews etc. which are worthy of publication (1962 Redbook, p.23). While it is still impossible to estimate the costs of publication with accuracy, it is

recommended (35)**

that the contributions to and proceedings of the Environmental Symposium be published in the ICNAF Special Publications Series (large size), and that a sum of $7,500 should be allocated in the first place, for the financial year 1964/65.

(d) Publication of the results of the ICNAF Environmental Survey

R & S believe it is important that the main results of this survey be published by ICNAF. It is accordingly

recommended (36)**

that the main results of this survey shall be published in the ICNAF Special Publication Series (large size, with provision for maps and diagrams). It is intended that the publication date shall be in 1965/66.

SECTION II.
GENERAL AND ADMINISTRATIVE

A. AGENDA OF THE RESEARCH AND STATISTICS COMMITTEE FOR 1963

1. Introduction

   (a) Opening of Meeting
   (b) Appointment of Rapporteur
   (c) Planning of work of Committee, its Subcommittees, Working Groups, and Scientific Advisers to Panels.

2. Reports by Scientific Advisers to Panels, with consideration of their contents so far as these concern the whole Committee.

3. Review of the Commission's research programs with a view to making best use of all research vessels in the area.

4. Gear and Selectivity (Chairman, W. F. Templeman)

   (a) Compilation of mesh selection data; data on synthetics (B. B. Parrish to compile).
   (b) Experience of use of ICES gauge.
   (c) Compilation of weight, length and girth data.
   (d) Studies on the relation between selectivity and catch size for redfish and other species.
   (e) New information on meshing of redfish, if forthcoming.
   (f) Report on the Selectivity Experiment at Iceland.
   (g) Selectivity of Sea Scallops.
   (h) Major new developments in kind and use of fishing gear.
   (i) Variability of Selection factor and Selection range.

5. Assessments and Sampling (Chairman, L. M. Dickie)

   (a) Clearance of 1962 Report.
   (b) Review of recent trends in subarea fisheries.
   (c) Report on special problems; including effects of revised cod and redfish selectivity, and long-term assessments for haddock and redfish.
   (d) Fishing effort and catch per unit effort studies.
   (e) Sampling, including adequacy of present programme and publication in the Yearbook.

6. Environmental Studies (Chairman, C. E. Lucas)

   (a) Introductory.
   (b) Reports on environmental work in the Commission's area during 1962/63.
      (i) Interim report on the conjoint survey.
      (ii) National reports.

6. Environmental Studies (cont'd)

   (b) (iii) Continuous Plankton Recorder programme.
   (iv) Other aspects of the ICNAF environmental programme approved in 1961.
   (c) Progress report and final planning for the Environmental Symposium.
   (d) Relationships with other bodies (ICES, FAO, IOC, Data Centres, etc.).
   (e) Other business.

7. Statistics (Chairman, R.C.Hennemuth)

   (a) Review of changes in Statistical Bulletin made at 1962 Annual Meeting and consideration of possible improvements to the usefulness of the Bulletin.
   (b) Report from March meeting of the Continuing Working Party, and matters arising therefrom concerning joint reporting procedures and species order.
   (c) Consideration of a method for utilizing ICNAF Statistics Form 3 (Statistics on Fishing Effort).
   (d) Discards.
   (e) Fishing power studies, including List of Vessels publication.
   (f) Means of achieving earlier distribution of ICNAF statistics.

8. Ageing Techniques (Chairman, B. Rasmussen)

   (a) Report of Ageing Techniques Workshop held in Bergen, November, 1962.
   (b) Matters arising therefrom, including means for achieving better international co-ordination of age-reading techniques and criterea by otolith exchange and other methods.
   (c) Review of discrepancies in age-determination in relation to presentation of data in the Sampling Yearbook (Chairman's letter of 22nd February, 1963).

9. Tagging (Chairman, S. Horsted)

   (a) Consideration of the recently introduced card-system for reporting of tagging experiments.
   (b) Other matters.

10. Recommendations from Action Committee

   (a) Publications, including changes to content of Annual Proceedings and Redbook decided at 1962 meeting and plans for the proposed ICNAF Research Bulletin.
   (b) Other matters.

11. Co-ordination with other organisations, including report from ICNAF observer to ICES.

12. Approval of reports of Research and Statistics Committee and its Subcommittees and Working Groups.

13. Election of officers for ensuing year.

14. Other business.

B. ORGANISATION OF R & S

1. Change of name of Action Committee

R & S is of the opinion that the name "Action Committee" does not properly describe either its functions or status. Its functions are essentially those of advising and assisting the Chairman of R & S as a steering group for annual meetings of R & S, to which has been added in recent years responsibility for that part of the publications policy of the Commission which falls within the competence of R & S. Since all proposals and recommendations from the Action Committee have to be presented and approved by a plenary session of R & S before they can be submitted to the Commission, its status in this respect is comparable to that of the other technical and scientific subcommittees and working groups of R & S. Accordingly, R & S

recommends (1)

that from henceforth the name "Action Committee" shall be changed to "Steering and Publications Subcommittee".

Explanatory Note:

The composition and terms of reference of the Action Committee are set out on p. 39 of the 1958 Redbook, and on p. 14 of the 1960 Redbook. Except for the proposal to include Poland as noted in para. B.2 below, these remain valid at the present time.

2. Composition of Steering and Publications Subcommittee

Poland is now a member of the Commission and must therefore be represented on the Steering and Publications Subcommittee. R & S accordingly

recommends (2)

that Poland be included with the group of countries comprising Denmark, Germany and the UK (see 1962 Redbook, p.6). Thus the new composition of the Steering and Publications Subcommittee, and representatives for the current meeting, would become:-

France, Portugal, Spain, Italy	- Dr. Rodriguez-Martin
Iceland, Norway, USSR	- Dr. B. Rasmussen
Denmark, Germany, UK, Poland	- Dr.C.E.Lucas
Canada	- Dr.W.R.Martin
USA	- Dr.H.W.Graham

together with the Chairman of R & S and the Executive Secretary.

3. Terms of reference of the Gear and Selectivity Subcommittee

R & S

recommends (3)

that the scope of the Gear and Selectivity Subcommittee could usefully be extended to include information and contributions on the design, performance, and selectivity of all kinds of fishing gear and associated equipment (e.g. echo-sounders) in commercial use in the ICNAF area. Since such topics are also relevant to certain other Subcommittees (e.g. Statistics) it requests the Gear and Selectivity Subcommittee to bear in mind the need for co-ordination with other committees when dealing with such topics.

4. Extension of R & S interests

(a) Herring research

In view of the growing commercial and research interest in herring in the ICNAF area, and having regard to the views expressed by the Scientific Advisers to Panel 5 in this connection, R & S

recommends (4)

that the status of the herring fisheries and stocks of the ICNAF area, and the co-ordination of research on herring among member countries, be henceforth included within the normal scope of R & S.

(b) Larger pelagic fish

Noting the increasing international interest in the larger pelagic fish (swordfish, tuna, sharks, etc.) in the ICNAF area, and the expanding fisheries for them, R & S

recommends (5)

that contributions relating to these species be invited from scientists of member countries for the next annual meeting, and that opportunity be provided for discussion of them.

5. Status of R & S Subcommittees for 1963/64

(a) Having reviewed the various proposals for work to be undertaken during the coming year and at the next annual meeting (see Section III), R & S

recommends (6)

that the four subcommittees appointed in readiness for the present meeting should continue until the end of the 1964 Annual Meeting; these subcommittees being:

Assessments
Environmental Studies
Statistics
Gear and Selectivity

(7)

that the hitherto ad hoc groups responsible for

Ageing Techniques and
Sampling

be also treated as subcommittees to function during the coming year and at the 1964 Annual Meeting;

(8)

that chairmen for all these six subcommittees be appointed at the present meeting.

6. Arrangements for 1964 Annual Meeting

In addition to meetings of the six subcommittees listed in para. 5 above, time will also be needed for meetings of ad hoc groups on Tagging and Herring, the former to be convened by Mr. Sv. Aa. Horsted and the latter to be convened by Mr.B.E.Skud. Convinced of the importance of completing all the scientific work of R & S by the end of Friday of R & S week, R & S

recommends (9)

that the Assessment Subcommittee and the ad hoc Group on Herring should meet on the Friday and Saturday immediately before R & S week. They should endeavour to complete their work during this time and to arrange for a joint session to review problems of mutual interest.

7. Officers for 1963/64

(a) Subcommittee Chairmen

The following were elected to serve for the coming year and at the 1964 Annual Meeting:-

Assessments	Dr.L.M.Dickie
Environmental Studies	Dr.C.E.Lucas
Statistics	Mr. R. Hennemuth
Gear and Selectivity	Dr.W.F.Templeman
Ageing Techniques	Dr. B. Rasmussen
Sampling	Mr.B.B.Parrish

(b) Representatives on the Steering and Publications Subcommittee for 1964 are:

France, Portugal, Spain and Italy	- Dr. Rodriguez-Martin
Iceland, Norway, USSR	- Dr.A.S.Bogdanov
Denmark, Germany, Poland and UK	- Dr.C.E.Lucas
Canada	- Dr.W.R.Martin or Dr.W.F. Templeman
USA	- Dr.H.W.Graham

(c) Chairman of R & S

Mr.R.J.H.Beverton was re-elected Chairman of R & S for the coming year.

8. ICNAF representatives at other international meetings

Representatives for 1963/64 were nominated as follows:-

(a) ICES Mr.R.J.H.Beverton

(b) IOC Dr.C.E.Lucas

C. PUBLICATIONS

1. ICNAF Research Bulletin

(a) At the 1962 Annual Meeting the following recommendation was made by R & S and approved by the Commission (1962 Redbook, p.12):-

"(i) that ICNAF should initiate a new publication to be called 'The Research Bulletin of ICNAF';

(ii) that the main purpose of the Bulletin should be for the publication of the results of research carried out in the ICNAF area. It is expected that most of the papers published in the Bulletin would be selected from texts presented at Annual Meetings; but other papers, either concerning the ICNAF area or outside it, would be accepted if their contents were of importance to the work of the Commission;

(iii) that the Editor of the Research Bulletin should be the Executive Secretary, assisted by one or more technical consultants. Editorial policy would be determined, at least for the time being, by the Action Committee who, together with the Executive Secretary, would constitute the Editorial Board."

(b) In the time available at the 1962 Annual Meeting, it was not possible to make the necessary detailed arrangements for initiating the Research Bulletin for 1962. Instead, special permission was sought later from the Commission Chairman to use the funds set aside in the financial year 1962/63 for the Bulletin to publish the selectivity papers from the 1957 Special Meeting at Lisbon. These are now in press and will appear shortly as ICNAF Special Publication No. 5. Meanwhile, it is essential that firm plans be made at this meeting to proceed with the Research Bulletin. R & S therefore believe it is necessary to restate and extend the 1962 recommendations concerning the editorial arrangements for the Bulletin. R & S accordingly

recommends (10) that

(a) the Editor of the ICNAF Research Bulletin will be the Executive Secretary. He will be assisted on matters of editorial policy (i.e. on the choice of papers suitable for the Bulletin) by the Chairman of R & S and the S & P Subcommittee;

(b) in order to maintain a high standard of publication each contribution should be submitted by the Editor to one or more referees from a panel of experts appointed for that purpose. On the advice of the referee(s) the Editor is empowered to request the author to make such amendments to his manuscript as may be required or to reject it;

(c) the final date for submission of manuscripts be 1st October. This should provide authors with sufficient time to revise or extend papers submitted or solicited at the previous Annual Meeting while also providing the possibility that the Bulletin can be issued before the next Annual Meeting;

(d) the Editor should draw up instructions to authors for preparation of manuscripts for the Bulletin so designed as to achieve the

maximum conformity in presentation and to minimize the typing and other editorial work falling on the ICNAF Secretariat.

Note: At a special meeting of the Standing Committee on Finance and Administration, on 7th June, 1963 (Proc. No. 16) which the Chairman of R & S also attended, it was agreed, having regard to the present financial position of the Commission, to postpone publication of the first number of the ICNAF Research Bulletin until the beginning of the financial year 1964/65, i.e. until July, 1964. Preparation of the first number of the Bulletin will, however, proceed as planned.

2. ICNAF Special Publications

R & S

recommends (11)

that the principle proposed in recommendation (10b) above concerning the submission of papers for the Research Bulletin to expert referees should also be extended to all papers published in ICNAF Special Publications. The Editor of Special Publications Series, whoever he may be, is accordingly empowered to proceed in this way at his discretion.

3. Summaries of Research

One of the economies which the Commission at its 1962 Annual Meeting required R & S to make to provide the necessary funds for the Research Bulletin was to publish national Research Reports in the Redbook and only summaries of research on a subarea basis in the Annual Proceedings. While not necessarily believing this to be an ideal arrangement, R & S recognize that it has a responsibility for making all reasonable economies which do not lower the standard of the Commission's scientific work. With this in mind R & S

recommends (12)

that summaries of research by subareas for inclusion in the Annual Proceedings should be as informative as possible while at the same time keeping their length to a minimum. They should be based on the summaries prepared by Chairman of Panel Advisers, though it is recognized that a little time may be required after the Annual Meeting for revised and comprehensive drafts to be prepared.

4. National Research Reports

To ensure that scientific findings may be brought to the notice of the appropriate R & S Subcommittee with the maximum effect, and to ease the task of Chairman of Scientific Advisers when preparing their Summaries of Research for presentation to Panel Commissioners, R & S

recommends (13) that

(a) attention of all members be drawn to the recommendations concerning the function and content of national Research Reports passed at the 1962 Annual Meeting (1962 Redbook, p.13); in particular, that the detailed reporting of particular scientific work, concerning both fish and environment, would be more appropriate as separate Meeting Documents than in Research Reports. The fact that ICNAF now has its own Research Bulletin means that there is now a proper scientific publication to take such contributions if of sufficient standard, which has not hitherto been available;

(b) the proposed format of national Research Reports, as set out in Section III Appendix VIII, be adhered to by member countries as far as possible; and

(c) member countries make every effort to submit their reports by the recommended date (31st March) or, failing that, so as to reach the Secretariat by 30th April at the latest.

5. Standard Units of Measure for ICNAF Documents and Publications

Noting the lack of consistency in the units of depth, weight, and mesh size, and so forth, used by member countries in reporting to the Commission, R & S accordingly

recommends (14)

that in all meeting documents and Commission publications the metric system and Celsius scale should be used as a standard. Where other units of measure are preferred, authors are requested to include equivalents in metric units.

D. ICNAF SECRETARIAT

1. R & S notes that it has been the policy of the Commission in the past to arrange for the Executive Secretary to visit member countries. R & S therefore respectfully draws the attention of the Commission to the fact that the forthcoming Annual Meeting of ICES in Madrid next October and the ICNAF Environmental Symposium in Rome in January, 1964, might provide a good opportunity for the present Executive Secretary both to visit member countries and to make contact with the Secretariats of ICES and FAO.

2. R & S has been noting with growing concern the increasing burden of work falling on the ICNAF Secretariat, particularly in relation to publications and statistics. As a consequence, R & S believes that the professional training

and experience of both the Executive Secretary and the Statistician are not being utilized to the best advantage of ICNAF. R & S therefore respectfully requests that, noting recommendation 4 of the Report of the 2nd meeting of the Standing Committee on Finance and Administration (Ser. No. 1039, 1962), the Commission now give this matter their urgent consideration.

[Note: At the meeting of the Standing Committee on Finance and Administration (Proc. No. 16) referred to under para. C.1 above it was recommended, in the interests of economy, that (a) the Executive Secretary attend the Environmental Symposium in Rome in January, 1964, but not ICES in October, 1963, and (b) an additional member of the Secretariat staff be recruited as from 1st October, 1963.]

SECTION III.
REPORTS OF SCIENTIFIC SUBCOMMITTEES AND WORKING GROUPS

APPENDIX I - REPORT OF THE ASSESSMENT SUB-COMMITTEE

Dr. L. M. Dickie, Convenor

I. Introduction

This report covers the work of the Assessment Group since 1961 and at the two annual meetings of 1962 and 1963 (see Annex 1 for list of participants). It incorporates the substance of a progress report circulated in November, 1962 (Serial No. 1043) and should be read against the background of the first full Report of the Working Group on Fishery Assessment which has now been published as a supplement to Annual Proceedings Volume 11. The studies undertaken during 1960 and 1961 on which the published report was based used information available up to the end of 1958. The work involved the assembly of the great bulk of information in ICNAF fisheries which had been gathered by the Commission and its member countries. The information was used to give estimates of the effects of the fishery on stocks, and to choose an average or "representative" condition from which to estimate the advantages of the use of mesh sizes as a method of regulating the fisheries and maintaining a high long-term yield.

The first report of the Working Group stressed the fact that the assessments were for current levels and patterns of fishing. Strictly speaking, the applicability of the results depends on the stability of the past fishing patterns. Many of the fisheries are, however, undergoing important changes. These are reflected in new types of gear and vessels and in shifts in the times and places of fishing. In addition, there is a tendency towards increased fishing effort in the whole area. The present work of the Assessment Subcommittee is therefore directed mainly towards obtaining a better understanding of how the assessments will be affected by the changing fishing conditions.

II. Reviews of Recent Fishery Changes by Subarea

A. Subarea 1.

The landings of cod and redfish from the subarea by countries in years 1959-1961 and provisional data for 1962 are tabulated in Table 1 together with averages for 1957-58.

Cod:

These data show that the total cod landings from the subarea decreased in 1959 and 1960 to about 20% below the 1957/58 level, but they increased again in 1961 to 17% above the 57/58 level (42% above 1960). In 1962 the provisional figures indicate a further increase (probably to about 400,000 tons).

The most striking changes are the marked decrease in the Portuguese and Spanish otter trawl fisheries together with a great increase in the German fisheries in both 1961 and 1962. These changes are mainly due to a drop in the Portuguese and Spanish effort and a marked increase in the German effort.

The catches in the line and trawl fisheries of other countries fluctuated widely from year to year, but the tendency in 1962 is an increase in landings for all countries hitherto reported.

TABLE 1. SUBAREA 1: LANDINGS OF COD AND REDFISH (THOUSANDS OF METRIC TONS)

COUNTRY		DENMARK G*	DENMARK F*	FRANCE	GERMANY	ICELAND	NORWAY	POLAND	PORTUGAL DV	PORTUGAL OT	SPAIN	UK	USSR	TOTAL
COD	1957/58*	26	38	25	20	10	28	-	72	40	25	10	+	294
	1959	27	38	30	17	1	27	-	50	17	14	12	+	233
	1960	27	50	21	24	5	32	-	59	7	4	12	+	241
	1961	34	56	40	84	11	44	-	66	2	1	8	+	345
	1962	36	( )	( )	(116)	1	34	( )	81	11	( )	15	+	(400)
REDFISH	1957/58*	+	-	-	14	8	-	-	-		-	+	+	22
	1959	+	-	-	19	12	-	-	-		-	+	+	33
	1960	+	-	-	21	21	-	-	-		-	+	+	44
	1961	+	-	-	46	8	-	-	-		-	+	+	54
	1962	+	( )	( )	(60)	( )	-	+	-		( )	1	+	(61)

* AVERAGE ( ) NOT YET REPORTED OR PROVISIONAL * G = GREENLAND; F = FAROES

TABLE 2. SUBAREA 2: LANDINGS OF COD AND REDFISH (THOUSANDS OF METRIC TONS)

COUNTRY		CANADA M	CANADA NFLD.	FRANCE M	GERMANY	ICELAND	POLAND	PORTUGAL	SPAIN	USSR	UK	USA	TOTAL
COD	1957/58	+	12	15	+	+	-	8	1	+	-	-	36
	1959	-	19	24	3	+	-	7	6	+	+	-	60
	1960	-	17	46	12	+	-	44	30	39	+	-	189
	1961	-	19	36	11	-	+	46	41	110	1	-	264
	1962	-	25	( )	( )	-	1	63	( )	60	( )	-	(149)
REDFISH	1957/58	3	1	-	12	33	-	-	-	13	-	2	64
	1959	-	-	-	42	9	-	-	-	2	-	-	53
	1960	-	+	-	32	5	-	-	-	47	+	-	84
	1961	+	-	-	8	+	+	-	-	17	+	-	25
	1962	-	-	( )	( )	-	+	-	( )	6	( )	-	(6)

The landings per unit effort has generally been decreasing up to 1961. From 1961 to 1962 the landings per effort in the long line fisheries has still been decreasing (Norway), while the catch per effort in the trawl fisheries in 1962 probably is nearly the same as in 1961 (UK Research Report).

The biological data available up to 1961 reveal no marked changes in length- or age-compositions from those used in our earlier assessments.

In 1962 the fisheries have been based mainly on two year-classes, namely the 1956 and 1957 year-classes. In the Divisions B, C and northern part of D, the 1957 predominates, while the 1956 predominates in southern D, E and F. The fisheries in 1963 are expected to be based on the same year-classes as in 1962, and therefore we may expect a slight increase in the mean length in the catches. The present material does not indicate any rich year-class younger than 1957. No changes in assessments have been made.

Redfish:

The catches of redfish in the subarea, principally by Germany and Iceland, increased in 1959 and 1960 to twice the 1957/58 level. In 1961 the total catch increased again by about 10,000 tons. In 1962 again the catch increased and is now about three times the 1957/58 level.

Catch per effort fluctuates widely and provides no clear evidence of a general decrease in stock abundance. Further, no major changes in the size compositions are evident from data available.

Attention is drawn to papers (1963 Document No.20, 55, 59) showing the presence of pelagic stocks of redfish to the south and east of Greenland, but further investigations are necessary to know anything about the possible influence of these on the recruitment to the West Greenland stock. Attention is also drawn to the Sections III A and D of this report which deal with questions of transitory stock compositions and changes in codend selectivity with increasing catch size. At the present stage it is not possible to modify or extend the earlier assessments for redfish in this subarea.

B. Subarea 2.

The landings for cod and redfish for Subarea 2 in 1959-61 and provisional figures for 1962 are given in Table 2, together with the averages for 1957-58 used in the Assessment Report.

Cod

Cod landings increased greatly after 1958, to reach in 1961 a value approximately seven times the 1957-58 level. This was due to a large increase in fishing effort by European trawlers (notably Portugal, Spain, France and USSR). Data of landing per unit effort for the Portuguese trawl fleet show an increase from an average of 1.0 tons per hour fished in 1958 to 1.3 in 1959 and 2.0 in 1960. However, in 1961 there was a decrease to

1.6 tons per hour. As for cod in the northern parts of Subarea 3, the fishing prior to 1958 occurred in the September-December period, and considering this period up to 1960 there has been a gradual decrease in the landings per unit effort from about 1.7 tons per hour for 1954-56 to 1.3 in 1960. Since 1959 most of the fishing has occurred in the first half of the year on newly-discovered spawning concentrations and the increased landings per unit effort given above are due mainly to the recent very productive exploitation of these cod concentrations. (For example, in 1960, landings per hour averaged 3.4 tons in the April-June period.) This fishery occurs in the early months of the year, and, according to observations carried out by the USSR, the distribution and degree of concentration of cod and the results of fishing depend to a considerable extent on hydrological conditions but mostly on ice conditions which at times prevent trawlers from fishing on the best concentrations.

With the statistical and biological data available it is not yet possible to demonstrate the effect of an increase in fishing on the cod stocks in the subarea, nor to obtain more reliable estimates of the main population parameters than were previously available. However, in view of the large and rapid increase in fishing in this subarea, it is important that close attention should be given by countries engaged in fishing there to the collection of statistical data on the developments of this fishery and to the collection of biological data (especially size and age compositions) from which more detailed assessments of the effects of fishing and of changes in mesh size can be made.

Redfish

Total redfish landings decreased somewhat in 1959 but increased again in 1960 to 84 thousand tons, some 30% above the 1958 level. In 1961 only 25 thousand tons were landed and, when complete data for 1962 are available the landing for that year may be considerably less. The USSR and Germany have taken most of the redfish from this subarea. The landing per unit effort for German trawlers increased slightly to 38.4 tons per day in 1959 (36.8 in 1958) but decreased substantially to 26.7 tons in 1960.

No modifications of the assessments can as yet be made from the data available. However, attention is drawn to sections dealing with transitional fish stock conditions (Section IIIA) and with codend selectivity (Section IIID).

C. Subarea 3.

Cod

Table 3 gives the landings of cod by countries, and divisions for 1959 to 1962, together with averages for 1955-58. There has been an increase in landings from an average of 390 thousand tons in 1955-58 to 471 thousand tons in 1960 and a slight decrease to 460 thousand tons in 1961. The landings statistics for 1962 are not yet complete, but there is every indication that the total will not be as high as for 1960 and 1961. Examination of the statistics by gears indicate that the increases in 1959 and 1960 can be attributed to an increase in the trawl landings from the northern part of the Subarea (Division 3K) where the total cod landings in 1957, 1958, 1959, 1960 and 1961 were 15, 40, 83, 118

TABLE 3. SUBAREA 3: COD LANDINGS BY COUNTRIES AND DIVISIONS (THOUSANDS OF METRIC TONS) FOR 1958-61. (1962 FIGURES ARE PROVISIONAL.)

		CANADA		FRANCE		DEN.	GER-	ICE-				POR-					NON-	
DIV.	PERIOD	M	NFLD.	M	ST.P.	F	MANY	LAND	ITALY	NORWAY	POLAND	TUGAL	SPAIN	USSR	UK	USA	MEMBERS	TOTAL
3K-L	1955/58	6	141	30	-	-	-	+	-	+	-	42	12	1	+	-	-	232
	1959	2	144	32	-	-	1	2	-	+	-	49	33	9	1	-	-	273
	1960	5	144	31	+	-	2	1	+	-	-	38	26	27	6	-	+	280
	1961	2	104	32	1	-	3	+	-	+	1	45	39	13	3	-	-	237
	1962	3	117	( )	+		( )	+	-	( )	2	35	( )	14	( )	-	( )	
3N	1955/58	-	-	+	-	-	-	-	-	-	-	+	+	6	-	-	+	6
	1959	-	-	-	-	-	-	-	-	-	-	-	1	7	-	-	+	7
	1960	-	-	-	-	-	+	+	-	-	-	+	1	12	-	-	-	12
	1961	-	-	3	-	-	1	-	-	-	+	2	1	12	1	-	-	20
	1962	-	+		-			-	-		1	2		11		-		
3N-O	1955-58	4	9	4	-	-	+	-	-	-	-	19	47	-	+	-	+	77
	1959	2	2	+	-	-	-	-	-	-	-	18	40	+	1	+	-	63
	1960	1	2	+	+	-	-	-	+	-	-	14	34	24	1	-		78
	1961	2	3	+	1	-	+	-	-	-	-	9	33	29	1	+	-	72
	1962	1	2		+			-	-		+	4		8		+		
3P	1955/58	5	30	10	4	-	+	-	-	-	-	6	9	-	1	-	-	65
	1959	5	40	7	-	-	-	-	-	-	-	7	8	-	1	+	-	71
	1960	5	47	6	4	-	-	-	-	+	-	4	19	-	2	-	-	87
	1961	4	40	20	4	-	-	-	-	-	-	15	37	-	3	-	-	123
	1962	1	39		2			-	-		-	8		+		-		
3NK	1955/58	-	-	+	1	2	+	-	-	6	-	-	-	-	+	-	-	9
	1959	-	-	-	1	6	-	-	-	4	-	-	-	-				13
	1960	-	-	-	-	10	-	-	-	5	+	-	-	-	-	-	+	14
	1961	-	-	-	-	6	-	-	-	3	-	-	-	-	-	-	-	8
	1962	-	-		-			-	+		-	-	-	-		-		
TOTAL	1955/58	17	174	45	5	2	+	+	+	6	-	67	68	7	2	-	+	390
	1959	9	187	39	5	8	1	2	+	4	-	74	81	15	3	+	+	425
	1960	11	194	37	4	10	2	1	+	5	+	56	79	63	9	-	1	471
	1961	8	148	55	6	6	4	+	-	3	1	71	104	48	8	+	-	461
	1962	5	158		3			+	+		2	49		33		+	-	

and 92 thousand tons respectively. In 1961 there was a considerable decrease in the landings from 3K-L, but the total of 460 thousand tons was maintained by 50% increase in cod landings from 3P from a 1955-61 level of 70-80 thousand tons to 123 thousand tons, attributed to increased trawler activity. There has been no significant change in cod landings for 3N-O, but in 3M the total has increased from 7 thousand tons in 1959 to 20 thousand in 1961, largely due to increased USSR trawler activity.

The landings per unit effort for 1959 and 1960 are not very different from 1955 to 1957 but show considerable improvement over 1958, in which year a marked decrease in the landing per unit effort for nearly all the codfishing fleets was attributed largely to unusual hydrographic conditions. Because of the recent tendency for the fleets to shift the cod fishery from 3L northward into 3K, where the cod are of smaller average size, there has been a slight decrease (about 3 cm) in the mean size of cod in the trawl landings. This is, however, not great enough to warrant any change in our previous assessments for the 3K-L divisions. An interesting development in these divisions since 1958 has been a seasonal shift in the fishery from summer and autumn concentrations to winter and spring. This had the effect of maintaining the annual landing per unit effort at about the same level as previously. Actually this parameter has decreased gradually since 1957 in the summer and autumn fishery. In view of these developments it is believed that a reassessment for these northern cod stocks of the subarea may be necessary in the near future, at which time the effort changes may have resulted in an altered size composition of the stocks.

Haddock

As pointed out in the published Assessment Report, haddock landings from Subarea 3 steadily declined from 1955 to 1959. However in 1960, USSR trawlers for the first time exploited the summer and autumn concentrations of haddock in Division 3N. Their landings of cod and haddock were not separated in the 1960 statistics, but USSR scientists estimate that about 60% of the 3N-O cod and haddock landings consisted of haddock. The effort on haddock in 1960 was concentrated largely in 3N. On this basis, USSR trawlers took about 36 thousand tons in 1960. In 1961 they landed 40 thousand tons shared equally between Divisions 3N and 3O. The total landings of haddock in 1960 and 1961 were therefore 66 and 77 thousand tons respectively, up from 28 thousand tons in 1959. Although the 1962 statistics are not yet complete, USSR landings amounted to less than 2 thousand tons and this is evidence that the total landings may not even be half those of 1960 and 1961 (Table 4). In the view of Soviet scientists, a decrease in haddock catches in 1962 compared with 1960-61 may be attributable to unfavourable hydrological conditions in 1962; in the spring and summer seasons the off-bottom temperature in the south-western and south-eastern parts of the Grand Bank was below average and concentrations of haddock were not commercially dense. The Soviet trawlers did not conduct a haddock fishery there in spring and summer of 1962 (1963 Document No. 54). In any case, however, Canadian data (1963 Document No.13) show that year-classes since those of 1955 and 1956 have been very weak resulting in little recruitment of young fish to the fishable stock.

The previous assessments for haddock were based on combined length-composition data for the year 1955 to 1958, a period during which the very abundant 1949

TABLE 4. SUBAREA 3: HADDOCK LANDINGS BY DIVISION AND COUNTRIES FOR 1959 TO 1961 AND THE ANNUAL AVERAGE FOR 1955-58 (THOUSANDS OF METRIC TONS).

		CANADA		FRANCE					
DIVISION	PERIOD	M	NFLD.	ST. P.	ITALY	SPAIN	USSR	UK	TOTAL
3N-O	1955/58	5	15	-	-	28	-	+	48
	1959	6	15	-	-	8	-	+	28
	1960	4	13	3	-	6	(36)	+	66
	1961	8	22	4	-	3	(40)	+	77
	1962	7	21	2	-		(2)		
3P	1955/58	6	11	-	-	5	-	+	24
	1959	1	1	-	-	1	-	+	3
	1960	1	1	+	-	2	-	+	4
	1961	+	1	+	-	2	-	+	3
	1962	+	+	+	-		-		
3NK	1955/58	-	-	3	-	-	-	-	3
	1959	-	-	4	-	-	-	-	4
	1960	-	-	-	-	-	-	-	-
	1961	-	-	-	-	-	-	+	-
	1962	-	-	-	+		-		
	1955/58	11	26	3	-	33	-	1	75
	1959	7	10	4	-	9	-	+	35
TOTAL	1960	5	14	3	-	8	(36)	+	66
	1961	8	22	5	-	4	(40)	+	80
	1962	7	21	2	+		(2)		

NOTES:

A) LANDINGS FOR 3N-O INCLUDE SMALL QUANTITIES LANDED FROM DIVISIONS 3K AND 3L.

B) LANDINGS ARE CONSIDERED TO BE ENTIRELY BY TRAWLERS, THOSE BY OTHER GEARS BEING NEGLIGIBLE.

year-class was represented successively at 6, 7, 8 and 9 years of age. Prior to this period research vessel data and sampling of Canadian landings indicate that this same year-class made important contributions to the catch as 5- and 4-year olds, although at these ages there were large quantities discarded so that they did not contribute importantly to the landings of those earlier years. Since 1959 this year-class has become negligible, and a high proportion of the 1960, 1961 and 1962 catches consisted of fish belonging to an abundant 1955 year-class, with some contribution by a less abundant 1956 year-class. With this variation in the year-class strength, there are great changes in the size-distribution of fish in the catches (as distinct from landings) from year to year. This makes it difficult to arrive at an average size-composition which may be fairly representative of the size-composition of the yield of a single year-class throughout its life history in the fishery. Thus, while assessments given in the published Assessment Report seem appropriate for recent conditions and no revision has been attempted so far, compilations of new data and reviews of older records are being made in an attempt to detect effects on our assessment of such periods of entry of strong year-classes into the fishery.

Redfish

Recent landings of redfish in Subarea 3 are shown by divisions and countries in Table 5. Increased exploitation of the stocks in Division 3K and L by USSR and Iceland continued with increased landings to a maximum of 168 thousand tons in 1959. Landings in 1960 dropped sharply to 58 thousand tons and in 1961 to 38 thousand tons. From data so far available for 1962 (USSR landings at 8 thousand tons), the 3K-L redfish landings may not be more than half of the 1961 level. In Division 3M the redfish landings, almost entirely by USSR trawlers, remained at just over 50 thousand tons in 1958 and 1959, but in 1960 and 1961 they declined to 8 thousand and 15 thousand tons respectively. When

TABLE 5. SUBAREA 3: REDFISH LANDINGS (THOUSANDS OF METRIC TONS)

DIVISION	PERIOD	CANADA M.	CANADA NFLD.	FRANCE ST. P.	GERMANY	ICELAND	POLAND	USSR	UK	USA	NON-MEMBERS	TOTAL
3K-L	1958	+	+	-	-	44	-	42	-	-	-	86
	1959	+	+	-	9	59	-	99	+	+	1	168
	1960	+	1	+	5	7	-	42	1	-	3	58
	1961	+	1	+	8	4	2	24	+	-	-	38
	1962	+	+	+	( )	2	3	8	( )	+	( )	
3M	1958	-	+	-	-	-	-	54	-	+	1	55
	1959	-	-	-	-	-	-	52	-	-	+	52
	1960	-	-	-	+	+	-	8	-	-	-	8
	1961	-	-	-	1	+	+	14	+	-	-	16
	1962	-	+	-	( )	-	+	6	( )	-	( )	
3N-O	1958	1	3	-	+	-	-	-	-	10	-	14
	1959	1	2	+	-	-	-	1	+	15	-	20
	1960	+	1	+	-	-	-	7	+	13	-	22
	1961	1	2	1	+	-	-	6	+	16	-	26
	1962	1	6	+	( )	-	+	7	(-)	11	( )	
3P	1958	+	3	1	+	-	-	-	-	+	-	4
	1959	+	3	1	-	-	-	+	-	1	-	4
	1960	2	5	+	-	-	-	-	-	3	-	9
	1961	1	8	+	-	-	-	-	-	+	-	10
	1962	1	9	+	( )	-	-	-	( )	3	( )	
TOTAL	1958	1	7	1	+	44	-	96	-	10	1	159
	1959	1	5	1	9	59	-	152	+	17	1	246
	1960	2	6	+	5	7	-	57	1	15	4	99
	1961	2	10	1	9	5	2	44	+	17	-	90
	1962	2	15	1	( )	2	4	21	( )	14	( )	

complete statistics for 1962 are available the total landings of redfish may not likely be more than about 10 thousand tons. No very significant changes have occurred in 3N-O and 3P over this short period. As a result of the great decrease in availability of redfish in 3K-L and 3M, the total redfish landings from the subarea decreased from nearly 250 thousand tons in 1959 to only 99 thousand tons in 1960 and 90 thousand tons in 1961. Incomplete statistics indicate a further decline in 1962 to probably 70 thousand tons or less. These changes were associated with diversions of effort from redfish fishing to fishing for other species and in other areas.

The length-composition data now available for 1959, 1960 and 1961 from all divisions are not appreciably different from those of 1958, on which the previous estimates of immediate effects are based. Consequently, no reassessment has been warranted, (see Section III A and D of this report), with the exception that, following a request from the Commission in 1961, assessments for redfish of 3N-O by 1/4-inch intervals between mesh sizes of 3 and 4 inches are given in Section III B.

D. Subarea 4.

Cod

TABLE 6. SUBAREA 4: COD LANDINGS (THOUSANDS OF METRIC TONS)

		1957/8	1959	1960	1961
4X	CANADA (M)	12	13	13	13
	USA	1	1	+	+
	TOTAL	13	14	13	13
4T AND 4V (SPRING)	SPRING FISHERY	25	44	46	40
	SUMMER FISHERY	62	56	37	43
	TOTAL	87	100	83	83
4W AND 4V (EXCEPT SPRING)	TOTAL	32	35	47	52

Division 4X There have been no significant changes in this fishery.

Division 4T and 4V (Spring)

Landings by the line fishery (mostly Canadian) have continued to decrease, but the totals have been sustained by increased otter-trawl landings, especially in the spring fishery by the European large otter-trawl fleet.

The effects of the great increase in total effort which took place during the mid 1950's are increasingly evident in this stock. Research-vessel surveys carried out in northern 4T during summer months indicate a high mortality rate and rapid drop in the numbers of large fish. This is reflected in a marked decrease in average lengths of fish caught by Canadian fishermen during their summer fishery in the area and a decrease in their landings per unit effort.

These effects of fishing are not evident in the European spring catches from the stock when it is present in southern 4T and 4Vn. This contrast is an expression of a difference in the character of the fishing effort and fish distribution at different seasons.

In view of the recent effort changes in 4T-4V area, it was anticipated that the age- and size-composition derived from commercial samples represented a "transitional" condition in which large fish were over-represented compared with the expected long-term condition. This is confirmed in 1959 to 1962 data for the summer fishery, although again the effect is less evident in the spring fishery. On this account, it is too early to offer new mesh assessments. If, however, the trend towards fewer large fish in the catch should continue, it is likely that revised assessment calculations will show that our first estimates of long-term benefits of increased mesh were too high.

Division 4V (except spring) and 4W

Total landings have increased regularly since 1958 partly because of increased European (mainly Spanish pair trawl) fishing and partly because of increased landings by inshore Canadian lines. The latter appear, however, to fish on an almost completely separate inshore cod stock. Offshore Canadian line fishing, which formed a decreasingly important share of the Canadian catch up to 1958, stopped after 1959.

Relative abundance of the offshore stocks as measured by Canadian medium otter-trawl landings per unit effort declined sharply in 1959 and 1960. This may, however, be an exaggerated index of the real abundance change as it is based on catches of vessels which in the two years appear to have concentrated more on haddock fishing than in the earlier years.

Haddock

TABLE 7. SUBAREA 4: HADDOCK LANDINGS (THOUSANDS OF METRIC TONS)

		1957/58	1959	1960	1961	1962
4X	CANADA	9	9		9	12
	USA	10	7		9	6
	TOTAL	19	16		18	18
4V-W	TOTAL	26	33	27	27	(21)

Division 4X

Total landings have remained at the same level in recent years, but in 1962 the US landings dropped while those of Canada increased. Of the total landings in 1961 and 1962, otter trawls have accounted for nearly 90% and line trawls and hand lines the remaining 10%.

We have been able, during the year, to obtain a better estimate of Z than that given in the Assessment Report. The new estimate of 0.7 is rather higher than the original value of 0.45. The original assessments were made for a rather large range of F,

however, and should still include an assessment applicable to the fishery in spite of the revised estimate of total mortality.

Division 4V-W No significant changes have occurred.

Redfish

TABLE 8. SUBAREA 4 (DIVISIONS 4V-W-X): REDFISH LANDINGS (THOUSANDS OF METRIC TONS)

1960	37
1961	32
1962	37

Only minor changes in landings, effort and abundance have been noted for this fishery.

E. Subarea 5.

TABLE 9. SUBAREA 5: LANDINGS (THOUSANDS OF METRIC TONS)

SPECIES	1956-58*	1959-60*	1961	1962
COD	13	15	18	24
HADDOCK	52	43	52	59
REDFISH	20	13	14	14
SILVER HAKE	48	64	43	86
YELLOWTAIL	10	13	17	26

* AVERAGES

Nearly all of the landings are accounted for by otter trawlers of the US, Canada and USSR. Until 1962, the US fleet landed nearly all groundfish. During 1961, USSR commenced fishing for sea herring on Georges Bank, landing 67 thousand tons with a by-catch of groundfish of approximately one thousand tons. The USSR fleet shifted more of its effort to groundfish in 1962, however, and was responsible for nearly all of the increase in landings noted in Table 9, except for that of yellowtail flounder.

Cod

The increase in cod landings is due in part to the recruitment of a larger than average year-class in 1960 and 1961.

Haddock

The abundance of haddock on Georges Bank, which accounts for about 75% of the landings, has shown a small increase in 1961 and 1962 because of the moderately strong year-classes of 1958 and 1959, which are now fully recruited. Subsequent year-classes appear somewhat weaker, and may lead to a lower abundance next year.

A new estimate of Z of 0.7 is somewhat higher than that (0.6) listed in the published Assessment Report but is still within the range of E given in Table 8C of that Report.

Yellowtail Flounder

This species continues to show a high level of abundance caused by recruitment of the strong 1958 and 1959 year-classes. Effort has increased somewhat in 1961 and 1962. In spite of the fishermen's continued use of a 4 1/2 or 5.0 inch mesh net (synthetic) the high abundance of smaller sized fish has caused some discarding.

Redfish

There have been no notable changes in the redfish fishery of Subarea 5.

Silver Hake

The two-fold increase in landings from 1961 to 1962 is the most notable change in the Subarea 5 fishery. The apparent abundance, as measured by the landings per unit effort of US vessels has dropped only slightly in 1962. However, if the increased effort is continued, it might affect the fishery significantly, and this will require further study in the coming year (see also Section III A).

Effects of Increases in Fishing Effort on Cod and Haddock Landings

The statistics, since 1917, of estimated annual landings, days fished and landings per days fished have been examined to determine, empirically, the effects of increasing fishing effort on the stocks of cod and haddock.

The observed trends indicated that during the last decade the landings of cod have, on the average, decreased with increased total fishing effort. It is uncertain to what extent this may be a result of selective fishing for the more common and commercially-desirable haddock species and avoidance of cod, or to what part is played in the relationship by effects of general hydrographic conditions on cod abundance. In the absence of such effects the observed relationship would indicate that with present mesh size, present fishing effort is higher than that which would give maximum yield and that further increases in effort should, in the long term, result in an even smaller total cod landing.

For haddock, Fig. 11b of the US Research Report (1963 Doc. No.12) suggests the present levels of effort appear to provide landing near the maximum; further increases in effort would not, in the long run, increase these landings, and could cause them to decrease.

III. Remarks on Earlier Assessments

A. Methods and Interpretations

In reviewing our earlier assessments in the light of data available since 1958, the methods used have been the same as those employed in the published Assessment Report. In general, therefore, the same considerations apply in interpreting the results.

Difficulties encountered by the Assessment Group in its attempt to measure the effect of changing effort levels on the mortality rates have been highlighted in the introduction of this report and in the study proposals. In addition the following points warrant emphasis:

1) Mesh regulations are intended to alter the size-compositions of catches. In some cases, however, the data supplied were for landings, and no information on discards was available. Where the data on catches is poor the assessments are correspondingly weak.

2) All estimates of yield are in terms of yields per recruit. Actual catches will in addition be affected by changes in availability or year-class strength.

3) The size-composition data used as a base-line in assessments have generally been an average for two or three recent years, thereby reducing the influence of year-to-year fluctuations in abundance and availability on our results. The applicability of the assessments depends on whether the average size compositions used are stable and are not subsequently changed by the changes in the fishery.

While to some extent all our assessments are affected by these considerations, the importance of one or more of the above points is most obvious in the case of redfish fisheries of northern sub-area and to a lesser extent in the case of the haddock of Subarea 3 and the silver hake of Subarea 5. Despite uncertainties involved, the group has included new or revised assessment tables for fisheries of present special Commission interest.

B. New Assessment Tables

TABLE 10. MESH ASSESSMENTS FOR 3N-O REDFISH BY ONE-QUARTER INCH INTERVALS OF MESH CHANGE FROM 3¼ TO 4, AND HALF-INCH INTERVALS TO 6 INCHES AS REQUESTED BY THE COMMISSION (SEE ANN. PROC. VOL. II, ITEM 15 C, 1961).

MESH SIZE CHANGE (INCHES) FROM 3" TO	GEAR - COUNTRY	% CHANGE IN 1958 LANDINGS IMMEDIATE	BREAK-EVEN VALUE OF E AT LEAST
3 1/4	TRAWL-CANADA	- 3	0.6
3 1/2	(28%)	- 9	
3 3/4	USA (72%)	-18	
4		-31	0.7
4 1/2		-56	
5		-76	
5 1/2		-89	
6		-95	

TABLE 11. MESH ASSESSMENT FOR SILVER HAKE FOR SUBAREA 5 BASED ON US DATA (SEE NOTE). SEE, HOWEVER, SECTIONS IIE AND IIIA FOR FURTHER COMMENT ON THIS FISHERY.

MESH SIZE CHANGE (INCHES)	% CHANGE IN 1957-59 LANDINGS IMMEDIATE	LONG-TERM FOR	
		0.4 0.6	E
		0.2 0.3	F
		0.3 0.2	M
2 3/4 TO 3	- 4	+3	+ 7
3 1/2	-22	+6	+21
4	-47	+4	+38

NOTE TO TABLE 11 (SEE PAGE 38)

NOTE TO TABLE 11: PREVIOUS ASSESSMENTS WERE BASED ON LENGTH- AND AGE-COMPOSITION OF LANDINGS FOR HUMAN FOOD ONLY, AND REPRESENT ONLY THE LARGER FISH SUITABLE FOR USE AS FOOD IN THE US MARKETS. HOWEVER, A CONSIDERABLE AMOUNT OF DISCARDING OF SMALL FISH DOES OCCUR. IN OUR REVISION, ESTIMATES OF THE AMOUNT AND LENGTH-COMPOSITION OF THE CATCH HAVE BEEN MADE, USING AS A BASIS SAMPLES OF THE INDUSTRIAL LANDINGS FROM WHICH SMALL FISH ARE NOT DISCARDED.

ASSESSMENTS BASED ON THE LENGTH-COMPOSITION OF CATCH OBTAINED IN THIS MANNER ARE PRESENTED IN THE TABLE. TOTAL MORTALITY WAS ESTIMATED BY CONVERTING THE LENGTH-FREQUENCY TO AN APPROXIMATELY EQUIVALENT AGE-FREQUENCY, USING INFORMATION ON MEAN SIZE AT AGE. AN ESTIMATE OF $Z = 0.5$ WAS OBTAINED. ALTHOUGH ASSESSMENT CALCULATIONS ARE PRESENTED USING A VALUE OF E OF 0.4 AND 0.6, THE LATTER IS CONSIDERED THE MORE PROBABLE BECAUSE FISHING INTENSITY IS RATHER HIGH. HOWEVER, NO DIRECT ESTIMATE OF F OR M IS AVAILABLE.

THE GAINS MAY BE OVERESTIMATED BECAUSE (1) THE METHOD OF ESTIMATING SIZE-COMPOSITION OF CATCH MAY HAVE OVERESTIMATED THE CATCH OF SMALLER FISH BY THE FOOD-FISHERY WHICH APPEARS TO CONCENTRATE ON CATCHING LARGER FISH THAN THE INDUSTRIAL FISHERY, AND (2) SILVER HAKE MAY SUFFER SIGNIFICANT MORTALITY IN THE PROCESS OF ESCAPING THROUGH THE LARGER MESH. THE TABLE INDICATES THAT THE VALUE OF E MUST BE BETTER ESTABLISHED BEFORE ASSESSMENTS CAN BE MADE WITH CERTAINTY. FROM OUR PRESENT KNOWLEDGE IT APPEARS THAT INCREASES IN MESH SIZE WOULD LIKELY LEAD TO LONG-TERM GAINS. (FOR FURTHER DISCUSSION SEE SECTIONS IIE AND IIIA OF THIS REPORT.)

C. Transitional Effects of Mesh Changes

Immediately after an increase in mesh size the catch will drop; this change is expressed by the index "immediate loss" in the published Assessment Report. Thereafter the catch begins to increase and approach the long term level. Calculation of a curve, relating rate of catch to time elapsed since a mesh change, permits prediction of the catch which would be taken in the first year and in each subsequent year. (A description of the method is given in Annex 2.)

Table 12 gives examples of results for cod, haddock and silver hake in particular subareas, and for particular values of E and supposed mesh change. In each case there are a certain number of years of decreasing losses (in the first of which the loss is to a greater or lesser extent smaller than the "immediate" loss), followed by a period of increasing gains. The time at which the landing attains the level it had before the mesh change is indicated by a solid horizontal line. Similarly, the time at which the losses in the initial years have been made up by subsequent gains is shown by a double line. The table also shows in each case the number of years during which losses would be expected, and the average annual loss during that period.

Although calculations have been made for few examples, some generalizations emerge at this stage. Thus, other things being equal, the bigger the immediate loss the longer it will take to reach the level of landing which pertained before the mesh change. For stocks with a fast growth rate this will occur sooner than for those with slow growth. If the long-term gain is large, the time taken to make up losses will be relatively short, and conversely for small long-term gains. In fisheries in which trawls and other gears are used, the total landings by all gears will reach its previous level, and total losses will be made up, sooner than by trawls alone; how much sooner depends mainly on the relative contribution by trawls and by other gears to the total landing.

The long-term gain will actually be attained only after a period equal to the number of age-groups of fish in the catches, but it will, in most cases, be very nearly

attained several years before this; how much earlier depends on the growth rate and the relative contribution of the oldest age-groups to the catches. A rough idea of the rate of recovery of initial losses and approach to the long-term gain is given by the following rule: after a period of years equal to the difference between the age of the youngest fish in the catch and an older age which is defined such that half the fish in the catch are this age or younger, the catch level will be about halfway between the level immediately after the mesh change and the long-term level.

TABLE 12. EXAMPLES OF EFFECTS OF MESH CHANGE ON ANNUAL LANDINGS. IN COLUMNS SHOWING CHANGE IN YEAR-BY-YEAR LANDINGS COMPARED WITH PRE-REGULATION AVERAGES, A SINGLE LINE (———) MARKS TIME AT WHICH THE OLD LEVEL IS REGAINED AND A DOUBLE LINE (═══) THE TIME AT WHICH ACCUMULATED LOSSES ARE BALANCED BY ACCUMULATED GAINS. FOR FURTHER EXPLANATIONS, SEE TEXT.

SPECIES	COD		HADDOCK		SILVER HAKE
SUBAREA AND DIVISIONS	3 N,O		4 V,W		5
REFERENCE YEARS	1955-58		1959-60		1957-59
MESH CHANGE FROM-TO- (INCHES)	4 - 5 1/2		4 1/2-5		2 3/4-3 1/2
E	0.64		0.7		0.6
F	0.45		0.5		0.3
M	0.25		0.2		0.2
REFER TO TABLE IN FIRST ASSESSMENT REPORT	6D		7F		-
PER CENT CHANGE IN LANDINGS OF:	TRAWL	HOOK AND LINE	TOTAL ALL GEARS	TRAWL	TRAWL
"IMMEDIATE" (SEE ASSESSMENT REPORT)	-14	0	-11	-16	-21
(1ST YEAR AFTER REGUL.	-11	+3	-9	-13	-19
(2ND " " "	- 7	+7	-4	- 9	-13
(3RD " " "	- 2	+13	0	- 6	- 4
(					
(4TH " " "	+ 1	+17	+4	- 5	+ 5
(5TH " " "	+ 3	+20	+6	- 3	+12
(					
*(6TH " " "	+ 5	+21	+8	- 1	+16
(					
(					
(7TH " " "	+ 5	+22	+8	+ 1	+17
(8TH " " "	+ 6	+23	+9	+ 1	+18
(					
(9TH " " "	+ 6	+23	+9	+ 2	+19
(10TH " " "	+ 7	+23	+9	+ 3	+20
LONG-TERM	+ 8	+25	+12	+4	+21
DURATION OF PERIOD OF LOSSES (YRS)	3	-	2	6	3
AVERAGE % ANNUAL LOSS DURING PERIOD OF LOSSES	7	-	6	6	12

* YEAR-BY-YEAR CHANGES COMPARED WITH PRE-REGULATION

D. Validity of Selection Factors Used in the Mesh Assessments for Cod, Haddock and Redfish

In arriving at estimates of immediate and long-term effects of changes in mesh size on the cod, haddock and redfish fisheries, the Working Group used selectivity data derived from experiments undertaken by research vessels in the Convention Area (Ann. Proc. Vol. 8). In general, the experimental catches were substantially smaller than the average of catches for the commercial fisheries on these species, particularly to the north in Subareas 1, 2 and 3.

For redfish, some data available to the Group at the time, from German experiments in Subarea 1, indicated that selection factor might vary inversely with the size of catch (1961 Doc. No. 7). It was therefore noted in the Assessment Report (Section 4C) that the selectivity values used for redfish, and hence also the estimates of immediate loss calculated from them, might be too high. This inverse relationship between selection factor and size of redfish catch was confirmed in further experiments by Germany in East Greenland waters in 1961 (1962 Doc. No. 40). These results show a reduction in selection factor from values of 2.8 - 3.0 in hauls containing only 300 - 500 fish to about 2.5 - 2.6 for hauls of 1000 - 1300 fish.

The selectivity data used in the redfish assessments correspond with the lower of these two ranges of values, but the average sizes of commercial redfish catches frequently far exceed the largest catches taken in the research vessel experiments. It is likely, therefore, that the release of redfish from the commercial catches is less than was assumed in our assessments. We therefore wish to emphasize that the immediate losses for the redfish fisheries are probably overestimated, perhaps substantially so in the northern areas where catches tend to be large, but from the present selection data confined to small experimental catches the magnitude of the error cannot be measured.

As a result of the inverse relationship found between selection factor and size of catch for redfish, member countries at the 1962 Annual Meeting were urged to examine their selectivity data for all species of groundfish from this point of view. Canadian alternate-haul experiments on haddock in Subarea 3 (1963 Doc. No.53) show that the selection factors for large catches are slightly lower than those estimated for small catches, but the lower selection factors (3.1 - 3.4) are still not essentially different from that used for the haddock assessments (i.e. 3.2). A similar slight decrease in the selection factor with increase in catch size for cod was reported from UK experiments in the Northeast Atlantic, the selection factor decreasing by about 0.1 per catch weight increase of 1 1/2 tons, for catches up to about 5 tons. This is of the same order of magnitude as was found for haddock. In contrast the changes in selection factors for cod and haddock do not indicate any serious reduction in escapement of small fish in large catches. Hence, the assessments are probably not biased to the same extent as are those for redfish.

In connection with examining the reports on selectivity the group noted that the statistical variability inherent in selection data may often be considerable and that statistical (within sample) limits of the selection factor and selection range should both

be included when selection data are reported to the Commission.

IV. Study Programs and Recommendations

A. Sampling

The ability to assess fisheries and predict their course depends critically on the adequacy of our knowledge of the sizes and ages of fish landed and of how they are related to the stocks. In this connection the subcommittee reviewed studies of Canadian sampling data (1963 Doc. 49) for Subarea 4. It noted that while Canada does have an extensive sampling program, this often falls far short of defining the compositions of various stock components. Such short-comings can in some cases be prevented only by more extensive sampling. In some others detailed and timely analyses of data may point to means for making the sampling more representative. The Subcommittee

recommends (15)

that different countries study their own sampling programs with a view to measuring the between-sample variations in the average figures submitted by countries for publication in the Sampling Yearbook, and report their results to R & S.

B. Effort Statistics

The group noted the great advances made by the Commission and its member countries in the collection of effort statistics and their publication on a routine basis. It noted, however, that there is still need for studies which will ensure the correct interpretations of these data and will lead to the evolution of a standard meaning for the effort nomenclature at least within countries. (See FAO Fishery Reports F1c/R3, Requirements and improvements of fishery statistics in the North Atlantic area. 1962). Of particular relevance here are studies of the reliability of effort statistics collected on an interview basis. It is therefore

recommended (16)

that studies on the general problem of interpretation of effort statistics along the lines of those made on Canadian data (1963 Doc. Nos. 50, 51 and 52) be undertaken by all member countries.

C. Special Studies

Evaluation of the effects of regulation on the yield of fisheries when the effort changes will require detailed data on the daily operations of vessels and their catches, not currently available to the Commission. Countries should therefore study the feasibility of obtaining this information, at least on a sample basis, and of making it available to the Commission scientists for study. The Subcommittee

recommends (17)

that a report on the detail in which effort data are now collected and of the feasibility of getting the requisite detail and reporting it to the Commission should be submitted to the Secretariat in advance of the next annual meeting and reviewed by the Research and Statistics Committee.

The basic information is of a type which can probably only be obtained satisfactorily from log-book records. The group recognized that the Commission may thus be asking countries for more detailed information about their operations than they are able to provide on a routine or current basis. It stresses, however, that for purposes of study this information does not need to be on current operations, and in certain cases at least, the countries concerned can carry out the necessary studies by themselves and report the results in general terms. The important thing is that the information be available in the countries.

V. Graphical presentation of trends in ICNAF fisheries

During its work of the past two years numbers of the Group have spent appreciable time in compiling landings and effort statistics into a form which would permit appraisal of recent trends. Realizing that development of a standard graphical presentation of pertinent data would be of general interest, the Subcommittee

recommends (18)

that the Secretariat be asked to draw up and maintain a series of such charts for use at Annual Meetings. These might well take the form of charts of total landings by species for subdivisions and for principal gears, associated with a chart giving a particular measure of catch per unit effort. Some members of the Assessment Subcommittee who are familiar with the compilations done for the Assessment Report might well be asked to advise on design.

Annex 1. Meetings and Participants

Two meetings of the Group have been held since the time of final preparation and presentation of the Assessment Report. These were in advance of the 1962 and 1963 Annual Meetings of ICNAF at Moscow and Halifax, respectively.

Attendance at the Moscow meeting:

Members	Observers
L.M.Dickie (Canada) (Convener)	L. Birkett (UK)
R.J.H.Beverton (UK)	E. Bratberg (Norway)
R.C.Hennemuth (USA)	(Mrs.)T.F.Dementyeva (USSR)
V.M.Hodder (Canada)	(Mrs.)F.P.Milshtein (USSR) (Interpreter)
S.J.Holt (FAO)	A.I.Treschev (USSR)
S.A.Horsted (Denmark)	
Ju.Ju.Marty (USSR)	
R. Monteiro (Portugal)	
J.E.Paloheimo (Canada)	
B.B.Parrish (UK)	

Attendance at the Halifax meeting:

Members	Observers
L.M.Dickie (Canada)	G. Cannone (Italy)
R.J.H.Beverton (UK)	F. Chrzan (Poland)
A.S.Bogdanov (USSR)	S.A.Studenetsky (USSR)
E.L.Cadima (Canada)	G.A.Semin (USSR) (Interpreter)
R.C.Hennemuth (USA)	
V.M.Hodder (Canada)	
S.A.Horsted (Denmark)	
R. Monteiro (Portugal)	
J.E.Paloheimo (Canada)	
B. Rasmussen (Norway)	
G.P.Zakharov (USSR)	

As in our earlier work the group has continued to receive active help from Mr.J.A. Gulland (UK) and regrets that he has been unable to attend the meetings and take part in the discussions.

Mr.S.J.Holt and Mr.B.B.Parrish who have been active contributors to the past work of the group were unable to attend the Halifax meetings. Progress in fishery assessment studies depends heavily upon the support of such scientists and it is hoped that this part of the Commission's work may benefit from their full participation in future.

The Group wishes to acknowledge the special efforts made during the year by Mr. Calvin DeBaie, ICNAF Statistician, to supply us with statistical data prior to their publication. We also are grateful to a number of scientists and technicians at Lowestoft, St. Andrews, St. John's and Woods Hole, who supplied recent sampling data and assisted in our work of compilation and calculation.

Special thanks are extended to our colleague, Dr.Ju.Ju.Marty, Vice-Director of VNIRO, and members of his staff, for the assistance and many courtesies extended to us during our Moscow meetings. They have contributed much to our enjoyment of both work and leisure time.

Annex 2. Gulland's method to calculate transitional Effects of Mesh Changes

The method involves first calculating the expected effects at certain transitional stages, defined in terms of lengths to which fish have grown, and then relating these stages to fish age, hence to actual time elapsed. To a first approximation the benefit of the mesh regulation can be imagined as progressing through the sizes of fish. Thus at any time after a mesh change, fish greater than a certain size, ℓ, have been unaffected by the change, having been fished by the old mesh since they were at the selection size. Fish less than this size have received the benefit of regulation, having been fished by the new, larger mesh when in the selection range and since. That is, if

L = immediate loss
Q = gross gain
G = long-term gain
$(1+G) = (1-L)(1+Q)$,

then all fish greater than length ℓ are as abundant as before the change and all fish less than length ℓ are $(1+Q)$ times as abundant as before the change.

If w_x = mean weight of fish of length x
W_1 = total landings before the mesh change; then landings immediately after the mesh change

$$= (1-L)W_1$$
$$= \sum_0^\infty w_x \cdot {}_xN_k$$

where ${}_xN_k$ is the number of fish of length x retained by the new mesh immediately after the change. Landings at some intermediate time later, when fish of sizes less than ℓ have received the benefit of the new mesh

$$= \sum_0^\ell w_x(1+Q)\ {}_xN_k + \sum_\ell^\infty w_x \cdot {}_xN_k$$
$$= \sum_0^\infty w_x \cdot {}_xN_k + Q\sum_0^\ell w_x \cdot {}_xN_k$$
$$= (1-L)W_1 + QP_\ell W$$

where $P_\ell = \dfrac{\sum_0^\ell w_x \cdot {}_xN_k}{W_1}$

If the mean age of fish released is t_R, and the mean age of fish of length ℓ is t_ℓ, this transitional state will occur after a time interval equal to $t_\ell - t_R$ following the mesh change. The data required for this calculation (see Table) are the same as those used to obtain estimates of immediate and long-term effects, except that, in addition, values of mean age at each length are needed to obtain the final time scale. These were calculated from growth curves of mean length at each age. These give reasonable results for the first few years after the mesh changes, but have the effect of lengthening somewhat the calculated delay before the long-term effect is attained and this should be borne in mind when examining the table of Section IIIC.

TABLE 1. EXAMPLE OF CALCULATION OF INTERMEDIATE EFFECTS OF A MESH CHANGE

COD 3 N, 0
MESH CHANGE 4" - 5 1/2"
DISCARDING AT AROUND 40 CM AND BELOW
CATCHES IN WEIGHT:
(TRAWLS) 63356
(OTHER GEARS) 16099
(TOTALS) 79455

LANDING (TRAWLS) = W_1 = 61260

1-L=.8645
E = .64

Q = .2526
Q/W_1 = 4.1232×10^{-6}

LENGTH CLASS (CM)	WEIGHT AT LENGTH (KG) W_x	TRAWL CATCH (NUMBERS)	x^{N_K}	COL.(A) $\sum_{x}^{\ell} \omega_x \cdot {}_x N_K$	COL.(B)= $\frac{Q}{W}$ .COL.(A) $P_\ell Q$	1-L+COL.(B) CHANGE IN TRAWL LANDINGS $1-G_\ell$	AGE (YRS) (FROM GROWTH CURVE)	NO. RELEASED N_R	DELAY (YRS)
25	.13	17	0					17	
28	.18	149	0					149	
31	.25	189	7					180	
34	.33	412	21					391	
37	.43	1243	117					1126	
40	.54	2252	354				3.3	1898	
43	.68	2817	713	484	.0020	.8665	3.6	2104	0
46	.84	3231	1207	1499	.0062	.8707	4.0	2024	0.3
49	1.02	3561	1855	3391	.0140	.8785	4.3	1706	0.7
52	1.23	3670	2472	6431	.0265	.8910	4.7	1198	1.1
55	1.46	3523	2783	10494	.0433	.9078	5.1	740	1.5
58	1.72	3042	2707	15151	.0625	.9270	5.5	335	1.9
61	2.01	2743	2606	20389	.0841	.9486	5.9	137	2.4
64	2.32	2413	2365	25875	.1067	.9712	6.4	48	2.8
67	2.68	1732	1715	30472	.1256	.9901	6.8	17	3.3
70	3.07	1270	1270	34371	.1417	1.0062	7.3	0	3.8
73	3.49	970	970	37756	.1557	1.0202	7.8		4.3
76	3.95	714	714	40576	.1673	1.0318	8.3		5.0
79	4.45	462	462	42632	.1758	1.0403	9.0		5.5
82	4.99	347	347	44363	.1829	1.0465	9.5		6.2
85	5.58	224	224	45614	.1881	1.0526	10.2		6.8
88	6.22	146	146	46522	.1918	1.0563	10.8		7.7
91	6.89	110	110	47280	.1949	1.0585	11.7		8.5
94	7.62	86	86	47935	.1976	1.0621	12.5		9.4
97	8.40	71	71	48531	.2001	1.0646	13.4		10.3
100	9.22	56	56	49048	.2023	1.0668	14.3		
103	10.11	58	58	49634	.2046	1.0691			
106	11.05	67	67	50374	.2077	1.0722			
109	12.04	55	55	51037	.2104	1.0749			
112	13.09	54	54	51743	.2133	1.0778			
115	14.21	32	32	52198	.2152	1.0797			
118	15.39	27	27	52614	.2169	1.0814			
121	16.63	16	16	52880	.2180	1.0825			
124	17.93	1	1	52898	.2181	1.0826			
127	19.31	1	1	52917	.2182	1.0827			
130	20.75	1	1	52938	.2183	1.0828			
Σ		35761	23691						

MEAN LENGTH OF RELEASED FISH = 46 CM

APPENDIX II - WORKING GROUP ON AGEING TECHNIQUES

Chairman, Dr. B. Rasmussen; Rapporteur, Dr.A.C.Kohler

1. Dr. Rasmussen reviewed the work of the Workshop on Ageing Techniques (1963 Doc. No.3) held in Bergen in November 1962. The Chairman of the Committee on Research and Statistics thanked Norway and Dr. Rasmussen for the hospitality extended to the Workshop.

2. The group held a short discussion of Mr. Jensen's paper "A Standard Terminology and Notation for Age Readers" (Appendix A to 1963 Doc. No.3). The paper was approved except for the rather general title. It is

recommended (19)

that the standard terminology be referred to redfish experts to see if the terminology would be suitable for redfish otoliths as well as for gadoids.

3. Detailed notes on sampling procedures by member countries requested in 1963 Doc. No.3 were referred to the Sampling Subcommittee.

4. Reference was made to the statement in the Report of the Ageing Workshop regarding the preliminary reading of selected difficult otoliths (1963 Doc. No.3, page 4). Reference to 1963 Doc. No.69 which gives a summary of complete readings of these samples showed that serious disagreements and bias were still evident in certain cases.

5. Dr. Messtorff reported on his method of preparing transparencies of fish otoliths (1963 Doc. No.46). Mr. Beverton then reported on electronic flash photography of otoliths in colour (1963 Doc. No.33) and on mechanical aids to otolith reading (1963 Doc. No.32).

6. It was agreed at both the Workshop in Bergen and in this Workshop Group that there was little value in continuing the cod otolith exchange in its present form. It is

recommended (20)

that future co-ordination of age-reading techniques take the form of exchange of sets of photographs (transparencies and prints) marked by each country in the way that they would read them. The photos should be accompanied by corresponding otoliths. Dr. Messtorff and Dr. Kohler were asked to prepare a set of Subarea 4 cod otoliths, which exemplified the difficulties of age reading in this Subarea. These will be sent to the Lowestoft laboratory for photographing and distribution.

7. All countries represented at meeting agreed to participate in this program. A list of persons to be contacted in the various countries is appended (Annex 1). The long-term hope is that an otolith reading manual might be put together from the marked photographs.

8. In addition it is

recommended (21)

that studies of validation of cod otolith age reading methods be vigorously pursued by member countries. This could take the form of examination of Petersen length frequencies and otoliths of young fish, following the dominant year-classes from year to year, etc.

9. The reliability of age data submitted to the Sampling Yearbook was discussed and the problem was referred to the Sampling Subcommittee.

Annex 1. List of members to contact in otolith photograph exchange:

CANADA	Kohler, Biological Station, St.Andrews, N.B. Fleming, Biological Station, St.John's, Newfoundland.
DENMARK	Horsted, Greenland Fisheries Investigation, Charlottenlund, Denmark
FRANCE	Nedelec, Lab. Boulogne sur Mer, P. de C., France.
GERMANY	Messtorff, Institut fur Seefischerei, Hamburg.
ICELAND	Jonsson, University Research Institute, Reykjavik.
ITALY	Cannone, Direzione Generale della Pesca, Rome.
NORWAY	Bratberg, Institute of Marine Research,Bergen.
POLAND	E. Stanek, Sea Fisheries Institute, Gdynia.
PORTUGAL	Monteiro, Instituto de Biologia Maritima, Lisbon.
SPAIN	Figueras, Laboratorio de Vigo.
UK	Blacker, (Co-ordinator), Fisheries Laboratory, Lowestoft.
USA	Jensen, U.S. Bureau of Commercial Fisheries, Woods Hole.
USSR	Bogdanov, Central Research Institute of Marine Fisheries and Oceanography, Moscow, VNIRO.

APPENDIX III - REPORT OF GEAR AND SELECTIVITY SUBCOMMITTEE

The Subcommittee met on Monday, 27th May and Wednesday, 29th May, and Wednesday, 29th May, under the Chairmanship of Dr. W. Templeman. Rapporteur, Mr. B. Parrish.

1. From experiments conducted in the ICNAF area an analysis has been made of the differences between the selectivity of natural and synthetic twines (1963 Doc. No.35). Selection factors for the main types of double-braided polyamide (nylon etc.) and polyester (terylene) fibres were found to be some 12-20% higher than double manila fibres of the same mesh size; in this respect the findings are broadly comparable to those obtained in the Northeast Atlantic.

2. The Subcommittee noted that, with the general increase in the use of synthetics in the trawl fisheries in the ICNAF area, the manila standard in the ICNAF mesh assessments is now outdated. It accordingly

recommends (22)

that countries compare the selectivities of synthetic codend materials and the twine sizes used in their fisheries in the ICNAF area, with the selectivity of manila mesh sizes defined in the appropriate mesh regulations.

The reported results will provide the Commission if they so wish with the basis for defining equivalent mesh sizes in ICNAF mesh regulations.

3. The Subcommittee noted that the tabular summary of mesh selection data prepared by the Secretariat (1962 Meeting Document No.6) has already been of value in enabling the analysis of the selectivity differences between materials to be made. It therefore

recommends (23)

that in accordance with the recommendation passed at the 1962 Annual Meeting:-

(a) The results of all future selectivity experiments in the ICNAF area should, after first being presented as Meeting Documents by authors, be incorporated each year in a tabular summary, compiled by the Secretariat. Member countries are requested to send to the Secretariat any selection data not yet included in the existing summary.

(b) Composite summaries of all selectivity data of past years should be compiled by the Secretariat and issued at Annual Meetings at 5-yearly intervals.

(c) In presenting the results of their selectivity experiments in Meeting Documents, workers should include all items of data required for the completion of the tabular summary.

4. The items of information to be included in the tabular summaries of selectivity data were considered. It was agreed that the items which should be included in all presentations of selectivity data in meeting documents and in submissions to the Secretariat are as specified in the attached proposed layout of the tabular summary.

Experience in the Use of the new ICES Mesh Gauge (Agenda item 4b)

5. Reports on experiences in the use of the new ICES gauge were presented by Canada, the USA and the representatives of a number of European countries. These reports confirmed its satisfactory performance under field conditions and clearly demonstrated its effectiveness in reducing operator bias. It was agreed, however, that the gauge, as now constructed, was not suitable for measuring meshes above 120 mm (4 3/4"). Mr. Beverton agreed to take up this matter with the manufacturers.

6. The Subcommittee noted the results of Canadian experiments (1963 Doc. No.73) comparing the measurements made with an earlier version of the ICES (Westhoff) gauge and the standard ICNAF gauge and showing larger average mesh sizes with the ICNAF than with the ICES gauge. The effects of this on the estimated selection factors used in assessments and on the dry mesh size required to give the prescribed mesh size when wet and in use were also noted. However, the United States reported verbally that in recent comparisons of the ICES and ICNAF gauges, set out in a document not yet available to the Subcommittee, the two gauges gave essentially the same mesh sizes.

Compilation of Weight, Length and Girth Data (Agenda item 4c)

7. As at the 1962 Annual Meeting, the importance of these data in supplementing the results of selectivity experiments was noted (1963 Doc. No. 10). The Subcommittee accordingly again

recommends (24)

that countries take these measurements during the course of their investigations of cod, haddock, redfish and other species in the ICNAF area, and either present them in Meeting Documents or submit them to the Secretariat. The following measurements should be made on recently caught fish

(a) Head girth (to nearest mm) - measured with the forward edge of the tape placed at the posterior margin of the operculum.
(b) Maximum girth (to nearest mm) - with air bladder punctured.
(c) Weight of whole, ungutted fish.
(d) Length; both fork length and the length dimension which the country normally uses should be measured.

Scientists of member countries should also pay attention to the best way of presenting the results of analyses of the relationships between these variables.

Meshing of Redfish (Agenda item 4e)

8. Although no documents dealing with the redfish meshing problem in the ICNAF area were presented at the meeting, the Subcommittee noted the observations on meshing obtained during the international selectivity experiment in the Iceland area in 1962 (1963 Doc. No.34). The USSR representative also referred to observations made on a Russian vessel in Subarea 3 in January-March 1963.

9. In view of continued importance of this problem to the Commission, the Subcommittee

recommends (c) (25)

that further experimental work on redfish meshing should be carried out in the ICNAF area, and the results be presented to the next Annual Meeting of the Research and Statistics Committee. Special attention should be paid to the variations in meshing with catch size.

10. Dr. Templeman undertook to work up during the coming year his laboratory's data on redfish meshing and present the results to the next Annual Meeting.

Report on the International Selectivity Experiment at Iceland (Agenda item 4.f)

11. Dr. Jonsson outlined briefly the results obtained during the ICES international selectivity experiment conducted in the Iceland area in 1962, as contained in the provisional report (1963 Doc. 34). He noted with pleasure that the Canadian research vessel A.T.Cameron had participated in the experiment, thereby providing the first opportunity for a research vessel from a North American country to collaborate closely with European research vessels in selectivity work. Results in the report on the following items of special interest to ICNAF were noted:

(a) Effects of chafing gear on selectivity:
(b) Differences in selectivity between codends of different materials.
(c) The relation between girth measurements and selectivity.

12. The value of the large number of replicate hauls taken in this and similar experiments to investigations of the variability of trawl sampling data both within and between ships was stressed. In view of the importance of such information in fishery assessment work and in the compilation of sampling data, it was agreed that this report should be brought to the notice of the Assessments Subcommittee and the Sampling Working Group.

13. The Chairman expressed ICNAF's thanks to ICES for making the provisional report available for the Commission meeting.

New Developments in Kind and Use of Fishing Gear (Agenda item 4b)

14. The importance of accurate information on changes and trends in the kind of fishing

gear used in the fisheries in the ICNAF area, specially with regard to the measurement of changes in fishing effort and selectivity, was stressed. The Subcommittee accordingly

recommends (26)

that countries be urged to follow all major developments and changes in the gears used in their fisheries in the ICNAF area, and bring their findings in Meeting Documents to the notice of the Research and Statistics Committee. The notice of the Assessments and Statistics Subcommittees is also drawn to this important question.

15. The need for up to date information on new instruments for measuring gear dimensions and performance whilst fishing was also raised. The Subcommittee therefore noted with great interest the recommendations of the FAO Advisory Committee on Marine Resources Research concerning the standardization and intercalibration of methods and instruments used in research on living marine resources (as given on p.3 of Annex to 1963 Document No.66).

Variability of Selection Factors and Selection Ranges (Agenda item 4.i)

16. The Subcommittee's attention was drawn to the need for information on the variability of the estimates of selection factors and selection ranges used in Mesh Assessment work. It accordingly

recommends (27)

that workers in this field should pay special attention to the variability of selection factors and selection range, with special reference to the application of appropriate statistical methods for their estimation.

Studies on the relation between selectivity and catch size (Agenda item 4.d)

17. The Subcommittee noted the results of an analysis of data from Canadian alternate haul experiments for haddock in Divisions 3.O and 3.N on the relation between selectivity and catch size. (1963 Doc. No.53). These showed that the selection factors decreased only slightly with increase in catch over a wide range of catch sizes (a decrease of about 0.1 per 1 1/2 tons). English covered net experiments on cod in the Barents Sea (ICES.CM.1957. Doc. No.117) gave a similar result. The Subcommittee therefore concluded that for haddock and cod catch size has no major effect on the selectivity estimates used in mesh assessments. However, as reported at the 1962 Annual Meeting (Redbook 1962, Part I, App. VII), further information on this relationship for redfish is needed, and it is again

recommended (28)

that countries examine their redfish selectivity data in an endeavour to ascertain more precisely the effect of catch size on selectivity in this species.

ICNAF MESH SELECTION SUMMARY

Species.....Gear.....

AREA:

Author and/or Source	Locality (ICNAF Div.)	Date (Month and Year)	Trawl type and size (1)	Speed of Tow	Material (2)	Runnage (3) (yds. per lb. or m per kilo ply)	Method (4)

Mesh Size (mm)	Gauge used (5)	Mean and variation of selection factor	Range 75-25 (cm)	No. of Hauls	Total (6) No. Fish Exp. Species C.E.	Cv.	Mean Wt. or No/Tow (7) all species	Mean Haul Duration (min)

Notes to accompany form:

1. A full specification of the trawl used in the experiments should, if possible, be provided. In particular, headrope and footrope length and range of mesh size throughout the trawl should be given.
2. Description of material. The construction and braiding of the twine should be specified (e.g. mono or polyfilament twine, single and double braiding, etc.)
3. Length-weight equivalent of twine and the ply (number of main strands).
4. State if covered, alternate or parallel haul. For covered net experiments specify whether topside or whole covers are used.
5. Pressure of gauge to be specified.
6. Record the numbers of the single experimental species taken in the codend (C.E.) and cover (Cv.).
7. Record mean weight (in kilos or lbs) per tow or total numbers of fish per tow of all species caught.

APPENDIX IV - REPORT OF WORKING GROUP ON TAGGING

Chairman, Mr. S. Horsted; Rapporteur, Dr.W.R.Martin

Cards for Reporting Releases (Agenda Item 9a)

The Tagging Group noted that the card system for summary reporting of tag and sea-bed drifter releases has been adopted by ICNAF and ICES countries. Although it is too early to judge the value of this arrangement, a number of countries expressed satisfaction with it.

In discussion a number of points were noted as means of improving the efficiency of the reporting system, and it is

recommended (29) that

(a) Releases made in the ICNAF area should be reported to ICNAF and releases in the ICES area to ICES. For releases in the waters around Greenland and Iceland the Secretariat should collaborate with the ICES Secretariat in distributing release data to member countries.

(b) The ICNAF Secretariat should distribute release summaries on multigraphed sheets.

(c) Definition of release localities should describe the general tagging area, without being so precise that large numbers of cards are required to report releases. It was suggested that a latitude-longitude grid system would be helpful in defining release areas, if such a scheme is developed for other purposes.

Other Matters (Agenda item 9b)

1. Marking Symposium. The group noted that the special publication on the 1961 Marking Symposium has reached the second proof stage, and will be distributed this calendar year.

2. ICES Tag Inventory. The group endorsed the proposal by ICES that ICNAF collaborate in the early publication in the Journal du Conseil of a paper on the types of tags used in the North Atlantic area. It was noted that action has already been taken by Canada and the United States to provide ICES with appropriate information.

3. Low Tag Returns. Canada expressed concern over the low and uneven distribution of tag returns from countries fishing in the ICNAF area. To consider this problem, a small group consisting of one representative from each country reviewed the national systems of collecting tags, in an attempt to find weaknesses in them.

Although this review showed that all ICNAF countries have programs of advertising releases, payment of rewards, and provision of information on each returned tag, it was clear from discussion that the efficiency of tag recoveries varies much and often is far below that which would be desired. Special experiments in planting tags have demonstrated this very clearly. It was also apparent that the number of recoveries is related to the amount of energy devoted to the problem of ensuring tag returns. Those countries carrying out tagging programs appeared to have best success in collecting tags from the fishing industry.

It was apparent that member countries are aware of the importance of making propaganda among their fishermen to ensure the reporting of recaptures and of making this reporting as easy as possible for the fishermen.

Attention is drawn to the good results obtained by use of posters, letters to every fishing vessel, paying of reward as soon as possible (eventually on board the ship) and information to the fishermen about release data of their recaptures. The working group also noted that lotteries give good results. It is accordingly

recommended (30) that

(a) member countries prepare a short written report of their propaganda and reporting system for next year's meeting.

(b) member countries make analysis of their tagging experiments so as to discover weakness in the reporting systems (see Poulsen, 1957 Doc. No.4; Horsted, 1961 Marking Symposium) and where possible make seeding experiments (see Margetts, 1961 Marking Symposium).

4. Co-ordination of national tagging programmes in the ICNAF area. R & S agreed that closer co-ordination of national tagging programmes in the ICNAF area would be desirable, and accordingly

recommends (31)

(a) that opportunity be taken during each annual meeting of R & S to discuss and co-ordinate projected tagging programmes for the coming year, so far as these can be anticipated at the time.

(b) that special reference to dates, localities and objectives of projected tagging operations be included in national research programmes when these are submitted to the Secretariat at the beginning of each year.

(c) that if, later in the year, more detailed plans of tagging operations can be stated, these be sent to the Secretariat for immediate circulation to all member countries.

APPENDIX V - REPORT OF THE ENVIRONMENTAL SUBCOMMITTEE

Chairman: Dr.C.E.Lucas

Clashes with other Subcommittee meetings prevented full representation of member countries, but most were represented for at least part of the meetings. The principal discussions concerned plans for the Environmental Symposium, the ICNAF Environmental Survey, environmental aspects of national and international programmes and interrelationships with other international bodies.

1. Environmental Symposium

By arrangement a working group, comprising Lucas (Chairman), Lauzier, Templeman, Hansen and Lee (Convenors), Graham and Krefft (members of the Aberdeen Working Party), Dr. Ruivo (FAO) and the Executive Secretary, met in advance to consider further plans. Their report with its recommendations was accepted in full and is as follows:

The Symposium is now planned to extend over January 27th, February 1st, 1964, by invitation of FAO, in Rome, with a preliminary meeting of Chairmen and Convenors on Sunday, January 26th.

In addition to the sections prescribed earlier (Annex 1), the current interest in fishing for offshore herring of the ICNAF area, and the proffer of several papers, suggested the advisability of increasing this number by one. It is accordingly

recommended (32)

> that a section of the Symposium be given to "Herring and the Environment in the ICNAF area" and that Mr.B.E.Skud be invited to convene the section meeting and to solicit further papers from appropriate scientists.

There is still considerable uncertainty as to the size of the Symposium, but synopses for over sixty papers have now been received and titles have been proffered for over forty more; unfortunately, the absence so far of synopses for the latter makes their allocation to sections uncertain. Several of the sections already promise to be of considerable size; allocation of the remaining papers to sections will be the responsibility of the Chairman in consultation with the appropriate convenor and the Executive Secretary. Bearing in mind that all sectional papers are to be circulated for reading in advance of the Symposium, which will be devoted to reviews, discussion and planning, the great importance of providing papers in good time for duplication is stressed (preferably by September 1st, 1963). Although it may be possible to accept papers which have been duplicated privately (according to the instructions issued in January, 1963) at a later date, it is essential that such late papers, supplied in batches of 175 copies be made available for the Executive Secretary to issue before the end of 1963 and preferably by the end of November. There will not be time for sectional papers to be read during the meeting in Rome. These instructions do not, however, apply to the

papers to be provided by the Special Lecturers, but it is requested that they should be available at the meeting ready for printing.

The question of eligibility for attendance at the Symposium was raised and it is

recommended (33)

that attendance at the Symposium shall be open to all ICNAF and ICES scientists, to representatives of recognized fishery and marine research bodies, and to such others whose applications shall be approved by the Chairman of the R & S Committee, the Chairman of the Symposium and the Executive Secretary.

It is noted that the Commission has agreed to pay the travel and subsistence expenses of the Chairman, Convenors and Special Lecturers up to a sum of $4,000, although the Commission hopes that in most instances their expenses will be covered by their Governments. While there is as yet no certainty on the latter point, so far there are only one or two instances in which it is known that the Government is unlikely to cover the expenses. There remain, however, (a) additional expenses the Secretariat will incur in duplication of contributions, etc. and the (b) incidental expenses which may be incurred in Rome over and above those covered by the hospitality of FAO, and it is

recommended (34)**

that the sum of $4,000 be retained in the estimates to cover these expenses in addition to the probably reduced expenditure on travel, etc. It is also hoped that, if the Executive Secretary should be instructed to visit European countries during 1963-64, his itinerary might be so organized that he may also attend and assist with the Environmental Symposium.

The working group wishes to stress the great importance of all contributors being enabled to attend the Symposium, and requests that the Research and Statistics Committee might urge this need once again to Commissioners, so that requests for their attendance should be received by the responsible Governments with the maximum favour.

Uncertainty as to the ultimate size of the various sections makes it impossible to plan a final time-table for the meeting in Rome, but a draft is attached (according to present evidence) including the proposed section on herring. It is visualized that the daily time-tables might be 9-12:30 a.m., 2-5:30 p.m. and when special evening lectures are prescribed, 6-7:30 p.m., so as to conclude the normal programme before dinnertime. It is hoped to include an interim general report on the results of the ICNAF environmental survey, and any papers describing results in more detail will be welcomed by the appropriate section.

It is noted that the Commission have already agreed in principle to the publication of the results of the symposium. Unfortunately, it is still impossible to estimate the likely expenses in any detail, but it is

recommended (35)**

that contributions to and proceedings of the Environmental Symposium be published in the "Special Publication" Series (at the larger size) and that a sum of $7,500 should be allocated in the first place, for the year 1964-65.

Various other matters concerning the Symposium were discussed and general views expressed for the guidance of the Executive Secretary who will in due course be responsible for their execution. Draft timetable of the Symposium is attached as Annex 1.

2. Reports on environmental work

(a) Interim report on ICNAF Surveys Norwestlant 1-3.

The Co-ordinating Committee for the surveys, appointed at the Moscow meeting of ICNAF in May, 1962, met in Copenhagen on October 8-9, 1962, under the chairmanship of Mr. Lee, to make final plans for the surveys. As a result of this meeting and subsequent correspondence between the committee members, a Guide Book to the surveys was issued by Mr. Lee in February 1963. This was sent to all participating research vessels, to cruise leaders and to all interested scientists, as well as to organizations such as FAO, IOC, ICES, etc.

Mr. L. V. Worthington of the Woods Hole Oceanographic Institution kindly made available data collected by him during the ERIKA DAN cruise in the Labrador and Irminger Seas and the Davis Strait in 1962. These data have been of great assistance to various scientists in planning their cruises and the Environmental Sub-Committee is grateful to Mr. Worthington for his most generous assistance.

The C.O.D.C., Ottawa, has generously offered to process automatically all the hydrographic data collected during the surveys and in January 1963 Mr. C. Sauer made a tour of participating countries to make the necessary arrangements (See below under Data Centres). The survey data can thus be processed and issued in print-out or punch-out form to all participants and to ICES, NODC and the W.D.C.'s, etc. within 6 1/2 weeks of receipt at C.O.D.C. The Environmental Subcommittee is most grateful to C.O.D.C. for this very valuable service.

NORWESTLANT 1 was carried out in April-May, by vessels of France, Norway, the United Kingdom and the USSR. The French research vessel THALASSA visited England before beginning its cruise and similarly the Russian research vessel ACADEMICIAN KNIPOVICH visited Denmark, England and Iceland. The visits ensured the best possible co-ordination between the participating scientists on the various vessels. A brief report on the findings of the UK research vessel ERNEST HOLT as far as cod eggs and larvae are concerned is given in 1963 Document No.65. All cruise leaders have been asked to circulate similar brief reports on their cruises as soon as

possible after their completion to the other participating scientists. During NORWESTLANT 1 a rendezvous between the UK, French and USSR research vessels was achieved and comparative biological and hydrographic observations were made. It is hoped that similar meetings can be arranged by other vessels during NORWESTLANT 2-3.

NORWESTLANT 2 is at present under way, with the vessels of Canada, Denmark, Germany and Iceland.

NORWESTLANT 3 takes place in July.

In receiving Mr. Lee's report, the Subcommittee expressed their appreciation of his efforts and those of all his colleagues in promoting this important ICNAF project.

(b) Plans for the working up of material collected during ICNAF Surveys NORWESTLANT 1-3

The Environmental Subcommittee discussed these and

recommends (36)** that

(a) The main aspects of the survey to be worked-up and reported upon should be (1) fish eggs and larvae (2) hydrography (3) zooplankton (4) phytoplankton.

(b) Each country should, if possible, work-up its own material (but not (4) as Germany has already agreed to work-up the whole of this) and complete its report by 1 January 1965; it should present if possible an interim report to the ICNAF meeting in 1964.

(c) A co-ordinating team should then study and integrate the national reports and submit them with a report upon the survey as a whole to the ICNAF meeting in 1965.

(d) These reports should be published in the ICNAF "Special Publication" Series (large size with provision for folded maps and diagrams), although it is not thought that the publication date can be before 1965-66.

(e) The participants in the surveys should aim to meet during the ICES meeting in Madrid in October, 1963, to decide (1) the form which the national reports should take for convenience in integration; (2) the amount of detail in which the zooplankton collections should be worked-up and (3) what assistance can be given to countries which cannot work-up the whole of their material; members of the co-ordinating team should if possible be appointed then.

(b) A scientific paper or papers be published describing the different types of "sea-bed drifters".

(c) The release of such "drifters" be circulated to relevant laboratories in the same manner as for fish tags, but on separate cards appropriately distinguishable.

(d) Member countries in collaboration with the Secretariat provide publicity notes suitable for members of the fishing industry and supply them to "Canadian Fisherman", "France Peche", "Commercial Fisheries Review", "World Fishing", "Fishing News International" and appropriate national fishery journals.

(e) A similar note be supplied for the FAO/UNESCO Newsletter.

(f) Member countries in collaboration with the Secretariat design a poster suitable for publicising "drifters" in fish markets.

(g) These recommendations be brought to the attention of ICES, both in relation to their proposed publication on fish tags and for the information of their Hydrographical Committee.

In considering the extensive Canadian hydrographic programme, reference was made to the I.O.C. plans for collecting information about standard oceanographic sections and it was

recommended (38)

that member countries might be asked to supply ICNAF with duplicates of the information being supplied to I.O.C., to provide a basis for a revision of the Commission's own records.

Other discussions led to endorsements of the value of the benthic studies now in progress, as well as the potential value of further studies of the interrelationships in abundance of fish and other species. In conclusion, general satisfaction was expressed about the various ways in which the ICNAF environmental programme of 1961 is being implemented.

(d) Continuous Plankton Recorder Survey

The C.P.R. survey has been strengthened to provide a new route from the United Kingdom to Cape Farewell, with the help of the Royal Greenland Department of Trade, and in 1962 over 18,000 miles of sampling was recorded. Further extensions were expected in 1963 with the aid of a grant from the U.S. Office of Naval Research (Docs. 19 and 20).

3. Relations with other bodies

The Chairman told the meeting that a separate report (Doc.47) on the work of ICES especially relevant to ICNAF problems was being presented to the R & S Committee. Regarding FAO, he reported that the Director General had now convened the Advisory Committee on Marine Resources Research, envisaged at the previous meeting of the Environmental Subcommittee, and that the Committee had had its first meeting early in 1963. While its members are appointed in a personal capacity, so that it was not possible for Dr. Lucas to serve on it as the ICNAF representative, as recommended last year, the members were selected with their experience of the work of the various regional fishery bodies in mind, after consultation with such bodies. Two of its members, (Dr. Needler, Chairman, and Dr. Lucas, Vice-Chairman) were past Chairmen of the ICNAF R & S Committee and its Secretary (Dr. Ruivo) was a third.

The Chairman briefly reported on several activities of the Intergovernmental Oceanographic Commission of special concern to ICNAF and particularly relative to the ICNAF reply in 1962 to the IOC request, for collaboration. First, and of great importance to all intergovernmental regional fisheries bodies, was the fact that IOC had now arranged to invite such bodies to participate in its meetings and to propose items for their agenda.

Of equal significance, IOC had designated the ACMRR of FAO (see below), together with two additional members from the USSR, as its advisory body on the fisheries aspects of oceanography. This should ensure that advantage can be taken for fishery research objectives of the many oceanographic advances being co-ordinated by IOC. These include important developments ranging from the standardization and intercalibration of oceanographic techniques, and of data exchange, to international synoptic investigations of the North Atlantic within a comprehensive programme for world ocean study. In particular, the ICNAF Environmental programme was welcomed and visualized as a part of the first stage in such comprehensive plans for ocean studies. Specifically, the IOC Resolution runs:

> "The Intergovernmental Oceanographic Commission: Welcomes the interest and good wishes expressed by ICNAF in their letter of 7 September (Doc.NS. IOC.INF.27) and particularly welcomes their desire to co-operate with the Commission, as already shown by the information provided concerning their environmental programme in general and their projected surveys of the waters around Greenland, during 1963, in particular;
>
> Recognizing the fishery objectives of these programmes, the Commission notes also how they may be expected to contribute directly to the objectives of basic oceanographic studies on the north west Atlantic Ocean.
>
> Recommends that members of IOC concerned with these regions give all possible assistance to the ICNAF programme, and
>
> Requests the Secretariat to keep ICNAF informed of any proposals for oceanic research covering or overlapping the ICNAF area."

The Chairman then invited Dr. Ruivo to review (Doc.66) recent FAO activities of especial environmental interest. A number of these concerned resolutions from the IOC meeting on which the advice of ACMRR had been sought. In particular, the Subcommittee noted the action taken by ACMRR in their recommendations 5 & 6, on standardization and intercalibration and on the production of synopses of scientific information, respectively, and welcomed the action proposed by recommendations 10 & 12 as regards the IOC comprehensive programme for world ocean study and the investigation of the northern ocean; the hope was expressed that FAO would kindly keep ICNAF informed on these matters and it was decided to ask the Executive Secretary to send to FAO a copy of the ICNAF report and programme on environmental studies, for the information of the relevant ACMRR working party. The Subcommittee further noted ACMRR recommendation 15 & 16 concerning the rapid utilization of oceanographic data and data exchange and appreciated the information provided about the ICSU plan for the International Biological Programme and particularly the steps taken to ensure that there should be no overlapping with the programme of existing international bodies.

Special attention was given to the FAO proposal to hold a world symposium on "Fishery Oceanography" and the view of ACMRR that this should be deferred until the 1966-67 biennium. The value of such world meetings was recognized and this one in particular was noted as appropriate in relation to the Environmental Symposium of ICNAF. The view of ACMRR was endorsed, however, in view of the possibility that the Second Oceanographic Congress may be held in 1965 or 1966; it was felt that this FAO Symposium might reasonably be deferred until 1967. It is further earnestly hoped that every endeavour will be made to avoid any undesirable clash of either effort or objective between the two proposed meetings.

Lastly, information regarding progress being made in publishing the Serial Atlas for the Marine Environment was noted and approval was expressed regarding the ACMRR proposal to invite ICES to consider organizing a symposium on dynamic models of marine communities, through various trophic levels, in relation to environmental conditions.

Finally, Mr. Lee reported on Data Centres.

The present arrangement for reporting hydrographic data for the ICNAF area is that European countries should send them to the ICES data centre in Copenhagen and that the N. American countries should send them to NODC, Washington or CODC, Ottawa. As these three data centres exchange data between themselves and also with World Data Centres A & B, it follows that the ICNAF area data become readily available to the world's oceanographers. The IOC has a working group on data centres meeting about once a year and ICES, NODC, CODC and the WDC's are all represented on this group, so that problems concerned with punched card codes, data exchange, etc. can be readily discussed and resolved.

It should be noted that as a result of an IOC resolution, there is a developing tendency for national data centres to be set up, e.g. a British Oceanographic Data Centre is now under consideration. This may cause some problems in the future, but at present ICNAF oceanographers are admirably placed with regard to data centres.

In closing the meeting the Chairman thanked all those concerned for their help during the year, in preparing for the Survey and the Symposium, and those present for their help in dealing with an unusually large mass of information.

Annex 1. Draft Programme for the ICNAF Environmental Symposium
January-February, 1964

	Morning (9:00-12:30)	Afternoon (2:00 - 5:00)	Evening (6:00-7:30)
Sunday	Discussion with Conveners, final planning, etc.		
Monday	Dietrich, Lee	Lee	Ahlstrom
Tuesday	Glover	(Glover) Templeman	Schaefer
Wednesday	Hansen	Skud	Parrish
Thursday	Hempel	(Hempel) Marty	-
Friday	Lauzier, Bumpus	Free (unless required for morning extension)	-
Saturday	Discussion - Approach to environmental research, planning, report, etc.		-

Special Lecturer	Title
Dr. Dietrich, Kiel	"A review of the hydrography of the area"
Dr. Ahlstrom, La Jolla, California	"The Pacific sardine"
Prof. Schaefer, La Jolla	"The tuna"
Mr. Parrish, Aberdeen	"The herring"

Convener	Title
A. Mr. Lee, Lowestoft	"Effect of physical environmental conditions on the distribution of adult fish (i.e. immediate and seasonal effects)".
B. Mr. Glover, Edinburgh	"Effect of environment on pelagic and early demersal stages of groundfish".
C. Dr. Templeman, Newfoundland	"Effect of the biological environment (including parasites) on the distribution of adult fish."
D. Dr. P. Hansen, Denmark	"Effect of the environment on the growth, survival and age and size at first maturity."
E. Mr. Skud, Boothbay Harbour, USA	"Herring and the environment in the ICNAF area."
F. Dr. Hempel, Germany	"Physiological reactions to changes in the environment."
G. Dr. Marty, Moscow	"Effects of the environment on the process of fishing."
H. Dr. Lauzier, St.Andrews, Canada	"Effect of long-term trends"
I. Mr. Bumpus, Woods Hole	"Forecasting environmental conditions."

APPENDIX VI - REPORT OF THE STATISTICS SUBCOMMITTEE

The Statistics Subcommittee was convened under the Chairmanship of Mr. R. Hennemuth, with Mr.B. F.Calvin DeBaie as rapporteur. All countries were represented at the meeting. Most items of the agenda were dealt with by the main Subcommittee but two working groups were set up to deal with those items requiring detailed study.

1. Statistical Bulletin

The Subcommittee reviewed the decisions made at the 1962 Annual Meeting concerning the format of the Tables in the Statistical Bulletin, and

recommends (39) that

(a) Table 1 should include all fin-fish species listed in Table 3 with annual landings over 500 metric tons. The species under "Shellfish, etc." now in Table 3 should be excluded from Table 1 with the exception of Scallops. This should be effective for Vol.11 (1961).

(b) Table 2 should include those principal species and grouped totals now listed in Table 4.

(c) The following species should be reclassified:

(i) Greenland Halibut to be moved from "Other Groundfish" to "Flounders"

(ii) Sharks, Skates, Rays and Dogfish to be moved to "Other Fish"

(iii) Billfish to be moved from "Other Fish" to "Pelagic Fish"

(iv) The Group captioned as "Shellfish" should read "Shellfish, etc."

(d) Noting the growing interest in tunas and the new exploitation of Great Silver smelt in the ICNAF area:

(i) Great Silver smelt (Argentina silus) should henceforth be included among the species listed separately in the ICNAF Statistical Bulletin.

(ii) Tunas should also be listed separately by species according to the nomenclature recommended by the CWP.

The Subcommittee noted that information on "number of days absent" and "number of trips" is not now obtained by the Commission from statistics Forms 1 and 2, as revised in 1961 and 1962. Hence, this information can no longer be included in Statistical Bulletin Table 5. This latter table now becomes a summary of effort and catch information contained in Table 4.

2. Dory Vessel effort statistics

The Portuguese effort category "Dory Hours" as published in Statistical Bulletin Volumes 6 to 11 for the years 1956-61 referred only to the "number of hours the dory fleet is absent from the mother vessel." These data have now been reported to the Secretariat in an amended form which conforms with the Commission's definition: namely, the "number of hours the dory fleet is absent from mother vessel times number of dories." The Subcommittee accordingly

recommends (40)

(a) That the amended data of "Dory Hours" be published as appendices to Vol.11 of the Statistical Bulletin for the year 1961,

(b) that the amended data for the year 1962 be published as an appendix to Vol.12 of the Statistical Bulletin for the year 1962.

3. Statistical Reporting

(a) The Subcommittee noted with regret the lateness with which the 1961 Statistical submissions of some member countries were received at the Secretariat, and also the number of member countries who have not as yet supplied the Secretariat with preliminary statistics for 1962 required for this meeting. It therefore

recommends (41)

again that when complete statistics cannot be reported by the May 1st deadline, a summary and, if necessary, preliminary estimated statistics by species and subarea (and, if possible, by division) should be reported by that date.

(b) The Subcommittee reviewed the mechanics of the production of the Statistical Bulletin with satisfaction and is of the opinion that the present method be continued so long as timely reporting is maintained thereby.

4. Redfish Statistics by Depth Zones

The Subcommittee reviewed the 1962 reports of redfish catch by depth zones in the light of last year's recommendation which requested that countries, in reporting redfish statistics by depth zones make an analysis of them, with a view to assessing their usefulness and the possible need for alternative depth stratification.

The USSR was commended for their research reports on this subject, which were submitted at this Annual Meeting. The Subcommittee

recommends (42)

that countries which are able to report catch and effort, and length data, for redfish by depth zones do so in the next year. Countries are also encouraged to make special studies of the relationships between these data and submit them as meeting documents at the 1964 Annual Meeting.

The UK (Mr.R.J.H.Beverton) offered to do studies on existing data. The USA offered to analyse their long term collection of data. Canada offered to make a start on this type of study. The USSR agreed to continue their work on this problem.

5. Statistical Forms

The Subcommittee reviewed the 1962 Statistical Forms 1, 2 and 3, which had been revised slightly to conform with the new content of the Statistical Bulletin and approved the revisions.

6. Preliminary Statistical Releases

The Subcommittee considered the suggestions made by the Secretariat, providing for the early release of mimeographed Tables of the Statistical Bulletin and :

recommends (43)

that the drafts of Tables 1 and 3 of the Statistical Bulletin be reproduced by the Xerox method for early distribution to all member countries.

7. List of Fishing Vessels

Data submitted for the 1962 List of Fishing Vessels was reviewed. The Subcommittee

recommends (44)

that the Secretariat correspond with countries to obtain additional data on R.P.M. and propeller characteristics, if possible, and to include the additional data in the List of Fishing Vessels which is to be published this year. Special note was made of Mr. Traung's study of propeller characteristics and fishing power and the Secretariat is requested to send Mr. Mr. Traung the German data.

8. Subarea Effort Statistics - Form 3

It was agreed that ICNAF Form 3 supplies the Commission with summary statistics which reflect general changes in the level and distribution of fishing activity in the ICNAF area.

The Subcommittee therefore

recommends (45)

that during the coming year the Secretariat, in consultation with a representative of the Statistics subcommittee, prepare a format suitable for publication of these Form 3 data in the Statistical Bulletin, and summarize data for a recent period of two or three years in the suggested format. This summary is to be circulated to countries during the coming year.

It should be decided at the 1964 Annual Meeting if the summary does provide valuable information of ICNAF fishing activity, and if so, consider where and how best to publish it.

Special difficulties arose during the discussion of the interpretation of the last four columns of Form 4, and the group felt that the purpose of these columns is to furnish an estimated breakdown of the more important species that may be converted into fish meal, animal food, etc. The total of such "industrial" fish landings are reported in Table 3 of ICNAF Statistical Bulletin under "species not stated (industrial)". When the weights shown in the last 4 columns of ICNAF statistics Form 4 are considered for publication, special care should be taken so that they are not added to the statistics which have already been reported as "species not stated (industrial)."

If the statistics of the year 1963 are not available, the Group

recommends (49)

that countries use the statistics for discards and industrial fish of previous years for the first trial with the new Form 4 in time for report to the next Annual Meeting.

The Group

recommends (50)

that the list of conversion factors required under point 2 of the instructions for completing ICNAF statistics Form 4 should be published in the Statistical Bulletin.

10. Consideration of the Report of the Continuing Working Party (CWP)

The Chairman briefed the Subcommittee concerning those matters arising from the Third Session of the Continuing Working Party which was held in Rome March 18-22, 1963 and proceeded to consider the proposals of this report.

(a) Standard Terminology and Definitions

The Subcommittee

recommends (51)

that the present ICNAF definitions of "number of trips", "days absent", "days fished", "days on grounds" and "hours fished" be retained. If, however, searching is a substantial part of the fishing operation, days on grounds in which searching but not fishing took place, should be included in the days fished data.

(b) Statistical Areas

The Subcommittee reviewed the proposal of the CWP which outlined the extension of the Area of ICNAF's statistical responsibilities to the southward and

recommends (52)

that ICNAF should not extend its statistical boundaries.

The Subcommittee considered the proposal of the CWP to eliminate the duplication in collection of statistics for Subarea 1 by both ICNAF and ICES. It

recommends (53)

that the ICNAF Secretariat provide ICES with landings statistics for Subarea 1 if ICES should desire this arrangement.

The Subcommittee

recommends (54)

that the Secretariat make a survey of geographical grid systems now in use by various countries for the ICNAF and ICES area, so that the Committee can next year consider the establishment of a general grid system to cover subdivisions of the present Divisions.

(c) Consideration of common and scientific names of fishes

A group of three specialists reviewed the comparative list of common and scientific names of fishes used by ICNAF and ICES.

The Subcommittee

recommends (55)

that the following changes in ICNAF's list of species names in the Bulletin be made:

LIST OF CHANGES IN SPECIES NAMES

Present ICNAF Names

Common	Scientific
Sturgeon	Acipenser oxyrhyncus
Trout	Salvelinus spp.
Yellowtail	Limanda ferruginea
Fluke	Paralichthys dentatus
Pollock	Pollachius virens
Anglerfish	Lophius americanus
Sand Eel	Ammodytes spp.
Striped wolffish	Anarhichas lupus
Spotted wolffish	Anarhichas minor
Conger	Conger oceanica
Eel Pout	Macrozoarces americanus
Scup	Stenotomus versicolor
Sea Robin	Prionotus carolinus
Swellfish	Sphaeroides maculatus
Billfish	
Tuna	Thunnus thynnus
Dogfish	Squalus & Mustelus spp.
Prawns	Pandalus borealis
Hard Clam	Mercenaria mercenaria
Ocean Quahog	Arctica (Cyprina) islandica
Mussel	Mytilus edulis
Periwinkles	Littorina and Lunatia spp.

Recommended ICNAF Names

Common	Scientific
Sturgeons	Acipenser spp.
Trout & Char	Salvelinus spp.
Yellowtail flounder	Limanda ferruginea
Summer flounder	Paralichthys dentatus
Pollock (Saithe)	Pollachius virens
Angler	Lophius americanus
Sand eels (Launces)	Ammodytes spp.
Wolffishes	Anarhichas spp.
Conger	Conger oceanicus
Ocean pout	Macrozoarces americanus
Scup	Stenotomus crysops
Sea robins	Prionotus spp.
Northern puffer	Sphaeroides maculatus

Recommended ICNAF Names (cont'd)

Common	Scientific
Billfish (Saury)	Scomberesox saurus
Tunas	Thunnus spp.
Dogfishes	Squalus & Mustelus spp.
Prawn	Pandalus borealis
Quahog	Mercenaria mercenaria
Ocean quahog	Arctica islandica
Mussels	Mytilus & Volsella spp.
Periwinkles	Littorina spp.

N.B. All changes underlined

The Subcommittee further

recommends (56)

that the complete revised list of common and scientific names of species be sent to ICES for the information of its Statistical Committee.

(d) Common Reporting of North Atlantic Fishery Statistics

Dr. Martin reviewed the present reporting procedures and requirements of ICNAF, ICES and FAO. All countries commented on procedures of their national reporting offices, and expressed their opinions on the desirability of standardized reporting forms. Most countries which report both to ICNAF and ICES expressed the opinion that a common format was, indeed, desirable.

The differences between species groupings now used by ICNAF and ICES-FAO in their publications were outlined. The advantages of several alternative species groupings for ICNAF's publications were discussed, and in particular the species grouping proposed by the CWP at its recent meeting (1963 Doc.11, Appendix VI).

The Subcommittee

recommends (57)

that some revision of the species sub-grouping similar to that proposed by CWP in the report of its 3rd Session is desirable for ICNAF's publications, but that some further study and time is needed to implement this course of action.

The Subcommittee

recommends (58)

that a revised version of STANA Form 1W, as illustrated in the report of the third session of CWP, be prepared for use in 1963 by those countries wishing to do so. The species groupings on the form are to follow that of the revised list in the CWP report, which includes the various sub totals required for the ICNAF's Bulletin (except see Section 1). In order not to increase unduly the workload of Canada and the Secretariat in preparing the 1963 statistics, Canada and the U.S. agreed to continue to use the present ICNAF statistical forms for the 1963 statistics.

The new STANA 1W form is to be prepared and circulated by FAO to those countries desiring to use it, and the Secretariat and the Chairman of the Statistical Subcommittee are to ensure that the proper effort categories as specified on ICNAF Stat. Form 1, are included on the new form.

The Committee accepted with appreciation Mr. Gertenbach's offer to prepare the new STANA 1W form.

(e) Co-ordination of statistical reporting among ICNAF, ICES and FAO

The Subcommittee considered the future functions and status of the CWP, set up by FAO to implement the recommendations of the 1959 Edinburgh Conference on Statistics and

recommends (59)** that

(a) the CWP should remain in existence, as being the best means of providing the essential liaison between the three international agencies (ICES, ICNAF, FAO) responsible for compiling and publishing North Atlantic fishery statistics;

(b) the interests of ICNAF would be best served if the composition of the CWP included one member of each of the Secretariats of ICNAF and ICES, and the Chairmen of the Statistical Committees of the two agencies.

(c) since the initial trials of common reporting forms by the four "guinea-pig" countries (Canada, Germany, Iceland and UK) have now been completed, the continued participation of these four countries was perhaps no longer necessary;

(d) in order to maintain effective collaboration between the three agencies concerned with fishery statistics in the North Atlantic, the activities of the CWP should continue to be confined to this region;

(e) these views, if approved by the Commission, be transmitted to ICES and FAO with the request that their views be made known to ICNAF.

APPENDIX VII - REPORT OF WORKING GROUP ON SAMPLING

1. The Working Group met on Wednesday, 28th May, under the Chairmanship of Mr. B.B.Parrish. Representatives from most member countries attended the meeting.

Publication of Sampling Data in Sampling Yearbook

2. The Working Group examined the contents of the Sampling Yearbook, Vol.6 for 1961, which had been completed in accordance with decisions taken at the 1962 Annual Meeting (Redbook 1962, Part I, App.XI). It noted that the decision not to include age/length keys in the yearbook, but file them in the Secretariat had achieved a large reduction in the size of the yearbook, from two (Vol.5) to one volume. Notwithstanding, there was general agreement that age/length keys are of vital importance and that every attempt should be made to reintroduce them in a condensed form in the Yearbook. Detailed consideration was therefore again given to the grouping of data to be published in the yearbook, noting the proposals in 1963 Doc. No.48 by Mr. Gulland, concerning possible ways of condensing age/length keys.

3. The potential saving in space and cost of such condensation was noted, but it was agreed that before further decisions should be taken on changes in the form and degree of condensation of the length and age data published in the Yearbook, detailed analyses of past sampling data should be undertaken. The Working Group accordingly

recommends (60) that

(a) subject to the recommendations in para 4, no changes should be made in the type and form of publication of sampling data for 1962, to appear in Vol.7 of the Sampling Yearbook. These should be collected and published in accordance with the recommendation of the 1962 Annual Meeting (Redbook 1962, Part I, App.VI).

(b) during the coming year analyses should be made of all available sampling data of both length compositions and age/length keys for the major fisheries in the ICNAF area, with a view to determining the most appropriate grouping and degree of condensation of data for routine publication in the Yearbook, the results to be presented to the Research and Statistics Committee at its next Annual Meeting. It is recognized that the degree of condensation which may be possible or desirable for length compositions is likely to be much less than for age/length keys. The following countries promised to make these analyses:-

Canada	- Subarea 4, Cod and haddock
Portugal	- Subarea 4, Cod
UK & Denmark	- Subarea 1, Cod
USA	- Subarea 5, Haddock and cod
USSR	- Subarea 1, 2 & 3, Redfish

4. The attention of the Working Group was drawn to the difficulty in most countries of obtaining from the commercial catches length and age composition data for redfish for 50 fathom (100 metre) depth zones. The Group however

recommends (61)

that, in view of the importance of these data in conjunction with catch statistics, in redfish stock and fishery investigations, they should continue to be provided in this form wherever possible.

5. The Working Group also noted that in many of the tables appearing in the Sampling Yearbook, data on the weight and number of fish landed are not provided. The importance of these items of information was stressed, and countries are thereby urged to supply them when submitting sampling data to the Secretariat.

Sampling Methods Used in Member Countries

6. The Working Group noted the comments and proposals of the Workshop on Ageing Techniques (1963 Doc.3) on the possible importance of differences in sampling methods, as a factor contributing to observed differences between countries in the published age compositions for cod in Subareas 3 and 4. It examined in detail the information supplied by countries on their methods of age sampling, in reply to a questionnaire from the Chairman of Research and Statistics. This revealed that a variety of sampling methods are used, ranging from direct random sampling for age to stratified sampling and the use of age/length keys.

7. It was agreed that, of the methods available, stratified sampling for age, in association with large scale random length sampling is basically the most efficient. The Working Group therefore

recommends (62) that

(a) during the coming year all countries should examine their sampling methods, both of research vessel catches and of commercial landings from the ICNAF area, with a view to determining the relative efficiencies of different methods, and to adopting where possible the most efficient one. The results of these analyses should be reported to the next meeting of the Research and Statistics Committee.

(b) the Secretariat be asked to circulate to all countries copies of the replies to the Chairman's questionnaire, together with worked examples of the use of the stratified sampling for age.

8. The attention of scientists engaged in this work is drawn to the "Manual of Sampling Methods for Fisheries Biology" by Mr.J.A.Gulland soon to be published by FAO.

Variability of Sampling Data

9. The Working Group endorsed the comments and recommendations of the Assessments and Gear and Selectivity Subcommittee concerning the importance of information on the variability of estimates of abundance, selectivity, etc. and it

recommends (63)

that countries analyse the variability of replicate haul data in their possession, including the data collected during selectivity experiments, and report their findings to the next meeting of the Research and Statistics Committee.

Length Measurement

10. The Working Group noted that there are differences between the length dimensions used by different countries in routine length measurement; some countries measure fork length while others measure total length. The need for uniformity and comparability of the length data in the Sampling Yearbook and meeting documents was stressed and the Working Party

recommends (64) that

(a) consideration be given to the need for uniformity and comparability of length dimensions at the next Annual Meeting,

(b) factors for converting from fork length to total length (and vice versa) should be determined for the major species sampled in member countries, and reported at the next Annual Meeting.

11. The Working Group wishes to express its appreciation of the expeditious way in which the Biologist-Statistician had compiled the Sampling Yearbook for 1961.

APPENDIX VIII - REPORT OF AD HOC COMMITTEE ON NATIONAL RESEARCH REPORTS
(as amended by R & S)

Present: Graham (Convener); Rasmussen; Hansen; Krefft; Volkov; Parrish; Hodder; Hart; Beverton.

At the request of R & S, this ad hoc committee discussed the possibility of achieving a greater degree of uniformity in the presentation of national research reports, and

recommends (65)

(a) that the attention of all member countries be again drawn to the desired form and content of national research reports as recommended both at the 1962 Annual Meeting (1962 Redbook, p.13) and at this meeting.

(b) that the material for the national reports be arranged first by Subarea, and

(c) that under each Subarea the following outline be followed so far as is practicable:

A. Status of the fisheries

This should be broken down by species and should first indicate the changes that have taken place in the landings. There should then follow an explanation for these changes based on the scientists' best judgment. Included here would be reference to length and age compositions, changes in effort, availability and environmental conditions as are necessary and appropriate. Any forecasts for the coming year should be included here. Length and age composition data may be presented in graphic form if desired.

B. Special Research Studies

I. Environmental Studies

1. Hydrographic Studies
2. Plankton Studies (excluding fish eggs and larvae)
3. Benthic Studies
4. Other environmental studies

II. Biological Studies of Fish by Species

Material here should be presented in order of life cycle taking up studies of eggs and larvae first, then immatures and adults

III. Gear and Selectivity Studies, including studies of fishing operations.

IV. Miscellaneous studies

(d) that countries make every effort to submit their reports by the recommended date (March 31) or, failing that, to reach the Secretariat by April 30th, at the latest.

APPENDIX IX - SUMMARY LIST OF RECOMMENDATIONS REQUIRING ACTION BY MEMBER COUNTRIES DURING THE COMING YEAR

Explanatory note: Most of the recommendations of Section II and some of those of Section III fall to the Secretariat for implementation. The remainder concern plans for research or analysis and reporting of data to be undertaken by scientists of member countries; for ease of reference these are listed here, against the corresponding recommendation(s).

FROM SECTION II

Rec. 3	Scope of Gear and Selectivity Subcommittee.
Recs. 4 & 5	Herring and larger pelagic fish.
Rec. 12	Summaries of research
Recs. 13 & 65	Format of National Research Reports.
Rec. 14	Units of measurement in ICNAF publications.

FROM SECTION III

Assessments (App.I)

Rec. 16	Reliability of effort statistics.
Rec. 17	Detailed information on fishing operations.
Rec. 18	Graphical presentation of fishery trends.

Ageing Techniques (App.II)

Rec. 19	Applicability of standard terminology to redfish otoliths.
Rec. 20	Co-ordination of age-reading by means of otolith photographs.
Rec. 21	Validation of cod age-reading.

Gear and Selectivity (App.III)

Rec. 22	Studies on comparative selectivity of natural and synthetic twines.
Rec. 23	Compilation of tabular selectivity data.
Rec. 24	Compilation of length, weight and girth data.
Rec. 25	Redfish meshing.
Rec. 26	Reporting on new developments in fishing gear.
Rec. 27	Variability of selection factors and selection range.
Rec. 28	Relation between selection factor and catch size in redfish.

Tagging (App.IV)

Rec. 29	Reporting of release information on postcards.
Rec. 30(a)	Reporting of publicity and tag collecting systems.
Rec. 30(b)	Analysis of recovery efficiency.
Rec. 31	Co-ordination of national tagging programmes in ICNAF area.

Environmental (App.V)

Rec. 36	Working up of data from NORWESTLANT.
Rec. 37	Sea-bed drifters.
Rec. 38	Reporting of hydrographic data to ICNAF.

Statistics (App. VI)

Rec. 41	Timeliness of statistical reporting.
Rec. 42	Redfish statistics by depth zones: (See also App. VII, Rec.61)
Rec. 46	Sampling procedures for estimating discards.
Recs. 48, 49 & 50	Reporting of discard information
Rec. 58	Use of STANA form 1W.

Sampling (App. VII)

Rec. 60	Condensing of sampling data for publication in Sampling Yearbook.
Rec. 62	Efficiency of sampling methods.
Rec. 63	Variability of sampling data.
Rec. 64(b)	Fork length/total length conversion factors.