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Prof. Dr H. Mann
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Dear colleague,

In a letter of July 17th, Mr. Ole Christensen informed you that the publication of our "Reference Report on Baltic Salmon" is going to be discussed in a sitting of the Working Group in connection with the 62nd Statutory Meeting of ICES in Copenhagen.

Enclosed you find a copy of the final manuscript except the section: "Bibliography". The final copying for printing of this section will be discussed at the meeting.

Sincerely yours


Nils Johansson

*Copy for Kystbiolog,
me,
19.9.74.*

COOPERATIVE RESEARCH REPORT

No.

REFERENCE REPORT ON BALTIC SALMON
with additional information on Baltic sea trout

compiled by

the Working Group on Baltic Salmon

edited by

O. Christensen and N. Johansson

International Council for the Exploration of the Sea
Charlottenlund Slot, DK-2920 Charlottenlund
Denmark

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FOREWORD

The Working Group on Baltic Salmon was established in 1958 as a standing committee on Baltic salmon problems. At its 1st sitting it decided to compile available data as a basis for further studies because even if the object of the Working Group was that of a contact group for mutual information and stimulation as to studies of Baltic salmon, the desirability of some kind of report to be presented to the Salmon and Trout Committee of that time was immediately evident.

In 1962 at the 6th sitting of the group a program recommendation was made and the following year a draft of a "Progress Report no. 1" was presented and discussed. The outline of this report largely corresponded to the present Reference Report. As several items needed a more thorough treatment and especially as the prerequisites necessary for construction of a population model were not fulfilled, it was decided to look further into these questions, before a new draft was prepared. The completion of the work was however delayed, mainly because material for certain items of the report proved to be more or less inaccessible.

The presentation of this report is primarily due to dr. B. Carlin, the chairman of the Working Group for 10 years and the promoter of the activities of the group in general. He took the initiative, prepared the outline and made the greatest efforts to complete the report before he died in 1971.

Contributors to the report as listed below:

Denmark:	O. Christensen	Sweden:	B. Carlin
F.R. Germany:	R. Kändler		A. Lindroth
	F. Thurow		N. Johansson
Finland:	E. Halme		P.-O. Larsson
	J. Toivonen	USSR:	N.M. Lishey
Poland:	P. Chrzan		A. Mitans
	S. Zarnecki		
	R. Sych		

ACKNOWLEDGEMENT

This report was initiated in 1962 and has received help and encouragement from many sources. The editors wishes to express sincere thanks for the splendéd cooperations of all contributors and cooperators. We are especially grateful to K.A. Pyefinch, for so kindly reading the entire manuscript in order to bring it in accordance with correct English and for giving helpful advise on editoring the report.

EDITORIAL NOTES

As indicated by the title the object of the Reference Report is to supply basic information on Baltic salmon and to a certain extent on Baltic sea trout too.

Greater weight is attached to salmon than to sea trout because salmon, as a wider migrating species, is subjected to extensive exploitation far from home waters and consequently needs international cooperation in research and management to a far greater extent.

On the other hand, a variety of problems are shared by both species and also find common solutions; for that reason a partial inclusion of sea trout was thought to be reasonable. The existence in the Baltic of stocks of wide-migrating sea trout besides populations with more limited migration routes further supports this point of view. The wide-migrating sea trout - showing great resemblance to salmon not only regarding migration pattern, but also as to growth - originate in the river Vistula and in the West Pomeranian rivers. Besides giving rise to an important local fishery they are an important component of the off-shore salmon catches of several nations, as it is evident from the catch statistics, section 4. These are the reasons why special attention is devoted to sea trout in the Polish contributions to the present report.

Baltic salmon are considered to be the stock of salmon living in the Baltic Sea and in the connected gulfs and affluents, separated from the "true" Atlantic salmon by the Danish Belt Seas. Swedish tagging experiments have clearly demonstrated the small amount of overlapping of these two populations. Out of 114,000 recaptures resulting from smolt taggings in 1951-1970 in Swedish rivers running into the Baltic, only 0.4 % were reported from outside the Baltic area. The main part of these extra-Baltic migrants, or 0.3 % of the total recaptures was taken between the Danish Islands. Correspondingly the proportion of recaptures in the Baltic from tagging experiments

with Atlantic salmon on the Swedish west coast in 1966-1970 amounted to 0.8 %. (Personal communication from the Salmon Research Institute, Sweden).

Fig. 1 shows the area of distribution of Baltic salmon.

70

THE BALTIC AREA

Rivers supporting salmon runs indicated.

68

66

64

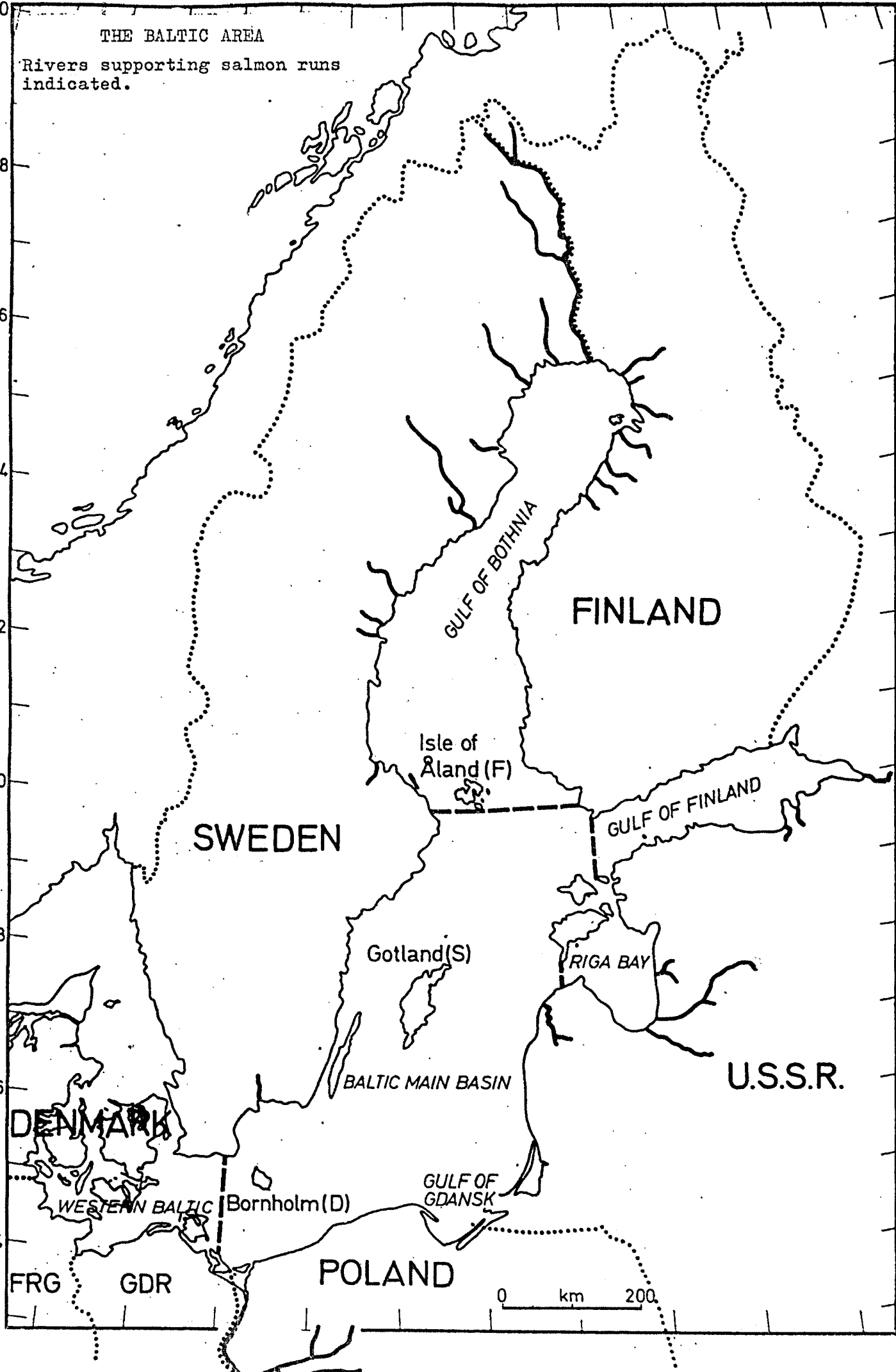
62

60

58

56

54



SWEDEN

FINLAND

Isle of Åland (F)

GULF OF FINLAND

Gotland(S)

RIGA BAY

U.S.S.R.

BALTIC MAIN BASIN

DENMARK

GULF OF GDANSK

Bornholm(D)

WESTERN BALTIC

FRG

GDR

POLAND

0 km 200

SECTION 1 INTRODUCTION

1.1. Review of Baltic salmon management problems

Until the 20th century the study of Baltic salmon was the object of a few scientists, amateurs and fishery administrators. During 1860-70 interest in artificial fertilization of salmonids - a technique at that time rediscovered in France - arose and hatcheries were established in some rivers in an attempt to supplement the natural production. The decline of the stocks of Baltic salmon about the end of the century however gave the decisive impetus to salmon research.

In 1903, the year after the foundation of the International Council for the Exploration of the Sea, a subcommission within Commission C for the Baltic area was formed under the leadership of dr. F. Trybom (Sweden) to consider the salmon problems, of great concern to the nations bordering the Baltic and a number of reports were presented in the following years. Based on the material compiled estimates were made of the present level of the salmon fishery in the Baltic, and information provided on hatcheries and liberation of salmon and sea trout in Baltic rivers and on the national measures taken to protect the salmon stocks. Because of the decreasing yield of the salmon fishery suggestions were made for international agreements on propagation and protection of the stocks.

In 1912 a special section of representatives from the Baltic countries was formed to consider the main problem, the reason for the decline of the stocks in the Baltic rivers and the possibilities of an improvement in the situation. For this purpose 5 rivers situated in Russia, Sweden, Denmark, Finland and Germany respectively were chosen as subjects for observations and investigations. A report by dr. H. Henking (ICES, Rapp. 16, 1913) described the salmon fishery in the Baltic and the research rivers, but the First World War interrupted cooperative work. However in his second report (ICES, Rapp. 23, 1916), dr. Henking announced progress in research as some of the countries had reported on catch statistics, tagging of adult salmon and natural and hatchery - reared smolts, scale analysis and other special studies.

After the war the Baltic salmon and sea trout were dealt with in the Limnological Committee of ICES which promoted the publication of two papers by dr. Henking: Untersuchungen an Salmoniden I and II (ICES, Rapp. 61, 1929 and Rapp. 73, 1931), which dealt with racial studies of salmon and sea trout.

At the meeting of the International Council in May 1927 it was resolved that, before the next annual meeting, a meeting of the Transition Area Committee and the Baltic Area Committee should take place in order to discuss the scientific basis for practical measures to be taken regarding i.e. the salmon. At this meeting several special papers concerning the proposals for protection of the salmon and sea trout in the Baltic were presented and it was agreed to recommend an international size-limit for salmon and sea trout in the Baltic (ICES Rapp. 48, 1928).

At the ICES meeting in 1931 the name of the Limnological Committee was changed to the Salmon and Trout Committee. The following year a meeting of experts, to consider the methods of investigations employed for salmon and trout was recommended and, in 1933, a Sub-Committee was appointed to draft the programme for this meeting. This took place in the same year and made the following recommendations (ICES Rapp. 91, 1934):

- 1) That the questions concerning the protection and improvement of salmon in the Baltic should be treated in the Baltic Committee.
- 2) That the scales for age determination of salmon and sea trout can be taken from different parts of the body of the fish but, for determination of the calculated rate of growth, scales taken immediately above the lateral line and below the dorsal fin were recommended.
- 3) That the general method of measuring of the length of salmonoid fish should be from the tip of the snout to the end of the central ray of the caudal fin.

- 4) That in every scientific publication involving statistics the method of dealing with statistical matters should be clearly indicated.
- 5) That in expressing the results of scale reading, the years in the river and the years in the sea should be expressed with a decimal point between the figures; the spawning mark should be expressed by the letter "G"; Part of a year should be expressed by a cross "+", and a whole year by the number "1".
- 6) That in publishing the results of scale reading the amount of erosion should be expressed according to a scheme used in Scottish investigations and expressed by the Latin letter "E" and a number.
- 7) That photographs of typical sea trout and salmon scales should be collected with a view to the publication of a short treatise by the International Council to serve as a guide to workers on the subject.
- 8) That for expressing the value of the coefficient of condition "K", separate formulae should be used for Salmon and Sea Trout.
- The formula for salmon should be:
$$K = \frac{100 W}{L^3}$$
- The formula for sea trout should be:
$$K = \frac{W 84.3}{L^3}$$
- The weight (W) should be expressed in grammes; the length (L) in centimetres.
- 9) That it is advisable to issue from time to time additional editions of the "Guide to Fishmarks" in order to include the most recent types of marks.
- 10) That the questions of the practical and economic value of

artificial propagation of salmon and sea trout in place of natural methods is of great importance; accordingly, experiments on a comprehensive scale should be conducted, the results of which would be applicable and accepted generally.

Subsequent to the establishment of the Salmon and Trout Committee more detailed information on the work on Baltic salmon carried out by the different countries were published in the annual Administrative Reports of ICES. In the following years many papers on Baltic salmon problems were published by ICES in the Rapports et Proces-Verbaux des Reunions; the papers mentioned below are of general interest.

G. Alm: Salmon in the Baltic precincts (ICES Rapp. 92, 1934).

T.H. Järvi and W.J.M. Menzies: The interpretation of zones on scales of salmon, sea trout and brown trout (ICES Rapp. 97, 1936).

T.H. Järvi: Fluctuations in the Baltic stock of salmon (ICES Rapp. 106, 1938).

T.H. Järvi: On the periodicity of salmon reproduction in the northern Baltic area and its causes (ICES Rapp. 119, 1948).

(The reader is further referred to the comprehensive list of publications in section 3 of this report).

The Second World War imposed a break in the salmon work. When the activities of the Salmon and Trout Committee were resumed at the meeting of ICES in 1945, the interest in Baltic salmon increased because of:

- 1) The immense peak in the Baltic salmon stock and in the coast and river catches, which unexpectedly occurred in the mid-forties.

- 2) The menace to the natural propagation of Baltic salmon by the hydro-power projects developed in Finnish and Swedish salmon rivers.

As far as Sweden was concerned this led to the constitution of a "Migratory Fish Committee" (later "The Salmon Research Institute"). At the ICES meeting in 1946 a cooperation between this body and the Salmon and Trout Committee was proposed (ICES Rapp. 117, 1947).

The growing interest in salmon in general and especially in the Baltic stock, as manifested by the increasing activities of the Salmon and Trout Committee, resulted in a resolution at the ICES meeting in 1957 that a symposium should be arranged in connection with the next meeting of ICES and that the subject matters to be discussed should be:

- (i) the effectiveness of liberating fry, parr or smolts of salmon and sea trout under different conditions, and
- (ii) tags for salmon and trout and their relative effectiveness

At this symposium twenty papers were read on tagging methods, smoltification, liberation, population dynamics and salmon conservation. A number of recommendations were proposed, including one that a working group to consider Baltic salmon problems should be established. This was approved by the Salmon and Trout Committee and the Council (ICES Rapp. 146 and 148, 1959). Further details about the establishment and the activities of the Working Group on Baltic Salmon are given on p....

At the ICES meeting in 1953 Dr. G. Alm, Sweden communicated a paper to the Baltic Sub-Committee on the subject of the necessity to impose restrictions on capture of salmon in that region. The suggestions, comprising closed season, minimum size for salmon and minimum mesh and hook size were approved by the Sub-Committee and adopted by the Consultative Committee. In accordance with a resolution of the Council the proposals were sub-

mitted to the Governments of Denmark, Sweden, Finland and Germany.

After negotiations in 1953, 1954 and 1957 between the Governments above an international agreement was drafted in 1962. The agreement "The Baltic Salmon Fisheries Convention of 1962" was ratified by Denmark, F.R. Germany and Sweden in 1963 and came into force in 1966. The articles of the Convention are stated as an appendix, p. As an official version in English of the Convention does not exist the most important articles should briefly be emphasized:

Article 1. Convention area includes the Baltic Sea, the Gulf of Bothnia and Gulf of Finland, limited by a line from Falsterbo (the southwestern point of Sweden) to southern Seeland, the southern Danish islands and Sønderborg (Jutland).

" 5. Minimum mesh size of salmon drift nets of natural and synthetic fibers: 170 and 160 mm respectively.

Minimum gap (shortest distance between point and shaft) of salmon hooks: 19 mm.

" 6. Minimum length of salmon: 60 cm.

" 10. The establishment of a permanent commission in which each Contracting Party is represented. The duty of this Commission is to establish contacts with scientists and research institutes in order to promote conservation and rational exploitation of the stock of Baltic salmon and to consider the expediency of changes in and additions to the convention.

At the request of this Commission several investigations and experiments with drift nets and long lines were carried out. Papers on the results were submitted to the Commission at meetings in 1968, 1969 and 1970.

In 1969 the Permanent Commission agreed on a recommendation about closed seasons and the prohibition of pelagic trawling for salmon fishing. The Contracting Parties adopted these additions to the convention, but on account of formal problems they were not ratified when the editing of this report was completed.

In 1971 Poland also joined the Convention. Already in 1964 Finland enacted regulatory rules similar to the articles of the Convention.

As the exploitation of Baltic salmon by USSR exclusively takes place in rivers, river mouths and surrounding coastal areas, no special legislation is elaborated by this nation for the offshore salmon fishery in the Baltic apart from a general minimum size of 60 cm for salmon.

Salmon problems were considered at "The Baltic Sea Conference 1972" in Stockholm arranged by "The Swedish Federation of Fisheries' Associations" attended by delegates from all the countries bordering the Baltic. In a resolution from the Conference it was stressed that strict protective measures were urgently required if the natural resource represented by salmon was not to be lost. Each state should therefore restore or by stocking compensate for their former smolt production, establish new spawning areas by construction of fish ways, investigate the effect of different fishing methods, follow the fishery statistically and not allow too intensive fishing. As the most urgent step however the Conference agreed that all states should ratify the Baltic Salmon Fisheries Convention, and in addition proposed closed seasons and provisions regarding details of gear mounting and maximum amount of gear per fishing vessel.

1.2. Formation and activities of the Working Group on Baltic Salmon

At the Symposium on Salmon and Sea Trout held at Charlottenlund in 1958 in connection with the annual meeting of the ICES, proposals were made about the establishment of a standing committee on Baltic salmon problems in order to promote cooperation in research and management of the salmon stock confined to the Baltic area.

The proposal was adopted as one of the recommendations of the symposium and approved by the Salmon and Trout Committee and the Council, reading as follows:

(f) That the Salmon and Trout Committee should establish a working group to consider the problems of salmon and sea trout in the Baltic.

(g) That the working party on salmon in the Baltic meet, if possible, in Sweden in March 1959 to further their consultations.

Following members of the Committee were nominated:

Denmark: Mag. K. Larsen, Mag. J. Knudsen
Finland: Prof. E. Halme
Germany: Prof. R. Kändler, Dr. F. Thurov
Poland: Prof. S. Zarnecki, Prof. F. Chrzan
Sweden: Dr. B. Carlin (chairman), Dr. A. Lindroth
USSR: Prof. N.J. Koshin, Dr. N.M. Lishev

In 1964 the member list was revised as appears from the recommendation from the Salmon and Trout Committee quoted in the section on the activities of the Working Group.

According to a further revision in 1972 the members of the Group should consist of the following persons:

Denmark: Mag. O. Christensen
Finland: Fil.lic. J. Toivonen

F.R.Germany: Prof. F. Thurow (chairman), Prof. H. Mann
 Poland: Prof. F. Chrzan, Dr. Chelkowski, Dr. R. Sych
 Sweden: Fil.lic. N. Johansson
 USSR: Dr. B. Evtjukhova

The same year Mag. O. Christensen was elected as Shairman and Fil.lic. N. Johansson as secretary.

The following survey of recommendations and excursions gives an idea of the activities of the Working Group.

1) Recommendations submitted to and adopted by the Salmon and Trout Committee. Quoted from Proces Verbal de la Réunion, i.e. according to the wording given by the Committee and the Council when approved.

1959

1. The Salmon and Trout Committee recommends that the work of the Baltic Group should be continued in order to discuss sampling methods and treatment of data and to exchange information on the progress of investigations. The next meeting of the Baltic working group will be held in Copenhagen on 15.-20. March, 1960.

2. The following recommendations submitted by the Baltic working group were adopted by the Committee: -

(a) A survey of Baltic salmon rivers ought to be made to contain data on original and recent production capacity of natural smolts of salmon and sea trout, and recent and planned production of smolts by means of liberations of reared parr or smolts.

(b) Tagging operations are highly desirable, especially of

(i) smolts, both natulal (wherever possible) and reared in Sweden and especially in Finland, USSR, and Poland,

(ii) kelts whenever such are liberated after stripping,

- (iii) clean fish in the sea, especially by such countries as Western Germany and Denmark, who, for obvious reasons, cannot take part in the tagging of smolts.
- (c) Studies on the river life and post-smolt period are important, especially,
 - (i) size and growth-rate of parr and their variability,
 - (ii) size and age of smolts, their variability and its causes (environmental conditions),
 - (iii) mortality and its causes,
 - (iv) food organisms and feeding conditions.
- (d) Investigations into predation on post-smolt and adult stages of salmon and sea trout.
- (e) Sampling data on size, age-classes, growth, condition factors, sex ratio, fecundity, sexual stages and food, from unselected commercial catches, data on catch effort and catch per unit effort.
- (f) Wherever large catches or landings of salmon are made the opportunity should be used to determine the relation between catch of different sea age-classes and recovering of tagged fish made within these lots in order to make smolt number estimates possible.

1960

It was recommended that the important investigations on commercial catches of Baltic salmon reported on by Danish and German representatives be continued, and, if possible, extended to permit estimations of abundance of year-classes and other basic data for the study of population dynamics and biology of the Baltic salmon, necessary for the management of the stock on an international basis.

1961

After the Scale-reading Symposium the Committee decided, upon recommendation of the Baltic Working Group, to consider a standardisation

- (i) of scale-sampling for back-calculation purposes as to position of sample on the fish, and
- (ii) of back-calculation methods for salmon and sea trout.

As the Group found it desirable to meet in Poland to study i.e., the salmon and sea trout in the River Vistula, the Committee was asked to make the necessary arrangements for that meeting.

1962

It was decided to support the following recommendations of the Baltic Working Group:-

- (i) that the Working Group should continue, especially to study the population dynamics of the Baltic stocks of salmon and sea trout.
- (ii) that the next meeting of the Baltic Working Group should be held in 1963. Dr. Lishev promised to examine the possibilities of arranging the meeting in the USSR., together with an excursion to study salmon conservation in the field. The main subject of discussion at this meeting would be population dynamics. Dr. Lishev and Dr. Thurow promised to give a survey of their work on this subject.

1963

That the countries exploiting the salmon stocks in the Baltic should be requested to give annually the following information on their fisheries:-

- (a) monthly catches, if possible divided into salmon and sea trout,
- (b) statistics on weight categories,
- (c) length and/or age composition data and
- (d) Catch per unit of effort data (e.g. catch per 100 nets and 1000 hooks, if possible including seasonal and regional variations).

1964

Recommendations submitted by the Working Group to the Salmon and Trout Committee: 1. That the member list should be revised. 2. That the Working Group should continue its work and the next meeting be held in Finland. 3. That an authoritative terminology of stages and types of salmon and sea trout is desirable - were adopted as quoted below:

1. That the Baltic Working Group should continue to function during the forthcoming year and that its members should consist of the following persons, NM K. Larsen and O. Christensen (Denmark); E. Halme and J. Toivonen (Finland); R. Kändler and F. Thurow (Germany); F. Chrzan and S. Zarnecki (Poland); B. Carlin and A. Lindroth (Sweden) and N.M. Lishev and N.I. Koshin (U.S.S.R.) and that the next meeting be held in northern Finland in the autumn of 1965.
2. That a questionnaire drafted by the Chairman should be sent to all members asking them to revise as far as possible the list of names for various stages in the life of salmon and sea trout etc., including natural and reared fish as published in earlier Council papers and to return the completed questionnaires to Mr. I.R.H. Allan of England, who had offered to act as Rapporteur for this purpose.

1965

1. That smolt taggings in the western Baltic, Riga Bay and the Bay of Finland and adult salmon taggings in the open Baltic should be carried out by member countries.
2. That experiments involving the transfer of salmon between rivers should be carried out by Baltic member countries to test out the feasibility of such transfers on a large scale.

1966

1. That in view of the interference in a variety of ways with rivers flowing into the Baltic and the adverse effects on salmon and sea trout stocks resulting therefrom, the member countries concerned should be asked to consider what steps should be taken to improve the position, including such matters as the control of pollution, facilitating the movement of ascending and descending fish and rearing of fish by artificial means.
 2. That, as it seems likely that there will be a need for keeping under review the stocks of salmon in the Baltic for several years to come, the Baltic Salmon Working Group should continue, it being understood that the first definitive report will be available for the next meeting of the Committee.
- 2) Recommendations within the Working Group.

1960 (March)

1. A bibliography on scale-reading is wanted. Dr. Lindroth undertook the compiling of a list of papers pertaining to the study of body/scale relationships.
2. If possible the group should send a member to the ICNAF meeting on scale-reading in Bergen in May this year and invite a representative from ICNAF to visit the scale symposium of ICES in Moscow in autumn.

3. The group is interested in an excursion to the Baltic salmon rivers in USSR in connection with the ICES meeting in Moscow. Dr. Bogdanov should convey this desire to the chairman of the Salmon and Trout Committee, Prof. Nikolsky.
4. The group should meet in Moscow in the autumn for a business sitting and again in Kiel next year for two to three days in the period 15 March to 15 April.

1960 (September)

1. That next meeting was to be held in Copenhagen the day before the Symposium on Reading of Salmon Scales in connexion with the 1961 meeting of the Council,
2. That the main subject for discussion should be salmon population dynamics in the Baltic.

1962 (July)

1. The member Countries should during 1963 supply, to the chairman or secretary
Data for survey of salmon rivers,
Bibliography on Baltic Salmon to the year 1962 inclusive,
List or diagram of organizations concerned with Baltic salmon
List of agreements concerning terminology and methods.
2. Remaining program recommendations made up to now should during 1963 be systematized and, as proposed now, the following new items are to be considered. Sea trout of the wide-migrating form is to be included in the work (Zarnecki).

Statistical data on sea catch should not refer to calendar year but to fishing season or both (Christensen).

Food of small salmon in the sea should be studied (Carlin).

Transplantations for experimental purposes should be studied (Zarnecki).

1962 (October)

- a) Since the importance of sea trout is increasing in Denmark, Germany and Poland, this fish should be given increased attention by the working group.
- b) The survey of Baltic salmon rivers should be widened to cover the trout streams (it was mentioned that the survey of Danish rivers now almost completed, will cover all rivers).
- c) A joint German-Danish project of releasing tagged salmon smolts in the western part of the Baltic is now under way and the first smolts will be released in 1964.

1963 (June)

- a) A progress report should be prepared along the lines discussed by this meeting. A subgroup (Carlin, Christensen, Thurow) shall discuss the section devoted to Baltic salmon population model.
- b) Sea catch in the Baltic proper should if possible be recorded as catch per month or half year.
- c) Next meeting is proposed to be held in Kiel in March 1964.

1966 (August)

Institutes, which report on foreign tags, should forward the tag to the country to which it belongs together with a map indicating the place of recapture.

1968 (October)

As "Sea life of Atlantic salmon" was accepted as main subject for the meeting in 1969 of the Anadromous and Catadromous Fish Committee, the Working Group decided to contribute with a relevant joint report on Baltic Salmon. In order to compile and discuss the material necessary for the report it was proposed to arrange a meeting in Hamburg or Kiel, February 1969.

1971 (September)

The proposal, that the Working Group should be continued at least until the Reference Report has been completed and the assessment of salmon in the Baltic is taken a further stage, was approved by the Committee.

- 3) Excursions in connection with sittings of the Working Group.

Sweden, March 1959

Excursions to the Hölle Salmon Laboratory of the Migratory Fish Committee (now Salmon Research Institute), to the Forsmo salmon rearing station of the State Power Board and Bergforsen's salmon rearing station of the Bergforsen's Hydroelectric Power Company.

Denmark, October 1959

Excursions 2-3 Oct. to the trout ponds at Højenkjær, at Vingsted and Spjarup to the fish harbour and trout processing plant in Esbjerg and to "The Danish Trout Pond Farmers Experimental Station at Brøns".

Denmark, March 1960

Excursions to the fishing harbour of Rønne in Bornholm.

Poland, July 1962

Excursions to the Sea Fisheries Institute in Gdynia, to the rivers Raba and Dunajec in south Poland, Lopuszna rearing station, Roźnów and Czchów power stations and Mydlniki Fisheries Research station.

USSR, June 1963

Excursions to Daugava and Gauja rivers, to Tome rearing station and Zvejniek collective fishery farm.

F.R. Germany, March 1964

Excursions to sea trout brooks and hatcheries and to the "Hydrobiologische Anstalt" in Plön and "Bundesforschungsanstalt für Fischerei" in Hamburg-Altona.

Finland, August 1966

Excursions to river Oulujoki with Montta rearing station,
Maalismaa at Iijoki, Ischaara power plant at Kemijoki,
and Muonio rearing station at Torneojoki.

SECTION 2 ORGANIZATIONS, PROJECTS
AND BIOLOGISTS CONCERNED
WITH BALTIC SALMON

2.1 Denmark. Organizations, Projects and Biologists concerned
with Baltic Salmon

2.1.1 Danmarks Fiskeri- og Havundersøgelser
(Danish Institute for Fisheries and Marine Research)
Charlottenlund Slot, 2920 Charlottenlund, Denmark

Population studies.

Catch and effort statistics.

Tagging experiments in order to check stocking efforts.

Gear experiments.

Cand. mag. Ole Christensen.

2.2 F.R. Germany. Organizations, Projects and Biologists concerned
with Baltic Salmon

2.2.1 Bundesforschungsanstalt für Fischerei,
Institut für Küsten- und Binnenfischerei
(BFA, KüBiFi) Labor. Kiel,
23 Kiel 14, Wischhofstrasse 1-3

Population dynamics, catch composition, distribution of
catch and effort in the Baltic.

Prof. Dr. Thurow

2.2.2 Bundesforschungsanstalt für Fischerei,
Institut für Küsten- und Binnenfischerei
2000 Hamburg 50, Palmaille 9

Mariculture, feeding experiments with post smolts in
cages in brackish water.

Dipl. Biol. H. Koops

2.2.3 Institut für Meereskunde
an der Universität Kiel,
Labor Seefischmarkt
23 Kiel 14, Wischhofstrasse 1-3

Mariculture, the use of brackish water warmed by a power
plant for pen-rearing and feeding of salmonids.

Dipl. Biol. H. Grave

2.3 Finland. Organizations, Projects and Biologists concerned
with Baltic Salmon

2.3.1 Finnish Game and Fisheries Research Institute,
Fisheries Division
Pitkäsillanranta 1
00530 Helsinki 53

1.1 Population studies and tagging experiments on salmon.
Fil.lic. Jorma Toivonen

1.2 Studies on salmon blood and food experiments on hatchery-
reared salmon.
Fil.lic. Kai Westman

1.3 Hatchery-rearing experiments on salmon.
Fil.lic. Olli Sumari
Laukaan keskuskalanviljelylaitos 41360 Valkola

2.3.2 Fisheries Foundation
Liisankatu 12 E
00170 Helsinki 17

2.1 Rearing experiments on salmon in natural ponds.
Director Tapani Sormunen

2.3.3 Husö Biological Station
Pålsböle
66220 Bergö, Åland

3.1 Population studies and tagging experiments on salmon.
Fil.mag. Karl Stora

3.2 Salmon rearing experiments in brackish water.

Fil.lic. Karl Storå

2.3.4 Parasitological Institute of the Finnish
Scientific Society

Porthaninkatu 3

20500 Turku 50

4.1 Parasite studies on salmon.

Fil.lic. Göran Bylund

2.4 Poland. Organizations and Biologists concerned with
Baltic Salmon and Trout

2.4.1 Sea Fisheries Institute

Al. Zjednoczenia 1
81-345 Gdynia

1.1 Salmon and sea trout: age and growth, composition of
catches, tagging experiments.
Prof. Feliks Chrzan

2.4.2 Inland Fisheries Institute

Zabieniec
05-500 Piaseczno near Warsaw

2.1 Sea trout: scale reading, composition of catches,
construction of models for fishery-biological and
commercial purposes.
Dr. Roman Sych

2.2 Salmon, sea trout and rainbow trout: breeding and
rearing experiments, tagging experiments in order to
study the migrations and effects of stocking.

Dr. Ryszard Bartel
ul. Bytowska 5, 80-328 Gdańsk-Oliwa

2.4.3 Polish Academy of Sciences

ul. Slawkowska 17
31-016 Cracow

3.1 Sea trout: composition of fish populations and artificial
propagation in the Upper Vistula tributaries.

Dr. Wladyslaw Kolder

3.2 Lake trout: methods and effects of introductions into dam reservoirs.

Dr. Zbigniew Wajdowicz

2.4.4 Academy of Agriculture in Cracow,
Experimental Station of Fisheries
32-081 Mydlniki near Cracow

4.1 Salmon, sea trout, lake trout and brown trout: studies on growth, ripening and behaviour of several successive generations bred in ponds and crossed; tagging experiments in order to study migrations.

Dr. Stanisława Skrochowska

2.4.5 Academy of Agriculture in Szczecin

5.1 Salmon and sea trout: structure of populations in West Pomeranian rivers and tagging experiments mainly in order to study the migrations.

Dr. Zygmunt Chelkowski, M. Sc. Bożena Chelkowska
ul. Broniewskiego 1 Bl. 30, 71-460 Szczecin

5.2 Salmon and sea trout: biochemical components of blood serum.

Dr. Cecylia Felińska
ul. Królewicza Kazimierza 4, 71-552 Szczecin

5.3 Salmon and sea trout: embryophysiology, and some physiological problems of ripening and spawning.

Dr. Aleksander Winnicki
ul. Królewicza Kazimierza 4, 71-552 Szczecin

2.4.6 Academy of Agriculture in Poznań

ul. Wojska Polskiego 71 c

60-625 Poznań

6.1 Salmon, sea trout and lake trout: age and growth of spawning population, number and structure of young fish population in the Warta River system.

Dr. Michal Iwaszkiewicz,

M. Sc. Jerzy Mastyński,

M. Sc. Antoni Przybyl

2.4.7 Academy of Agriculture in Olsztyn

10-725 Olsztyn-Kortowo

7.1 Lake trout: structure of spawning population and fluctuations of fish number in Wdzydze Lake.

Dr. Jan A. Szczerbowski

2.4.8 Polish Angling Association

ul. Dzierżyńskiego 18

30-048 Cracow

8.1 Sea trout of Upper Vistula: studies on migration and effects of stocking by means of tagging.

M. Sc. Waclaw Palka

2.5 Sweden. Organizations, Projects and Biologists concerned
with Baltic Salmon

2.5.1 The National Board of Fisheries

Otterhällegatan 12, Fack
S-413 10 Gothenburg 2

Central administration.
Superintendent Dr. J. Hult.

Laboratories:
Institute of Freshwater Research, Drottningholm.
Prof. G. Svärdson.

Institute of Marine Fish. Research, Lysekil.
Dr. A. Lindqvist.

2.5.2 Swedish Salmon Research Institute

S-810 70 Älvkarleby 1

2.1 Tagging experiments in order to study the migration of
salmon; the population structure and dynamics in the
Baltic; the effect of the Swedish salmon conservation
programme and the effects of breeding experiments.

Fil.lic. N. Johansson
Fil.kand. P.O. Larsson

2.2 Selective breeding experiments.

Prof. A. Nygren
Lantbrukshögskolan, S-755 90 Uppsala

2.3 Seasonal and developmental variations in the mineral
regulation capacity and the haemoglobin polymorphism
of salmon.

Prof. H.J. Koch, Zoological Institute
B-3000 Leuven, Belgium

2.4 Physiological investigations of hatchery-reared salmon.

Fil.lic. C. Wendt

2.5 Food experiments on hatchery-reared salmon.

Fil.mag. Eva Bergström

2.6 The effects of PCBs on salmon.

Fil.lic. Nils Johansson

2.7 Studies of gill hyperplasia in hatchery-reared salmon.

Fil.lic. Nils Johansson

2.5.3 State Power Board

Fack, S-162 87 Vällingby 1

Construction and operation of fish outline facilities.
Salmon rearing technique. Seven salmon rearing stations.
Fil.lic. E. Montén

2.5.4 Water-Power Companies

Salmon rearing at eight stations.

2.5.5 University of Umeå, Biological Institute,

Section of Ecological Zoology

S-901 87 Umeå

5.1 The Baltic salmon, its natural and artificial regulation.

Prof. A. Lindroth

5.2 Sensory mechanisms in fish orientation.

Dr. G. Bertmar

5.3 The ecology of salmon post smolts in the Baltic.

Dr. L. Österdahl

2.5.6 Swedish Museum of Natural History

Stockholm

Chlorinated hydrocarbons, mercury and heavy metals in
herring, cod, flounder and salmon in the Baltic.

Prof. A. Johnels

2.6 USSR. Organizations, Projects and Biologists concerned
with Baltic Salmon

2.6.1 Balt NIIRH

Baltiysky nauchno - issledovatel'skiy institut rybnogo
khoziaistva. (Baltic Fisheries Research Institute)
Riga - 49, 6 Daugavgrivas Str.

Fundamental studies of natural and artificial reproduction
of Baltic salmon, the improvement of the technique of
breeding and artificial foods, physiological and bio-
chemical investigations, estimation of rate of recapture,
rational use of fishery stocks and catch forecasting.

Lishev, M.N. - Dr. of Biol., Deputy Director.
Malikova, E.M. - Dr. Habil. of Biol., Head of the Laboratory.
Mitans, A.R. - Senior Scientific Worker.
Kotova, N.I. - Senior Engineer.
Peslaks, Ja.K. - Scientific Worker
Glagoleva, T.P. - Scientific Worker.

2.6.2 Gos NIORH

Gosudarstvenny nauchno. - issledovatel'skiy institut ozernogo
i rechnogo rybnogo khoziaistva (State Research Institute
of Lake and River Fisheries)
Leningrad V - 53, 26 Makarov Embankment

Artificial reproduction of Baltic and lake salmon, egg
incubation and breeding technique improvement, physio-
logy and parasitology of juveniles, rate recapture in-
vestigations.

Petrenko, L.A. - Dr. of Biol., Deputy Director of Gos NIORH.
Jandovskaya, N.I. - Dr. of Biol., Senior Scientific Worker.
Melnikova, M.N. - Dr. of Biol., Senior Scientific Worker.

Popov, L.N. - Dr. of Biol., Senior Scientific Worker.
Bogdanova, E.A. - Dr. of Biol., Senior Scientific Worker.
Shimanovskaya, L.N. - Head of the Laboratory.
Kazakov, R.V. - Dr. of Biol., Scientific Worker
Leizerovitch, H.A. - Scientific Worker.
Maerkovitch, I.V. - Scientific Worker.

2.6.3 ZIN AN SSSR

Zoologichesky institut Akademii nauk SSSR
(Zoological Institute of the Academy of Sciences of USSR)
Leningrad V - 164, 1 University Embankment

Biology of Baltic and lake salmon.

Khalturin, D.K. - Dr. of Biol., Senior Scientific Worker.

2.6.4 LGU

Leningradsky gosudarstvenny universitet
(University of Leningrad)
7/9 University Embankment

Salmon breeding and ichthyology, biological and physiological investigations of juveniles.

Vernidub, M.F. - Dr. of Biol., Assistant Professor.
Gorodilov, U.N. - Senior Scientific Worker.
Khalturina, M.I. - Scientific Worker.

2.6.5 Petergofsky biologichesky institut LGU

(Peterhof Biological Institute LGU)
Leningrad region, Old Petergof, 2, Oranienbaum Highway.

Salmon breeding and ecology.

Persov, G.M. - Dr. Habil. of Biol., Head of the Laboratory.
Sakun, O.F. - Dr. of Biol., Senior Scientific Worker.

Tsentralnaya laboratoriya po vosproizvodstvu rybnykh
zapasov Glavrybvoda. (Central Laboratory of Fish Stocks
Reproduction of Glavrybvod)
Leningrad - 22, 24/52 Prof. Popov Str.

Endocrinology and ecology of salmonids.

Baranikova, I.A. - Dr. Habil. of Biol., Director of the
Central Laboratory.
Krasnodembskaya, K.D. - Senior Scientific Worker.
Bajunova, N.N. - Scientific Worker.

2.6.6 Baltrybvod

Baltiyskoe basseynovoe upravlenie po ohrane i vosproizvodstvu
rybnykh zapasov i regulirovaniyu rybolovstva. (Baltic Basin
Management of Protection and Reproduction of Fish Stocks and
Fishery Control)
Riga, 14 Pils Str.

Artificial reproduction of Baltic salmon at fish-breeding
plants, protection of salmon and salmon rivers, fishery
control and ichthyological observations.

2.6.7 Sevzaprybvod

Severo-zapadnoe basseynovoe upravlenie po ohrane i vosproiz-
vodstvu rybnykh zapasov i regulirovaniyu rybolovstva.
(North-Western Basin Management of Protection and Reproduc-
tion of Fish Stocks and Fishery Control)
Leningrad, 63 Neva Avenue

Artificial reproduction of Baltic salmon at fish-breeding
plants, protection of salmon and salmon rivers, fishery
control and ichthyological observations.

SECTION 3 SURVEY OF BALTIC RIVERS

Survey of Baltic Salmon Rivers

Country: Denmark

No Danish stream flowing into the Baltic supports a salmon run, nor does any information exist on runs in former times. In 1972 stocking experiments with salmon was carried out from the island of Bornholm situated in the Baltic main basin. A number of 2000 salmon smolts were tagged and released in two small trout streams: Læså and Øleå.

Of the Danish water-courses draining into the Baltic Sea, 168 are, by nature, fit for sea trout spawning. Early in the century about 110 were used regularly by sea trout. In 1960 the number was reduced to 80 as a consequence of human activities, 20 running into the Baltic main basin (from Bornholm) and the remaining into the Western Baltic.

Survey of Baltic Salmon Rivers

Country: F.R. Germany

No German streams flowing into the Baltic Sea support salmon runs nor does any information exist on runs in former times. In the years 1966-73 stocking experiments were carried out in two small streams running into Kiel Bay and about 12,000 hatchery reared salmon smolts were added. None of these have been reported as ascending adult fish.

About 50 streams of F.R. Germany drain into the Western Baltic. At present 15 support a sea trout run.

Since 1965 a considerable decrease in the catches of sea trout has been noticed, probably a consequence of declining smolt production.

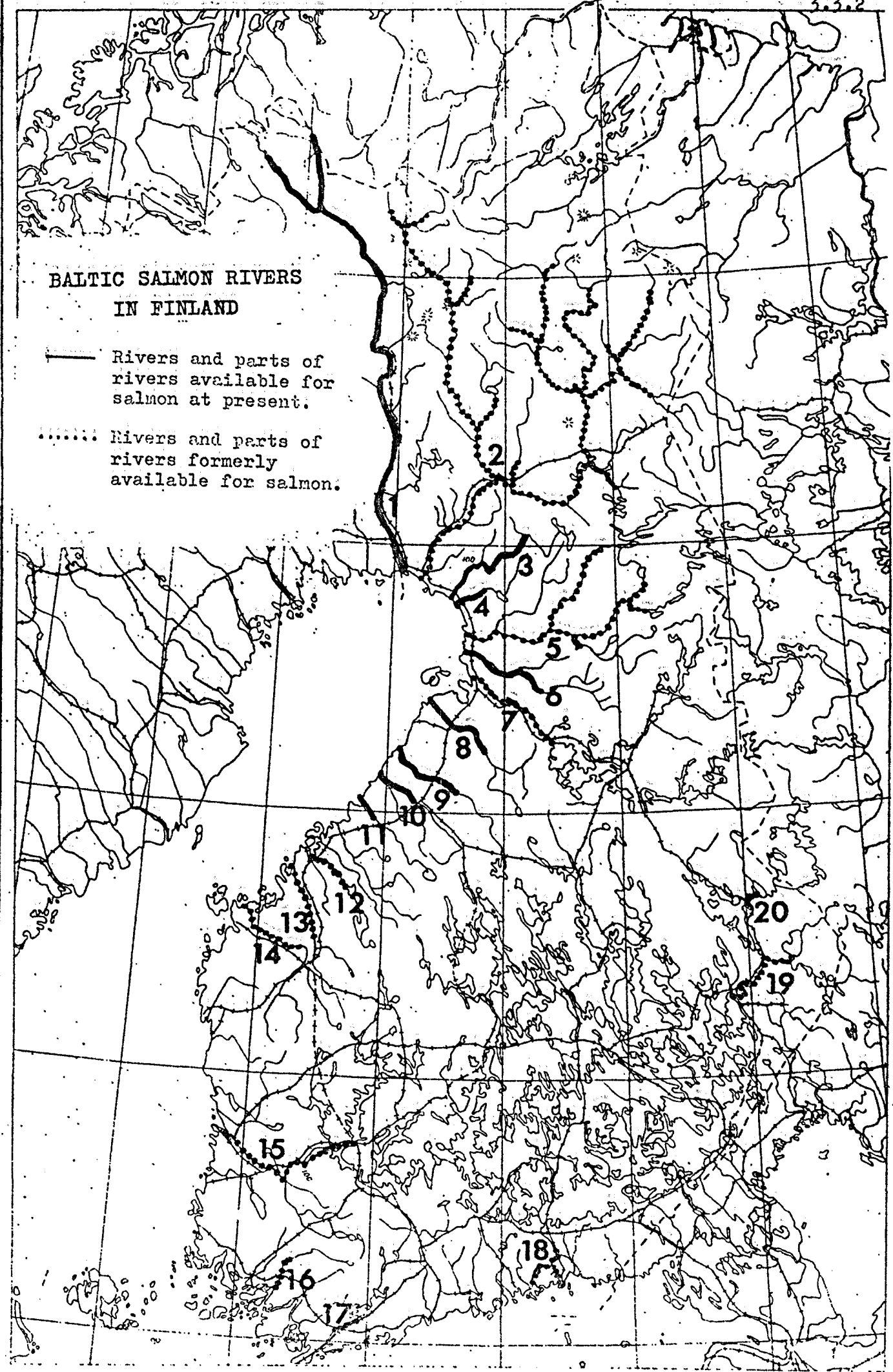
Survey of Baltic Salmon Rivers

Country: Finland

No.	River Name	Estimated smolt production	
		Original	Recent (1972) Natural Reared
1.	Tornionjoki	(1 000 000 total)	
		325 000 Finnish side	325 000 -
2.	Kemijoki	1 000 000	- 20 000
3.	Simojoki	55 000	45 000 -
4.	Kuivaniemenjoki	10 000	5 000 -
5.	Iijoki	320 000	- -
6.	Kiiminginjoki	40 000	30 000 -
7.	Oulunjoki	450 000	- 100 000
8.	Siikajoki	20 000	10 000 -
9.	Pyhäjoki	20 000	10 000 -
10.	Kalajoki	20 000	5 000 -
11.	Lestijoki	10 000	5 000 -
-			
15.	Kokemäenjoki	450 000	- -
-			
18.	Kymijoki	400 000	- -
Some small salmon rivers (salmon stock died out before 1900):			
12.	Ähtävänjoki,		
13.	Lapuanjoki,		
14.	Kyrönjoki,		
16.	Paimionjoki and		
17.	Mustionjoki		
	all together	70 000	- -
	total	3 190 000	435 000 120 000
			<u>435 000</u>
			555 000
<u>Landlocked salmon:</u>			
19.	Pielisjoki (Lake Saimaa)	100 000	- -
20.	Lieksanjoki (Lake Pielinen)	25 000	- -
	total	125 000	- -

BALTIC SALMON RIVERS IN FINLAND

- Rivers and parts of rivers available for salmon at present.
- Rivers and parts of rivers formerly available for salmon.



In former times sea trout existed in 47 Finnish rivers running into the Baltic. The total run of sea trout smolt at that time is estimated to 500.000.

Sea trout have now disappeared from 15 rivers and the total smolt production has decreased to 100.000.

Ref.: Hurme, S., 1966: Suomen Itämeren puoleiset loki - ja taimenjoet. - Erämies 20 (11):13-17. English summary: Salmon and trout rivers in Baltic side of Finland.

Survey of Baltic Salmon Rivers

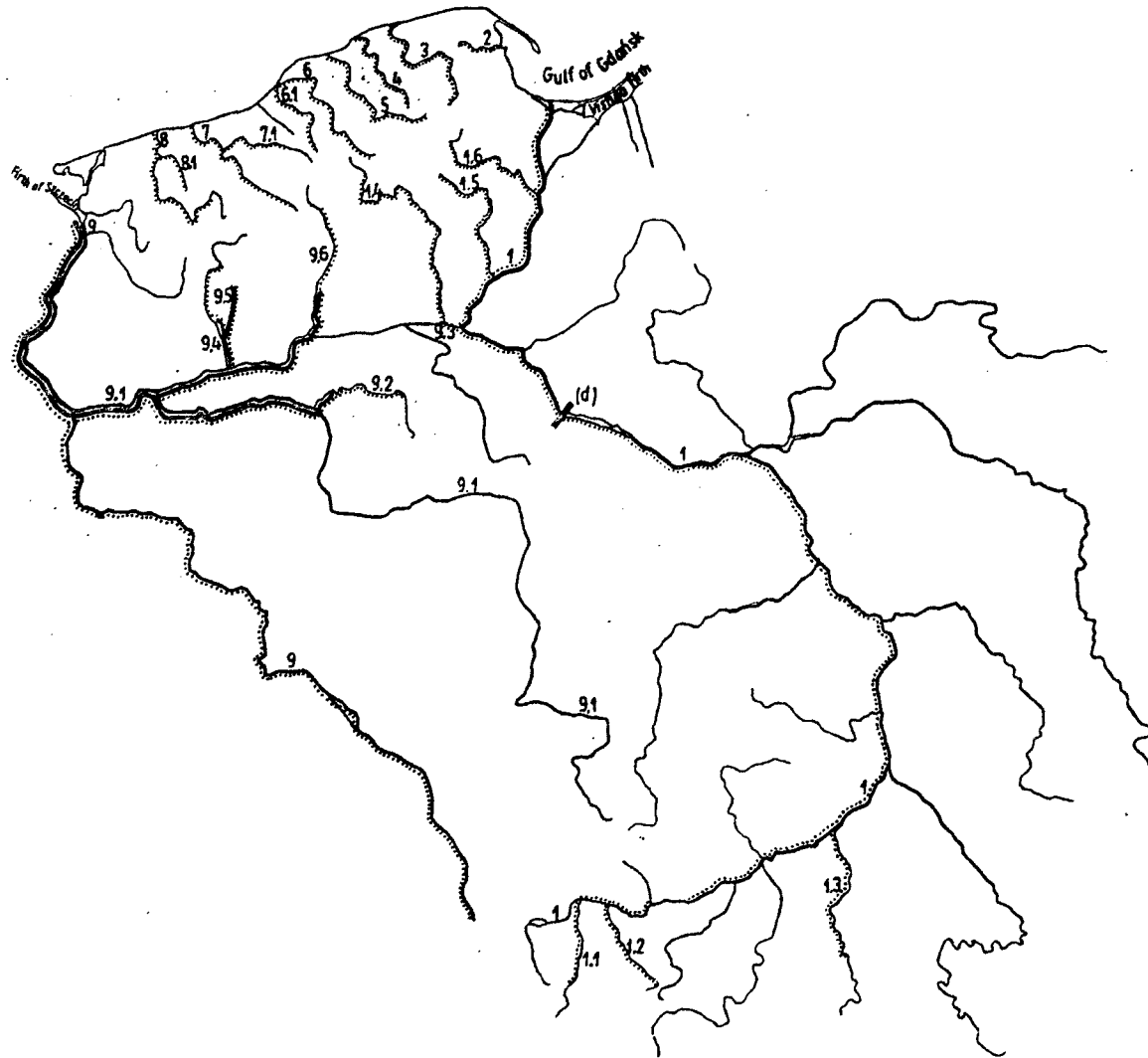
Country: Poland

River		Tributary		Run	
No.	Name	No.	Name	in former time	recently
1.	Vistula			+	-
		1.1	Sola	+	-
		1.2	Skawa	+	-
		1.3	Wisloka	+	-
		1.4	Brda	+	-
		1.5	Wda	+	-
		1.6	Wierzyca	+	-
2.	Reda			(+) never abundant, exceptional run recently	
3.	Leba			(+) "	"
4.	Lupawa			(+) "	"
5.	Slupia			(+) "	"
6.	Wieprza			(+) "	"
		6.1	Grabowa	(+) "	"
7.	Parseta			(+) "	"
		7.1	Radew	(+) "	"
8.	Rega			(+) "	stocking with fry
		8.1	Molstowa	(+) "	"
9.	Odra			+	+
		9.1	Warta	+	+
		9.2	Welna	+	+
		9.3	Noteć	+	+
		9.4	Drawa	+	+
		9.5	Plociczna	+	+
		9.6	Gwda	+	+

total production: 1 000 smolts which are mainly due to stocking

Salmon Rivers in Poland:

- recently, i.e. in 1972
- in former time, since 17th century
- (d) the dam built in 1968



Survey of Sea Trout Rivers^{x)}

Country: Poland

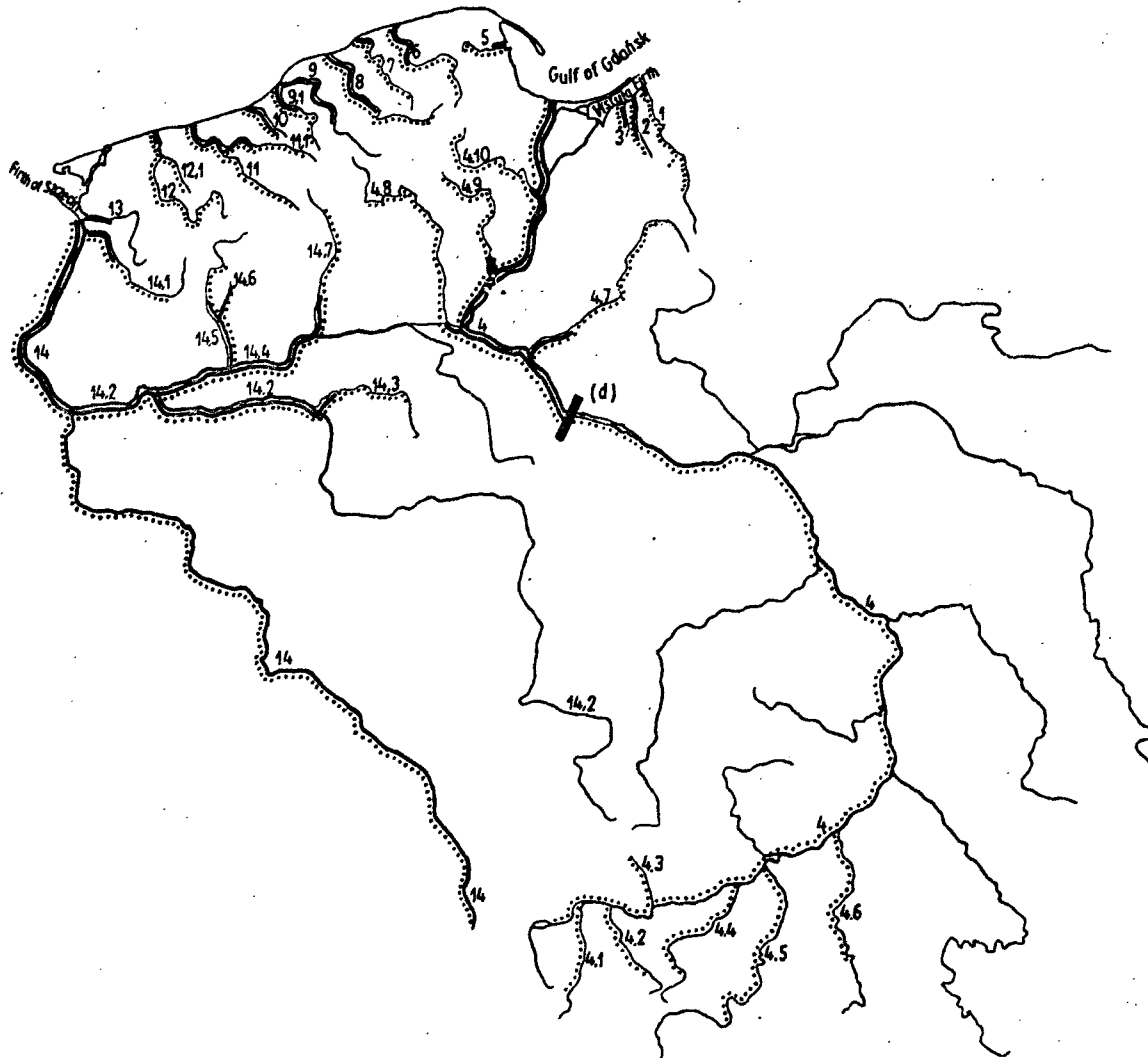
River		Tributary		Run	
No.	Name	No.	Name	in former time	recently
1.	Pasleka			+	+
2.	Bauda			+	+
3.	Narusa			+	+
4.	Vistula			+	+ in lower part
		4.1	Sola	+	-
		4.2	Skawa	+	-
		4.3	Rudawa	+ introduced stock	-
		4.4	Raba	+	-
		4.5	Dunajec	+	-
		4.6	Wisloka	+	-
		4.7	Drweca	+	+
		4.8	Brda	+	-
		4.9	Wda	+	-
		4.10	Wierzyca	+	-
5.	Reda			+	+
6.	Leba			+	+
7.	Lupawa			+	+
8.	Slupia			+	+
9.	Wieprza			+	+
		9.1	Grabowa	+	+
10.	Uniesta			+	+
11.	Parseta			+	+
		11.1	Radew	+	+
12.	Rega			+	+
		12.1	Molstowa	+	-
13.	Gowienica			-	+ introduced stock
14.	Odra			+	+
		14.1	Ina	+	+
		14.2	Warta	+	+
		14.3	Welna	+	+
		14.4	Noteć	+	+
		14.5	Drawa	+	+
		14.6	Plociczna	+	+
		14.7	Gwda	+	+

total production: 300 000 smolts mainly as a result of stocking

x) only the wide migrating stocks have been included

Sea Trout Rivers in Poland
(including only the wide migrating stocks):

- recently, i.e. in 1972
- in former time, since 17th century
- (d) the dam built in 1968



Survey of Baltic Salmon Rivers

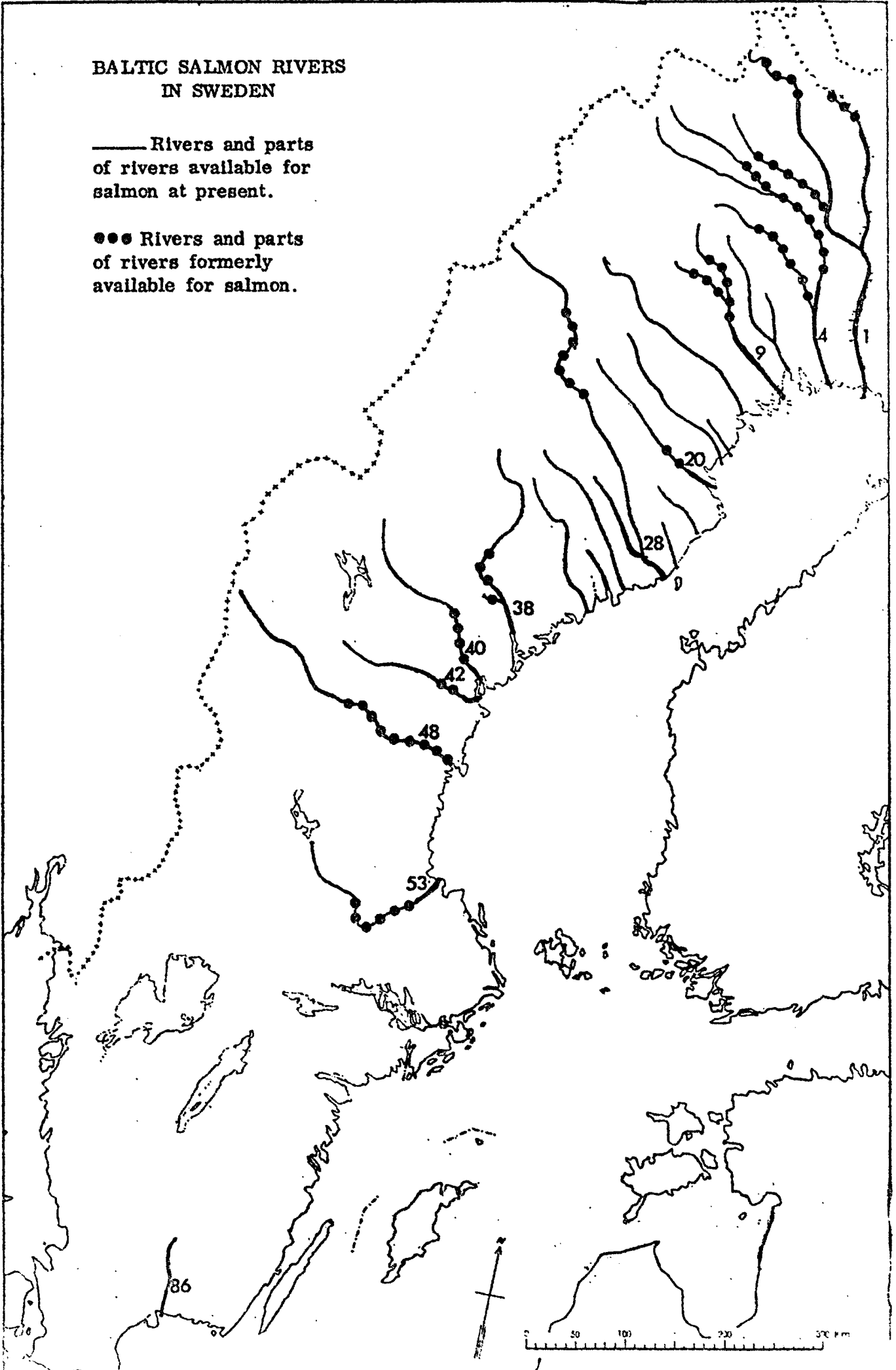
Country: Sweden

No.	River Name	Estimated smolt production		
		Original	Recent	
			Natural	Reared
1.	Torne älv	(1 000 000 total)		
		675 000 Swedish side	675 000	-
4.	Kalix älv	250 000	250 000	-
9.	Lule älv	540 000	-	540 000
20.	Skellefte älv	110 000	-	110 000
28.	Ume älv	350 000	250 000	100 000
38.	Ångermanälven	300 000	-	300 000
40.	Indalsälven	320 000	-	320 000
42.	Ljungan	300 000	100 000	25 000
48.	Ljusnan	400 000	100 000	200 000
53.	Dalälven	350 000	50 000	70 000
86.	Mörrumsån	400 000	125 000	-
total		3 995 000	1 550 000	1665 000
				<u>1550 000</u>
				3215 000

BALTIC SALMON RIVERS IN SWEDEN

—— Rivers and parts
of rivers available for
salmon at present.

●●● Rivers and parts
of rivers formerly
available for salmon.



Survey of Baltic Salmon Rivers

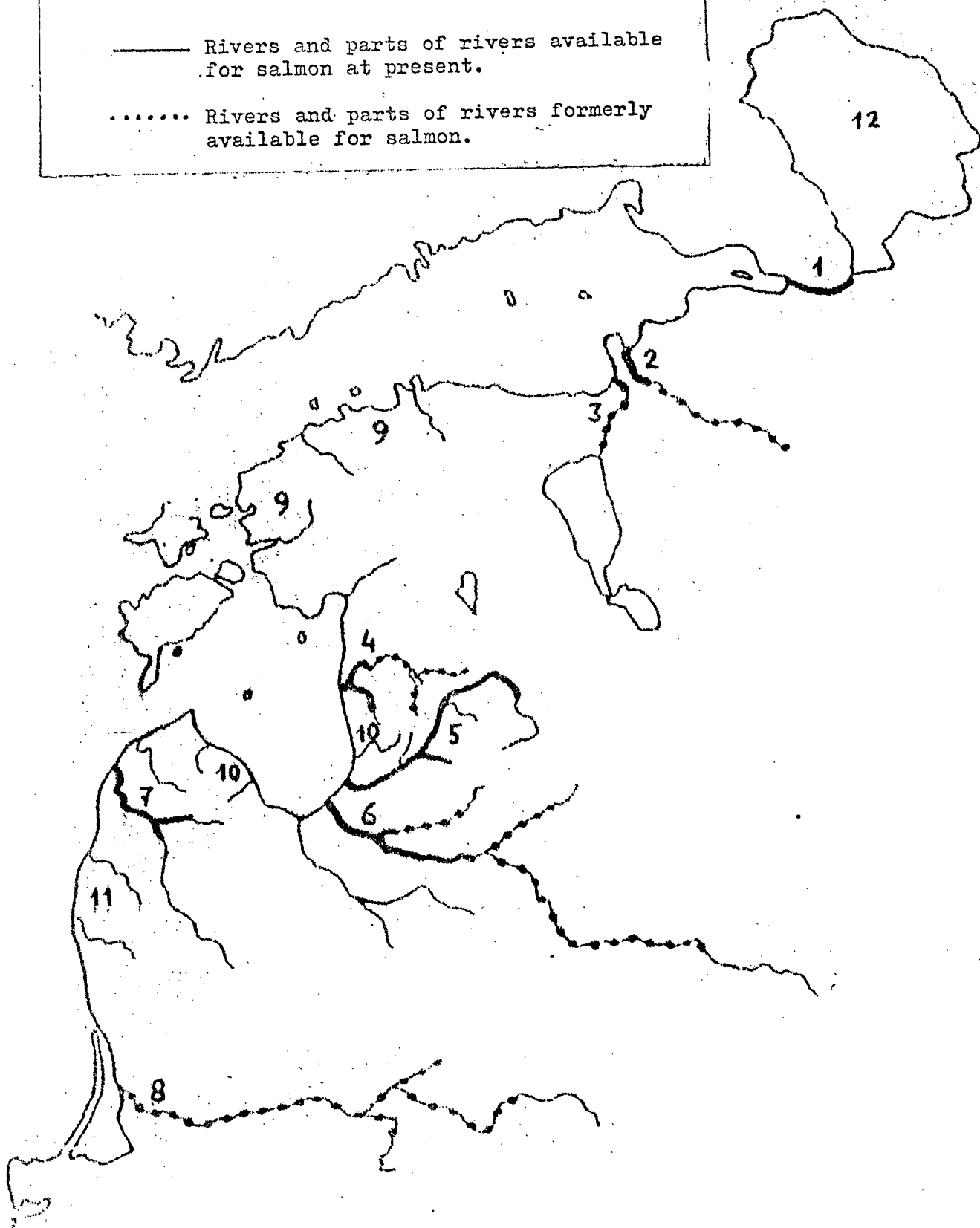
Country: USSR

No.	Riwer Name	Estimated smolt production		
		Original (1900) Natural	Recent (1970) Natural Reared (the number of relea- sed Salmon juveniles)	
1.	Neva	40 000	4 000	
2.	Luga	20 000	1 000	155 000
3.	Narva	20 000	1 000	two-summer old and two-year old
4.	Salatsa	100 000	20 000	
5.	Gauya	15 000	3 000	400 000 yerlings and
6.	Daugava	400 000	165 000	two-summer old
7.	Venta	5 000	3 000	20 000 two-year old
8.	Niemen	50 000	1 000	120 000 one summer old
9.	Small rivers of the Finnish Gulf	15 000	2 000	150 000 one summer old
10.	Small rivers of the Gulf of Riga	15 000	2 000	
11.	Some small rivers of the Baltic Coast	20 000	2 000	
total		700 000	204 000	575 000 yerlings, two-summer old and two-year old.
12.	The rivers of lake Ladoga (Lake Salmon)			

BALTIC SALMON RIVERS
IN USSR

—— Rivers and parts of rivers available
for salmon at present.

..... Rivers and parts of rivers formerly
available for salmon.



SECTION 4 CATCH STATISTICS

Catch statistics

Country: Denmark

Notes to the tables

Weight: gutted.

Sea trout (of the wide-migrating stocks) included.

Proportion of the catches 1,2 - 5,6 % during 1962-1972, annual mean 2,8 %.

For the years 1885-1909 sea trout of local origin also included.

Gear: Before 1946 mainly coastal fishery with fixed hooks and drift nets.

From 1946 to about 1955 mainly offshore fishery with long lines and drift nets.

Since 1955 exclusively offshore fishery with long lines and with increasing dominance of drift nets.

Fishing area: Baltic main basin.

Since the 50'ies a small part of the fishery took place in the Gulf of Bothnia (0 - 5,4 % during 1962-1972, annual mean 1,8 %).

Ref.: Fiskeriberetning for årene 1889-1971. Published by the Danish Ministry of Fisheries.

Monthly catches: Personal communication by the Danish Ministry of Fisheries.

Danish catches (in metric tons) of Baltic salmon

<u>Year</u>		<u>Year</u>		<u>Year</u>	
		1910	49	1940	47
		11	34	41	78
		12	33	42	127
		13	30	43	153
		14	30	44	142
1885	122	15	56	45	157
86	106	16	23	46	470
87	-	17	18	47	620
88	-	18	17	48	940
89	97	19	72	49	836
1890	73	1920	83	1950	1317
91	69	21	77	51	1096
92	103	22	42	52	1328
93	86	23	41	53	753
94	75	24	16	54	962
95	55	25	38	55	610
96	108	26	46	56	961
97	68	27	67	57	893
98	44	28	44	58	894
99	27	29	23	59	933
1900	29	1930	42	1960	1062
01	31	31	63	61	1387
02	17	32	158	62	1252
03	18	33	134	63	943
04	21	34	57	64	1434
05	23	35	65	65	1621
06	21	36	57	66	1302
07	25	37	27	67	1599
08	38	38	28	68	1699
09	37	39	35	69	1335
				1970	1190 +)
				71	950

+) In "Fiskeriberetning for året 1970" erroneously stated as 1224 tons.

Year	Months												Total		Grand total
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	I-VI	VII-XII	
1952	222.0	200.3	105.9	190.4	127.3	4.0	0.2	0.1	2.8	56.4	224.2	193.9	849.9	477.6	1327.5
1953	100.1	40.0	83.4	107.6	45.8	3.9	0.2	0.5	1.2	29.3	124.6	216.4	380.8	372.2	753.0
1954	116.6	64.9	47.4	82.0	45.7	11.9	0.5	1.3	24.8	105.6	240.7	219.6	368.5	592.5	961.0
1955	83.5	86.0	44.5	68.5	41.4	52.3	13.3	2.8	0.2	24.0	121.3	72.1	376.2	233.7	609.9
1956	69.1	21.7	3.5	92.9	174.9	47.8	1.6	1.3	23.4	124.7	212.1	188.3	409.9	551.4	961.3
1957	149.7	89.6	66.9	79.6	101.2	33.7	0.4	0.1	0.7	63.4	102.0	205.4	520.7	372.0	892.7
1958	97.3	37.2	66.4	79.4	85.2	23.4	0.2	0.1	0.2	73.6	132.4	298.8	388.9	505.3	894.2
1059	210.3	128.4	96.1	82.9	68.5	15.6	0.2	0.1	1.2	95.2	120.5	114.2	601.8	331.4	933.2
1960 ⁺)	126.2	85.0	92.5	75.2	24.2	9.7	0.4	0.2	82.7	116.4	154.1	329.6	412.8	683.4	1096.2
1961	155.0	179.1	139.5	61.9	20.3	1.8	0	3.8	58.6	155.3	290.2	320.5	557.6	828.4	1386.0
1962	267.4	73.1	133.0	84.9	68.2	26.5	0.8	0.7	49.6	75.4	229.2	243.4	653.1	599.1	1252.2
1963	105.5	59.8	110.5	97.8	74.8	5.4	0.9	1.1	14.0	130.4	196.0	146.9	453.8	489.3	943.1
1964	230.2	131.9	78.6	86.0	23.8	23.8	0.2	52.3	170.5	219.1	169.0	247.6	574.3	858.7	1433.0
1965	226.6	132.1	154.0	122.6	82.5	37.1	1.0	95.5	205.9	188.7	162.4	213.4	754.9	866.9	1621.8
1966	174.5	114.0	132.1	28.3	52.3	47.1	0.9	50.6	175.5	185.2	201.8	220.0	548.3	834.0	1382.3
1967	103.6	101.1	97.8	79.7	78.8	140.3	0.5	75.2	253.7	178.6	254.2	234.5	601.3	996.7	1598.0
1968	170.0	193.2	80.6	92.4	103.8	38.1	1.5	43.8	95.2	387.3	254.2	233.7	683.1	1015.7	1698.8
1969	164.4	94.2	85.5	47.4	30.6	28.0	2.1	1.3	187.3	336.7	157.0	200.5	450.1	884.9	1335.0
1970	210.9	109.4	91.4	35.0	21.9	29.3	0.2	4.5	192.1	298.5	85.8	111.1	497.9	692.2	1190.1
1971	102.1	46.7	23.0	27.5	45.3	18.1	0.4	13.5	176.4	226.4	101.2	168.1	262.7	686.0	948.7

⁺) Preliminary data without possibilities for correction. According to "Fiskeriberetning for året 1960" the total catch was in fact 1062 tons.

Danish catch per unit effort of salmon in the Baltic Sea
(weighted seasonal mean).

<u>Season</u>	Number of salmon caught	
	<u>per 100 nets</u>	<u>per 1000 hooks</u>
1957/58	-	17.2
58/59	-	20.4
59/60	-	11.3
1960/61	-	14.6
61/62	5.4	16.2
62/63	5.7	11.9
63/64	7.4	13.7
64/65	8.9	20.2
65/66	9.2	27.2
66/67	6.9	20.9
67/68	7.3	19.1
68/69	7.8	17.8
69/70	9.0	15.6
1970/71	6.0	11.1
71/72	7.9	22.4

An increase in the effort of salmon drift nets occurred during the seasons 1963/64-1967/68 as a consequence of the replacement of hemp nets by nets of synthetic fibres and reduction of the length of the strops connecting the net with the floating rope from 40-60 cm to 10-15 cm.

In the season 1969/70 the hook size was changed. Hooks with a gap of 15 mm formerly used were replaced by hooks with a gap of 19 mm according to the Convention. No statistically significant change of the effort of this gear is demonstrated however.

Catch statistics

Country: F.R. Germany

Notes to the tables

Weight: gutted.

Sea trout included. Proportion of the catches 4-16 % during 1957-1968, annual mean 7 %.

Gear: Since about 1870 fixed hooks up to 20 naut. miles offshore in autumn and winter, set net and beach seines in summer and autumn inshore, around 1900, at latest, drift nets in spring inshore.

Between 1900 and 1948 mainly fixed hooks and drift nets.

Since 1948 offshore fishery by long lines and drift nets with increasing dominance of drift nets.

Fishing area: Baltic main basin, between Arcona basin and Gotland basin (both included).

Between 1957 and 1968 0,3 of the total catches have been taken in the Bothnian Sea.

Since 1948 landings of the Federal Republic of Germany only; figures for the German Democratic Republic not available, but known to be insignificant.

Ref.: Thurow, F., 1966: Beiträge zur Biologie und Bestandskunde des Atlantischen Lachses in der Ostsee. Ber.dt. Wiss.Kommn. Meeresforsch. 18 (3/4).

German catches (in metric tons) of Baltic salmon and sea trout

<u>Year</u>		<u>Year</u>		<u>Year</u>	
		1920	68	1950	183
		21	43	51	136
		22	105	52	144
		23	93	53	75
		24	64	54	116
1895	243	25	68	55	157
96	254	26	151	56	286
97	344	27	202	57	344
98	250	28	343	58	194
99	175	29	189	59	243
1900	180	1930	146	1960	217
01	230	31	160	61	345
02	90	32	275	62	218
03	70	33	159	63	181
04	70	34	193	64	292
05	80	35	118	65	231
06	80	36	100	66	178
07	43	37	55	67	170
08	79	38	66	68	194
09	104	39	37	69	122
1910	75	1940	(35)	1970	118
11	30	41	(30)	71	96
12	52	42	(40)		
13	83	43	(10)		
14	78	44	-		
15	47	45	-		
16	124	46	-		
17	99	47	-		
18	169	48	6		
19	108	49	59		

Figures in bracket are estimates.

German catches (in metric tons) of Baltic salmon and sea trout.

Year	Month												Total		Grand total
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	I-VI	VII-XII	
1948												6.0		6.0	6.0
1949	7.9	6.1	5.4	6.2	3.5					3.0	8.8	18.1	29.1	29.9	59.0
1950	23.4	28.0	23.9	12.0	5.6					8.4	34.1	47.6	92.9	90.1	183.0
1951	27.6	36.8	30.1	9.6	1.8	0.2				0.2	1.2	28.2	106.1	29.6	135.7
1952	38.5	28.9	15.0	18.7	4.6					0.1	10.6	28.1	105.7	38.8	144.5
1953	11.8	5.5	10.2	5.8	2.3					0.1	7.8	30.9	35.6	38.8	74.7
1954	24.3	2.7	2.6	3.5	3.5					0	37.9	41.2	36.6	79.1	115.7
1955	29.0	18.0	27.7	17.1	23.7	-	-	-	-	-	16.7	25.1	115.5	41.8	157.3
1956	18.9	4.2	27.4	29.9	14.4	3.4	-	-	-	19.4	74.7	94.1	98.2	188.2	286.4
1957	73.9	30.2	44.9	26.1	11.6	-	-	-	-	20.0	70.3	67.2	186.7	157.5	344.2
1958	30.8	13.3	13.5	13.8	12.4	-	-	-	-	1.0	33.3	75.9	83.8	110.2	194.0
1959	46.3	35.0	54.9	14.2	6.3	-	-	-	-	4.5	45.5	36.5	156.7	86.5	243.2
1960	15.5	15.1	22.9	15.1	11.4	2.6	-	-	3.2	11.5	55.8	63.9	82.6	134.4	217.0
1961	50.7	52.4	20.4	20.6	3.5	-	-	-	3.5	25.8	73.7	94.4	147.6	197.4	345.0
1962	43.4	23.0	36.2	13.5	19.5	5.9	-	0.2	4.7	11.5	24.7	35.5	141.5	76.6	218.1
1963	0.3	-	-	21.5	30.3	1.5	-	-	10.4	18.4	41.7	57.1	53.6	127.6	181.2
1964	34.9	32.7	21.1	24.0	5.1	0.3	-	-	13.2	45.1	48.9	66.6	118.1	173.8	291.9
1965	37.7	18.0	29.4	17.0	18.2	1.1	-	3.4	22.5	26.8	23.6	33.2	121.4	109.5	230.9
1966	19.2	19.6	20.8	11.0	10.5	3.8	-	3.4	20.5	17.9	21.5	29.4	84.9	92.7	177.6
1967	18.0	14.7	10.9	7.0	7.5	17.8	-	-	29.2	25.5	21.4	18.4	75.9	94.5	170.4
1968	4.1	19.9	9.7	15.0	21.4	2.7	-	-	13.0	52.2	25.3	30.3	72.8	120.8	193.6
1969	4.7	12.3	5.9	4.4	2.6	1.4	-	-	35.4	19.3	12.0	23.9	31.3	90.6	121.9
1970	5.8	3.8	15.4	4.2	2.3	6.0	-	-	24.8	30.9	4.2	20.4	37.5	80.1	117.6
1971	13.7	2.5	2.7	9.8	5.9	1.8	-	-	29.3	13.8	7.2	9.4	36.4	59.7	96.1

German catch per unit effort of salmon in the Baltic
(weighted seasonal mean).

<u>Season</u>	Number of salmon	
	<u>per 100 nets</u>	<u>per 1000 hooks</u>
1954/55	-	12.9
55/56	9.0	10.8
56/57	7.2	18.9
57/58	8.7	12.0
58/59	10.5	18.1
59/60	6.3	9.2
1960/61	8.4	11.6
61/62	8.7	15.2
62/63	5.7	9.1
63/64	9.0	14.7
64/65	7.6	11.7
65/66	7.2	21.6
66/67	6.5	18.9
67/68	7.0	15.4
68/69 ⁺)	7.6	13.3

About 1962/63 through 1956/66 hemp were replaced by nets of synthetic material, and the length of the strops connecting the net with the floater-line was reduced from 40-60 cm to 10-15 cm. (See notes to the Danish data p. ...).

⁺) preliminary

Catch statistics

Country: Finland

Notes to the tables

Weight: Ungutted

Sea trout: Included 8-10 % of the catches.

Gulf of Bothnia: Mainly offshore fishery with long lines and drift nets in the Bothnian Sea and coastal fishery with bagnets in the Bothnian Bay.

Gulf of Finland: Mainly offshore fishery with long lines. During World War II no fishing took place in the eastern part of the Gulf.

Isle of Åland: Offshore fishery chiefly in the Baltic main basin and in the Gulf of Bothnia with drift nets and to a less extent with long lines, but a small part of the fishery is carried out in the Gulf of Finland. Salmon fishing has been carried out in earlier times from the Isle of Åland, but catches were insignificant until 1946.

Rivers: For the years 1877-1919 the catch statistics of Gulf of Finland rivers included the catches of lake Ladoga. For the years 1945-52 the catch statistics of Gulf of Bothnia rivers included the catches of river Tana (running to the Arctic Ocean). River catches of salmon were 10-20 tons in the 50-ies and now about 2-3 tons annually.

Ref.: 1877-1902: Statistisk årsbok för Finland. Statistiska Centralbyrån 1903 Helsingfors.
1903-1920: Statistisk årsbok för Finland 1905-1922.
1921-1935: Järvi, T.H., 1938: Fluctuations in the Baltic stock of salmon. Cons.p.J.Explor.de la Mer, Rapp. et Proc.-Verb. CVI, p. 1-114.

1936-1944: Järvi, T.H., 1948: On the periodicity of salmon reproduction in northern Baltic area and its causes. Cons.p.J.Explor. de la Mer, Rapp. et Proc.-Verb. 119, 1-113.

1945-1952: Statistisk årsbok för Finland 1946-1953. Statistiska Centralbyrån 1948-1954, Helsingfors.

1953: Liedes, M., 1954: Kalansaalis ja sen arvo v. 1953. - Suomen Kalastuslehti 61: 175-180.

1959: Heikkinen, J., 1960: Vuoden 1959 kalasaali-sarvio. - Suomen Kalastuslehti 67: 146-151.

1962-1970: Official statistics (unpublished data).

Finnish catches (in metric tons) of Baltic salmon and sea trout.

Year	Gulf of Bothnia and Gulf of Finland		Year	Gulf of Bothnia		Gulf of Finland		Total
	Sea	Rivers		Sea	Rivers	Sea	Rivers	
			1903	63	62	7	186	318
			04	44	71	30	82	227
			1905	42	85	17	64	208
			06	30	75	62	68	235
1877	444		07	54	56	88	104	302
78	396		08	52	72	69	91	284
79	382		09	52	68	53	76	249
1880	414		1910	71	63	49	66	249
81	435		11	68	52	43	64	227
82	366		12	62	61	45	50	218
83	398		13	69	60	48	46	223
84	573		14	65	50	43	38	196
1885	660		1915	108	82	44	38	272
86	595		16	215	82	41	50	388
87	762		17	128	98	39	28	293
88	657		18	112	91	25	20	248
89	642		19	114	92	31	20	257
1890	643		1920	147	97	53	4	301
91	538		21	204	121	41	5	371
92	590		22	148	102	47	4	301
93	592		23	128	167	56	3	354
94	564		24	122	140	37	3	298
1895	585		1925	130	58	26	4	218
96	548		26	118	45	25	4	192
97	587		27	91	42	21	6	160
98	437		28	96	43	35	4	178
99	501		29	104	43	32	3	182
1900	371		1930	134	46	23	4	207
01	224		31	172	41	45	3	261
02	310		32	160	42	62	1	265
			33	132	92	27	0	251
			34	168	66	32	0	266
			1935	161	61	76	0	298

Finnish catches (in metric tons) of Baltic salmon and sea trout

Year	Gulf of Bothnia		Gulf of Finland		Isle of Åland	Total
	Sea	Rivers	Sea	Rivers	Sea	
1936	142	60	19	2		223
37	127	33	18	2		180
38	103	23	19	2		147
39	99	39	13	2		153
1940	135	23	4	1		163
41	128	39	3	0		170
42	185	33	9	0		227
43	225	40	7	1		273
44	222	45	8	1		276
1945	-	-	-	-		244
46	465	124	7	-	3	599
47	386	237	7	-	2	632
48	278	144	7	-	4	433
49	245	61	8	-	7	321
1950	370	60	18	-	11	459
51	323	40	19	-	9	391
52	327	36	43	-	13	419
53	207	6	101	-	39	353
54	-	-	-	-		-
1955	-	-	-	-		-
56	-	-	-	-		-
57	-	-	-	-		-
58	-	-	-	-		-
59	247	-	30	-	16	293
1960	-	-	-	-		-
61	-	-	-	-		-
62	-	-	-	-		342
63	254	-	78	-	37	369
64	285	-	119	-	63	467
1965	170	-	103	-	68	341
66	125	-	91	-	98	314
67	168	-	114	-	143	425
68	151	-	118	-	197	466
69	197	-	140	-	169	506
1970	193	-	136	-	121	450

Finnish catches of salmon and sea trout (in metric tons) by registered fishing boats in Gulf of Bothnia.

Year	Months				Total
	I-III	IV-VI	VII-IX	X-XII	
1966	-	0	0	1	1
1967	0	2	0	11	13
1968	0	2	0	11	13
1969	2	2	2	10	16
1970	1	1	2	11	15

Finnish catches of salmon and sea trout (in metric tons) by registered fishing boats in Gulf of Finland.

Year	Months				Total
	I-III	IV-VI	VII-IX	X-XII	
1966	1	13	0	37	51
1967	4	16	1	29	50
1968	2	17	6	33	58
1969	18	8	25	66	117
1970	10	5	12	38	65

Finnish catches of salmon and sea trout (in metric tons) by registered fishing boats from Isle of Åland.

Year	Months				Total
	I-III	IV-VI	VII-IX	X-XII	
1966	-	2	57	24	83
1967	2	19	85	37	143
1968	3	1	68	115	187
1969	10	14	79	47	150
1970	6	8	52	33	99

Polish salmon and sea trout catch statistics

Notes to the tables

Weight: gutted and ungutted

Salmon sea fishing: Coastal and offshore.

Gear: Drift nets, hooks and long lines.

Fishing area: Gulf of Gdańsk and Baltic main basin.

Salmon river fishing: For the present less than 1 ton annually.

Sea trout sea fishing: Coastal.

Gear: Gill nets.

Fishing Area: Mainly Gulf of Gdańsk.

Sea trout river fishing: Including catches in lakes and Firth of Vistula and Firth of Szczecin, comprising however only a small proportion of the total river catches. The main part of the catches in river Vistula.

Gear: Gill nets, fyke nets and electrofishing in the upper parts of the river systems.

Ref.: Sea catches 1920-1955 Chrzan, F.: Prace MIR 1959, No 10/A
1956-1968 Chrzan, F.: ICES CM 1959, No 30 and personal communication
1969 Chrzan, F.; ICES CM 1970/M:3
1970-1971 The data of Sea Offices and Fishing Cooperatives compiled by R. Sych
River Catches 1920-1952 From various published and unpublished notes, compiled by R. Sych
1953-1971 The data of Fishing Cooperatives, Polish Angling Association and State Fish Farms compiled by R. Sych.

Polish catches (in metric tons) of salmon and sea trout in the Baltic Sea and in rivers.

<u>Year</u>	<u>Sea</u>		<u>River</u>
	<u>Salmon</u>	<u>Sea trout</u>	<u>Sea trout</u>
1920-24	78)	-)
1925-29	132)	-)
1930-34	84)Annuals	-	10)Approximate
1935-39	48)means	-)annual mean
1940-44	-)	-)
1945	11	17)
46	213	66)
47	416	64	100)Approximate
48	346	60)annual mean
49	240	47)
1950	313	54	86)Approxi-
51	82	46	84)mately
52	43	24	40
53	24	47	56
54	43	102	83
1955	17	26	40
56	156	41	33
57	133	52	61
58	134	70	64
59	79	160	98
1960	64	256	138
61	50	142	69
62	55	239	51
63	52	283	44
64	33	324	73
1965	12	164	60
66	6	110	33
67	7	54	20
68	7	133	40
69	27	58	31
1970	10)Approxi-	56	28
71	10)mately	41	29

Polish catches of salmon (in metric tons) in the Baltic Sea.

Year	Months												Total
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
1957	26.7	2.1	11.2	37.0	20.7	3.7	-	-	-	0.1	9.2	22.3	133.0
1958	22.0	3.4	3.0	45.7	19.2	-	-	-	-	-	11.8	28.9	134.0
1959	16.8	0.8	-	49.7	-	-	-	-	-	-	7.5	4.6	79.4
1960	2.0	1.1	14.2	9.3	1.8	-	-	-	-	-	15.3	20.4	64.1
1961	10.4	4.8	2.4	10.3	0.8	-	-	-	-	1.1	5.3	15.3	50.4
1962	12.1	0.8	1.3	2.5	0.6	0.4	-	-	-	-	8.1	29.0	54.8
1963	0.7	0.1	0.4	14.3	3.9	-	-	-	-	1.8	5.7	25.2	52.1
1964	2.0	0.3	2.2	8.0	4.5	-	-	-	-	0.4	5.9	9.8	33.1
1965	7.3	1.3	2.2	0.6	-	-	-	-	-	-	0.1	0.9	12.4
1966	0.8	0.9	2.1	0.2	-	-	-	-	-	-	1.2	0.8	6.0
1967	0.2	1.0	1.0	0.3	-	-	-	-	-	-	2.1	2.4	7.0
1968	0.7	2.1	1.4	-	-	-	-	-	-	-	1.8	1.0	7.0

Polish catches of sea trout (in metric tons) in the Baltic Sea.

Year	Months												Total
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
1957	3.3	4.2	3.6	3.6	1.7	0.5	1.7	2.8	0.3	4.5	13.6	12.0	51.8
1958	5.6	5.3	3.9	10.3	4.4	4.1	4.1	2.4	1.3	1.8	12.1	17.9	70.2
1959	25.8	8.2	34.5	17.4	2.8	3.3	5.8	3.1	3.1	5.0	19.4	31.3	159.7
1960	10.3	9.9	38.5	30.7	16.6	9.8	18.3	3.1	1.9	13.1	56.7	47.0	255.9
1961	16.9	24.0	16.3	13.7	4.7	6.7	15.4	3.9	3.2	4.1	10.2	23.2	142.3
1962	24.7	7.5	9.6	25.5	0.8	5.1	15.2	9.6	6.4	18.5	68.0	47.7	238.6
1963	8.3	23.4	51.9	61.8	17.2	6.7	19.4	13.0	11.6	7.0	33.6	29.1	283.0
1964	33.6	10.5	27.2	27.1	8.1	1.6	26.0	20.9	12.0	16.0	84.5	56.7	324.2
1965	36.1	9.0	21.6	17.9	3.5	3.2	10.5	8.8	4.8	4.8	9.9	34.3	164.4
1966	13.2	12.0	24.8	4.5	1.0	1.3	7.7	3.7	2.9	5.9	17.9	15.2	110.1
1967	2.8	6.0	7.0	2.7	1.0	2.0	4.0	7.0	6.0	4.0	5.9	5.6	54.0
1968	8.3	19.9	8.6	2.0	7.0	5.0	28.0	11.0	12.0	6.0	12.2	13.0	133.0
1969	6.7	8.7	9.3	10.2	1.9	2.5	8.4	0.8	0.4	1.0	6.1	2.0	58.0
1970	3.2	5.0	22.6	8.1	0.5	0.2	2.4	0.3	0.4	1.4	6.6	5.3	56.0
1971	3.8	4.3	4.2	3.7	1.5	1.9	3.0	1.3	2.7	3.4	5.1	6.1	41.0

Catch statistics

Country: Sweden

Notes to the tables

Weight: Gutted

Sea trout: Not included

Gear: Mainly offshore fishery with long lines and drift nets with increasing dominance of drift nets. Before 1945 anchored lines with one hook only, and drift nets were used.

To a less extent coastal fishery with big traps. This fishery is carried out only at the east coast and especially in the Gulf of Bothnia.

In rivers mainly fixed engines and draft seine fishing.

Fishing areas: Baltic sea main basin, Gulf of Bothnia and rivers.

Ref: Data for the years 1915-1949 from Alm (The Salmon Catch and the Salmon Stock in the Baltic during Recent Years; Svenska Vattenkraftföreningens publ. 1954:5); for the years 1950-1960 from Alm (Salmon Res. Inst. Report 8/1961); for the years 1961-1970 from Sjögren (Salmon Res. Inst. Report 9/1962, 6/1963, 12/1964, 12/1965, 7/1966, 12/1967, 6/1968, 6/1969, 6/1970 and 9/1971) and for the year 1970 from Sallerberg (Salmon Res. Inst. Report 4/1972.

Swedish salmon catches in the Baltic and in the Baltic rivers 1915-1949.

(1915-1939 5 year averages and from 1940 each year).

Year	Baltic Sea		Rivers		Total Swedish catches Metric tons
	Metric tons	%	Metric tons	%	
1915-19	150	53,2	131	46,8	281
1920-24	281	60,0	187	40,0	468
1925-29	203	-	-x)	-x)	-
1930-34	312	75,7	100	24,3	412
1935-39	256	69,4	113	30,6	369
1940	176	67,4	85	32,6	261
1941	267	63,9	151	36,1	418
1942	345	67,7	165	32,3	510
1943	592	70,7	246	29,3	838
1944	700	76,5	215	23,5	915
1945	1233	69,2	548	30,8	1781
1946	1474	70,6	613	29,4	2087
1947	1217	74,3	421	25,7	1638
1948	1248	75,3	410	24,7	1658
1949	1102	75,1	365	24,9	1467

x) no data available

Swedish salmon catches in the main Baltic basin, Gulf of Bothnia and in the Baltic rivers 1950-1971.

Year	Baltic Sea Main basin		Gulf of Bothnia		Baltic cat- ches total	Rivers		Total Swe- dish catches
	Metric tons	%	Metric tons	%	Metric tons	Metric tons	%	Metric tons
1950	943	67	456	33	1399	351	20	1750
1951	713	65	385	35	1098	211	16	1309
1952	454	57	337	43	791	221	22	1012
1953	258	63	154	37	412	171	29	583
1954	354	74	127	26	481	100	17	581
1955	175	59	121	41	296	107	27	403
1956	522	78	148	22	670	142	18	812
1957	176	52	164	48	340	123	28	472
1958	177	61	111	39	288	107	27	395
1959	206	57	152	43	358	114	24	472
1960	291	69	134	32	425	114	21	539
1961	319	60	217	40	536	209	28	745
1962	176	51	172	49	348	134	28	482
1963	210	60	139	40	349	95	21	444
1964	403	71	164	29	567	101	15	668
1965	314	68	147	32	461	108	19	569
1966	247	67	121	33	368	75	17	443
1967	331	74	121	26	444	99	18	543
1968	308	74	109	26	417	97	19	514
1969	333	80	85	20	418	69	14	487
1970	310	76	101	24	411	-	-	
1971	249	71	99	29	348	-	-	

Swedish salmon catches in metric tons in the Baltic (main basin) per month, 1956-1971 half years and calendar years.

Year	Months												Total		Grand total
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	I-VI	VII-XII	
1956	5	5	-	37	52	5	-	42	104	42	167	68	99	423	522
1957	23	12	9	12	16	2	2	10	20	40	23	7	74	102	176
1958	1	-	7	41	34	5	-	4	5	46	23	11	88	89	177
1959	2	8	44	33	31	10	-	-	4	43	21	10	128	78	206
1960	3	3	46	32	14	12	6	3	84	50	29	9	110	181	291
1961	6	6	45	58	16	3	3	13	77	64	22	6	134	185	319
1962	2	-	6	38	41	14	-	4	28	30	14	6	101	82	183
1963	2	1	7	12	19	4	15	4	65	56	19	6	45	165	210
1964	4	12	8	28	12	12	48	53	129	65	20	12	76	327	403
1965	9	9	34	25	13	13	22	34	82	35	22	16	103	211	314
1966	10	25	2	5	5	13	13	42	42	42	34	14	60	187	247
1967	3	6	4	6	13	30	20	90	93	33	20	13	62	269	331
1968	15	15	15	23	28	6	3	3	96	74	15	15	102	206	308
1969	20	20	13	20	20	13	7	7	97	70	33	13	106	227	333
1970	19	3	12	9	3	31	19	16	121	53	15	9	77	233	310
1971	13	3	3	5	15	5	3	25	122	22	18	15	44	205	249

Catch statistics

Country: USSR

Notes to the table

Weight: ungutted

Sea trout: Included, about 10 % of the catches.

As a rule maturing salmon enter the catches.

Salmon captured for artificial reproduction are included.

The catches are made exclusively in rivers, river mouths and in gulf areas by means of stake nets, fyke nets and stake traps.

Fishing period: June - September.

Catches of Baltic salmon and sea trout in USSR (in metric tons)

Year		
1930-34	253	Annual mean.
1935-39	195	"-
1940-44	-	
1945-49	215	"-
1950-54	142	"-
1955-59	200	"-

1957	64	
58	68	
59	84	
1960	83	
61	134	
62	170	
63	182	
64	189	
65	192	
66	173	
67	126	
68	148	
69	135	
1970	101	
71	95	

SECTION 5 STOCK ASSESSMENTS

5.1 Population models based on Swedish tagging experiments.

5.1.1 Model based on tagging experiments in 1950-1955 (B. Carlin, 1959).

Three factors affect the number of salmon of a certain year class in the Baltic Sea, fishing mortality, spawning migration and natural mortality.

Losses to the population caused by fishing can be estimated fairly correctly from recaptures of tagged fish even if they are a little too low as a consequence of tagging mortality and lost and unreported tags.

Escapement from the feeding grounds by spawning migration can be estimated from data on river and coastal catches and from the ratios of catch and escapement in rivers of ascending, tagged fish.

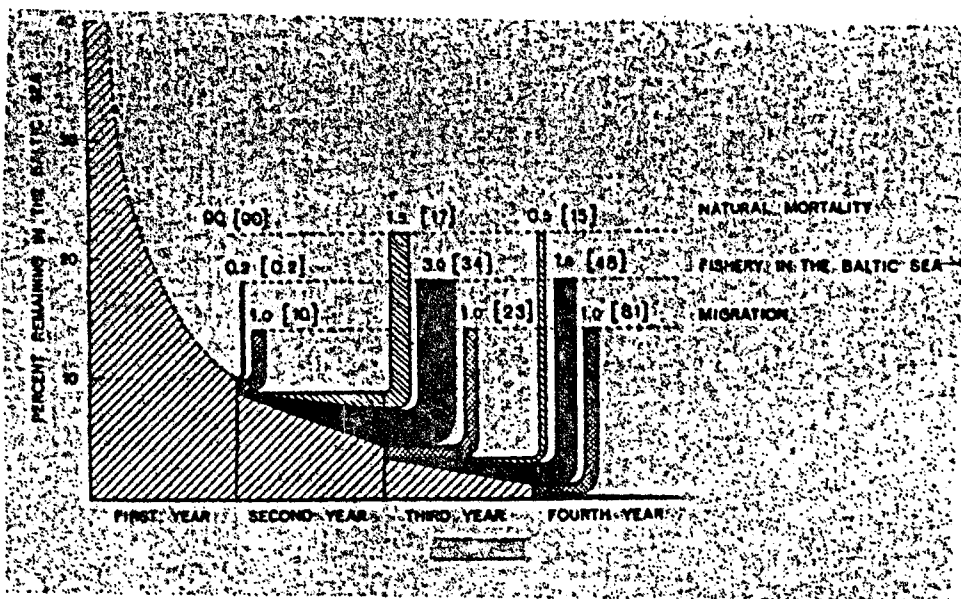
Losses to the population caused by natural mortality are unknown, but may be considered as the remaining mortality, if the two other factors can be estimated. The problem, however, is to distribute appropriate proportions of these natural losses among single age groups.

An estimate can be made on the following three assumptions,

- (a) that few of the original population remain as maiden fish in the Baltic after three years,
- (b) that the difference between natural mortality in the second and third year is small and,
- (c) that the natural mortality in the first year is 90 % (an initial mortality of, for instance 80 % implies that the losses afterwards from natural mortality are twice or three times those caused by fishing).

On the suppositions above a model of the population dynamics of Baltic salmon has been constructed (Fig. 5.1.1). According this very slight fluctuations in the initial mortality may cause considerable fluctuations in the surviving salmon stock. From a practical point of view this means that an improvement

Fig. 5.1.1 Percentage losses by migration, fishing and natural mortality of a year class of salmon in the Baltic. (Figures in brackets: percentage losses of the stock remaining at the beginning of the year).



in the condition of the smolts released from the hatcheries may have a very favourable influence on the yield.

Ref.: Carlin, B., Results of Salmon smolt tagging in the Baltic area. ICES Rapp. Proc. -Verb. 147:89-96. Vandringsfiskutredningen. Meddelande 7/1959.

5.1.2 Model based on tagging experiments in 1957 (Carlin, 1962), involving 82723 released smolts resulting in 9242 recaptures after the post smolt stage.

The model has been constructed according to the principle of 5.1.1, the recapture data however were not used directly as estimates of the losses to the exploited stock in the sea.

The values of recaptures in the Baltic - representing losses to the population caused by fishing - have been increased by 10 %, to allow for lost and unreported tags.

The values of recaptures in rivers and river mouths - representing escapement from the feeding grounds by spawning migration - have been increased by 100 % during second summer and 30 % during the subsequent summers, to allow for the exploitation rate in the rivers and recaptures in the Gulf of Bothnia.

Losses to the population caused by natural mortality may still be considered as the remaining mortality, so that the sum of losses from the stock equals the original number recruited to the Baltic. In the model natural losses of 10 %, 20 % and 30 % are successively applied to the exploited stock in the 2nd, 3rd and 4th year in the sea. On these assumptions the mortalities during the 1st year in the sea are estimated to 85.5 %, 83.4 % and 80.0 % respectively.

Table 5.1.1 show the population dynamics of the tagging experiment in 1957, when natural mortality in the sea-age-groups 2, 3 and 4 is assumed to be 10 %.

On basis of the model assessments have been made on the effect of changes in effort and age at first capture. As shown by Table 5.1.2 the starting point is 100 salmon at the beginning of the 2nd year in the sea and supposed natural mortalities of 10 %, 20 % and 30 %. With a decrease in fishing effort of 10 % and 20 % during 2nd year in the sea and 10 % during the

subsequent years size and distribution of total catches in rivers and in the sea are estimated by number, weight and value of salmon.

As demonstrated by the table this kind of regulation is the more effective the lower the natural mortality. Obviously a decrease in the sea fishing effort will increase the escape-ment to the rivers and consequently the river catches. In terms of value the coastal and river fishery earn an additional income of 40 % - 27 % corresponding with natural mortalities of 10 % - 30 %, where as the sea fishery on the same conditions is subjected to change of +3 % to -2 %.

Ref.: Carlin, B., Synpunkter på frågan om Östersjöns laxbestånd i belysning av de svenska märkningsförsöken. Laxforskningsinstitutet (5), 1962.

Table 5.1.1 Estimated mortalities of salmon in the Baltic based on a tagging experiment in 1957 and on the assumption of a natural mortality of 10 % in the age groups 2, 3 and 4.

	Percentage of number tagged				Percentage of the number of survivors at the beginning of each year			
	at the beginning of the year	migrating back to the river	remaining in the Baltic sea	caught in the Baltic sea	natural mortality	migrating back to the river	caught in the Baltic sea	natural mortality
Year 1	100			0,13				85,5
2	14,37	1,42	12,95	5,93	1,30	9,88	45,79	10
3	5,72	1,55	4,17	2,75	0,42	27,10	65,95	10
4	1,00	0,68	0,32	0,11	0,03	68,00		10
5	0,18	0,09	0,09	0,02				

Table 5.1.2 The fishing yield of a salmon population in the Baltic comprising 100 salmon at the beginning of the 2nd year in the sea, when different values of natural mortality and fishing effort are assumed.

Assumed natural mortality %	Assumed decrease in fishing effort		Caught in the Baltic sea in percent of the number at the beginning of the year		Number			Weight kg			Total gross value Sv.Kr.		
	second winter	third and fourth winter	second winter	third and fourth winter	Baltic sea	River and Coast	Total	Baltic sea	River and Coast	Total	Baltic sea	River and Coast	Total
10	0	0	46	66	56,16	16,82	72,98	237	77	314	2438	744	3181
	10	10	41	59	52,59	19,34	71,93	230	96	326	2430	943	3373
	20	10	35	59	50,00	21,10	71,10	231	106	338	2510	1052	3562
20	0	0	40	60	48,94	15,78	64,72	204	72	277	2084	691	2775
	10	10	36	54	45,67	16,56	62,23	196	82	277	2025	809	2834
	20	10	32	54	43,79	17,67	61,46	195	89	284	2065	878	2944
30	0	0	32	50	40,44	12,25	52,69	171	57	228	1769	548	2317
	10	10	29	45	37,73	13,65	51,38	163	67	231	1710	662	2372
	20	10	26	45	36,17	14,39	50,56	162	72	234	1732	708	2440

5.1.3 Model based on tagging experiments in 1958-1967 (P.-O. Larsson, the Swedish Salmon Research Institute, personal communication) involving 723380 released smolts resulting in 89161 recaptures after the post smolt stage.

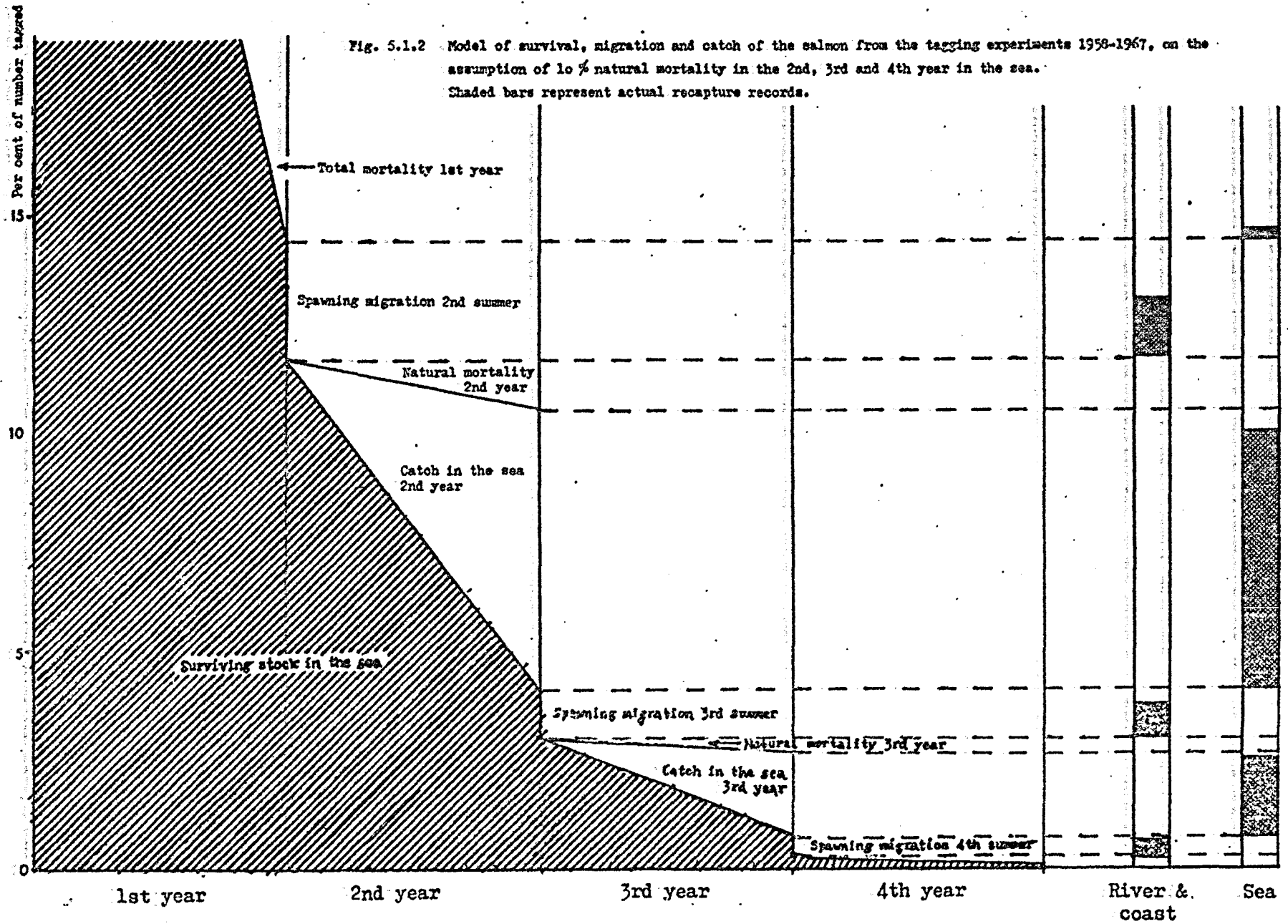
Using the results of tagging experiments carried out during 1958-1967, the population model constructed by Carlin (1962) can be revised. The extensive material forms a more reliable basis for the assessments than the 1957 experiment, but does not change the estimates significantly.

The same course of procedure as in 5.1.2 is pursued. The only difference in relation to the original Carlin model is that the number of salmon after 3 years in the sea is not considered to be zero, but according to the experiments in question are estimated to be 0.08 % of the original population.

Table 5.1.3 shows the resulting parameters, and may be compared with Table 5.1.1. Fig. 5.1.2 demonstrates graphically the recapture figures and the population model constructed on this basis.

Table 5.1.3 Estimated mortalities of salmon in the Baltic based on a tagging experiments in 1958-1967 and on the assumption of a natural mortality of 10 % in the age groups 2, 3 and 4.

year	Percentage of number tagged				Percentage of the number of survivors at the beginning of each year			
	at the beginning of the year	migrating back to the river	remaining in the Baltic sea	caught in the Baltic sea	natural mortality	migrating back to the river	caught in the Baltic sea	natural mortality
1	100			0,17				85,35
2	14,48	2,75	11,73	6,44	1,17	18,99	54,90	10
3	4,12	1,10	3,02	2,04	0,30	26,17	67,55	10
4	0,68	0,50	0,18	0,10	0,02	73,53	55,56	10
5	0,08	0,05	0,03	0,01				



5.2 Mortality parameters estimated on basis of catch and effort data and recapture records from Swedish tagging experiments (O. Christensen and F. Thurow, 1964).

This population study deals exclusively with Baltic salmon in their second and third year in the sea, roughly speaking the exploited marine phase. The material used in the assessments is partly catch and effort data from the fishing seasons 1957/58 - 1963/63, compiled by the nations exploiting salmon in the Baltic sea, and partly recapture data from the Swedish tagging experiments 1953 - 1961.

Total mortalities are estimated as ratios of abundances of age groups. As indices of abundance, catch-per-unit-effort data, age composition data and recapture rates are applied alternatively.

As the amount of fishing changed significantly during the period dealt with, total mortality can be divided into fishing mortality and natural mortality + spawning migration by correlating the coefficients of total mortality with corresponding fishing efforts.

From the equations

$$Z_1 = F_1 + (M_1 + T_1)$$

$$Z_2 = F_2 + (M_2 + T_2)$$

- relating the coefficients of total mortality (Z) to the coefficients of fishing mortality (F), natural mortality (M) and spawning migration (T) of the two age groups in question - it appears that the sum of natural mortality and spawning migration can be split up into the two components, when Z_1 , Z_2 , F_1 and the ratio of T_1 and T_2 are known and on the assumption that both $F_1 = F_2$ and $M_1 = M_2$.

Z_1 , Z_2 and F_1 are estimated as earlier mentioned.

The ratio of T_1 and T_2 is estimated from the relation between

recaptures of A.2 and A.3 spawners.

That $F_1 = F_2$ is based on the assumption that selection by long line hooks - by far the most dominating gear at that time - is insignificant in this respect that the relative proportion of the two age groups retained by drift nets was found to be rather uniform.

Based on the knowledge of predators in the Baltic, M is considered to remain virtually the same after the first year of sea life.

By the methods above following estimates were obtained:

<u>A.1+ - A.2+</u>		<u>A.2+ - A.3+</u>	
F	0.73	F	0.73
M	0.10	M	0.10
T_1	0.50	T_2	1.40
Z_1	1.33	Z_2	2.23

Ref.: Christensen, O. and Thurow, F.: Report on Population Dynamics in Baltic Salmon. ICES CM 1964. No 46.

5.3 Mortality estimates and stock assessment based on catch and effort data (F. Thurow, 1966).

Based on data from the German fishery in the years 1957-1963 an attempt was made to assess the dynamics of the offshore salmon population in the Baltic.

Instantaneous rates of losses for the two most important sea age-groups have been estimated by means of catch and effort data. In the first instance F was assumed to be the same for both ages and $M = 0.1$ (after Christensen 1964). Application of the values found did not result in the actual proportions of the yields of each age. The conclusion of this treatment was that fishing is selective, F being higher for age .2+ than for .1+. However, two equations were established, the proportion of the numbers caught in the second and in the third year in the sea and the proportion of the spawners after the second and the third year, the values of these proportions being known empirically. Wide ranges of instantaneous losses were then successively applied to these equations. This method revealed that the parameters could take values only within certain limits (e.g. the instantaneous rate of losses due to spawning migration: $0.3 < T_2 < 0.6$). Thus, the averages found were

A.1+ : $M = 0.1$	$F = 0.63$	$T = 0.45$
A.2+ : $M = 0.1$	$F = 1.61$	$T = 1.48$

Calculations using these data indicated that there were 1.1 million salmon in the exploited phase and that the annual recruitment to the fishery in the Baltic sea was 850.000 salmon.

APPENDIX
THE BALTIC SALMON
FISHERIES CONVENTION

THE BALTIC SALMON FISHERIES CONVENTION OF 1962

Agreement between Denmark, Sweden and the Federal Republic of Germany on protection of salmon in the Baltic

Stockholm 20 December 1962

(Översättning)

Overenskomst angående beskyttelse af laksebestanden i Østersøen

Kongeriget Danmark, Forbundsrepublikken Tyskland og Kongeriget Sverige er ud fra ønsket om at afslutte en overenskomst om beskyttelse af laksebestanden (*Salmo salar*) i Østersøen enedes om følgende:

Artikel 1.

Det område, på hvilket denne overenskomst finder anvendelse, omfatter Østersøen, herunder Den botniske Bugt og Finske Bugt. Dette område begrænses mod Øresund samt Store Bælt og Lille Bælt af følgende linier:

- a) Falsterbo fyr—Stevns fyr.
- b) Jungshoved—Bøgenæssand.
- c) Hestehoved fyr—Maddes klint.
- d) Skelby kirke—Flinthorne Odde.
- e) Kappel kirke—Gulstav.
- f) Ristingehale—Ærøhale.
- g) Skjoldnæs—Pøls Huk.
- h) Chr. d. X's bro ved Sønderborg.

Artikel 2.

Ingen bestemmelse i denne overenskomst må fortolkes således, at den gør indskrænkning i den eneret, der tilkommer en kontraherende parts skibe til at drive fiskeri i farvande, hvor fiskeriet udelukkende er undergivet den kontraherende parts højhedsret.

Artikel 3.

Ingen bestemmelse i denne overenskomst må fortolkes således, at den gør indskrænkning i en kontraherende parts krav med hensyn til søterritoriets grænser.

Artikel 4.

Bestemmelserne i denne overenskomst finder anvendelse på alle de kontraherende parter tilhørende skibe, som befinder sig indenfor eller udenfor de farvande, i hvilke fiskeriet udelukkende er undergivet en kontraherende parts højhedsret.

Übereinkommen über den Schutz des Lachsbestandes in der Ostsee

Das Königreich Dänemark, die Bundesrepublik Deutschland und das Königreich Schweden sind, in dem Wunsch ein Übereinkommen über den Schutz des Lachsbestandes (*Salmo salar*) in der Ostsee abzuschliessen, wie folgt übereingekommen:

Artikel 1.

Der Anwendungsbereich dieses Übereinkommens umfasst die Ostsee einschliesslich des Bottnischen Meerbusens und des Finnischen Meerbusens. Dieses Gebiet wird gegen den Öresund und den Grossen und den Kleinen Belt durch folgende Linien begrenzt:

- a) Falsterbo Feuer—Stevns Feuer.
- b) Jungshoved—Bøgenæssand.
- c) Hestehoved Feuer—Maddes Klint.
- d) Skelby Kirche—Flinthorne Odde.
- e) Kappel Kirche—Gulstav.
- f) Ristingehale—Ærøhale.
- g) Skjoldnæs—Pøls Huk.
- h) Christian X-Brücke bei Sønderborg.

Artikel 2.

Keine Bestimmung dieses Übereinkommens darf so ausgelegt werden, dass sie das ausschliessliche Recht von Schiffen einer Vertragspartei beeinträchtigt, Fischfang in Gewässern zu betreiben, in denen die Vertragspartei ausschliessliche Hoheitsgewalt über die Fischerei hat.

Artikel 3.

Keine Bestimmung dieses Übereinkommens darf so ausgelegt werden, dass sie die Ansprüche einer Vertragspartei bezüglich der Grenzen ihrer Hoheitsgewässer beeinträchtigt.

Artikel 4.

Die Bestimmungen dieses Übereinkommens sind auf alle Schiffe der Vertragsparteien anzuwenden, die sich innerhalb oder ausserhalb der Gewässer befinden, in denen eine Vertragspartei die ausschliessliche Hoheitsgewalt über die Fischerei hat.

Överenskommelse rörande skydd för beståndet av lax i Östersjön

Konungariket Danmark, Förbundsrepubliken Tyskland och Konungariket Sverige, vilka önska träffa överenskommelse om åtgärder till skydd för beståndet av lax (*Salmo salar*) i Östersjön, ha överenskommit om följande:

Artikel 1.

Det område, på vilket denna överenskommelse äger tillämpning, omfattar Östersjön, vari inbegripes Bottniska Viken och Finska Viken. Detta område begränsas mot Öresund samt Stora och Lilla Bält av följande linjer:

- a) Falsterbo fyr—Stevns fyr.
- b) Jungshoved—Bøgenæssand.
- c) Hestehoved fyr—Maddes Klint.
- d) Skelby kyrka—Flinthorne Odde.
- e) Kappel kyrka—Gulstav.
- f) Ristingehale—Ærøhale.
- g) Skjoldnæs—Pøls Huk.
- h) Christian X:s bro i Sønderborg.

Artikel 2.

Ingen bestämmelse i denna överenskommelse skall anses inkräkta på den uteslutande rätt, som tillkommer fördragsslutande parts fartyg att bedriva fiske på vatten, varöver denna fördragsslutande part har uteslutande jurisdiktion med avseende å fisket.

Artikel 3.

Ingen bestämmelse i denna överenskommelse skall anses inkräkta på någon fördragsslutande parts anspråk ifråga om gränserna för territorialvattnet.

Artikel 4.

Bestämmelserna i denna överenskommelse äga tillämpning på de fördragsslutande parternas samtliga fartyg, vilka befinna sig på eller utanför vatten, där den fördragsslutande parten har uteslutande jurisdiktion med avseende å fisket.

Artikel 5.

De kontraherende parter tillader ikke, at der til laksefiskeri med garn eller kroge benyttes redskaber, der har andre mål end de nedenfor nævnte:

Drivgarn til laksefangst skal være af en sådan beskaffenhed, at et fladt måleinstrument af en tykkelse på 2 millimeter let kan trækkes igennem det våde garns i længderetningen diagonalt udtrukne masker. Dette måleinstruments bredde skal for så vidt angår drivgarn af naturlige fibre og drivgarn af syntetiske fibre udgøre henholdsvis 165 millimeter og 157 millimeter.

Drivgarn, der allerede er i brug, og hvis maskestørrelse er mindre end 170 millimeter (garn af naturlige fibre) henholdsvis mindre end 160 millimeter (garn af syntetiske fibre) kan, indtil de er slidt op, fortsat anvendes, dog ikke udover 5 år, regnet fra dagen for denne overenskomstskriftens ikrafttræden.

Spændvidden for fiskekroge (korteste afstand mellem krogspids og skaft) i drivlinor og faste linor, der anvendes til laksefangst, skal udgøre mindst 19 millimeter. Fiskekroge, der allerede er i brug, og hvis spændvidde udgør mindre end 19 millimeter, kan fortsat anvendes, dog ikke udover 3 år, regnet fra dagen for denne overenskomstskriftens ikrafttræden.

Artikel 6.

Intet skib må beholde laks ombord, som er fanget i de i artikel 1 angivne farvande, og som ikke har et mindstemål af 60 centimeter (målt fra snudespids til halefinnens yderste endepunkt). Sådanne laks skal straks igen udsættes i havet.

Artikel 7.

Enhver af de kontraherende parter forpligter sig til at fastsætte regler, der forbyder at ilandbringe, tilbyde, i salgssjemed opbevare, falbyde, sælge, på anden måde omsætte eller med videresalg for øje købe laks, der ikke har det i Artikel 6 angivne mindstemål. Et sådant forbud angår kun laks, der er fanget i de i artikel 1 i denne overenskomst angivne farvande.

Artikel 5.

Die Vertragsparteien werden nicht zulassen, dass bei der mit Netzen oder Angeln betriebenen Lachsfischerei Geräte benutzt werden, die andere als die nachstehend vorgeschriebenen Masse haben:

Treibnetze zum Fang von Lachsen müssen so beschaffen sein, dass ein flaches Messinstrument mit einer Stärke von 2 Millimetern leicht durch die diagonal in die Länge gezogenen Maschen des nassen Netzes gezogen werden kann. Die Breite dieses Messinstruments hat für Treibnetze aus Naturfasern 165 Millimeter, für Treibnetze aus synthetischen Fasern 157 Millimeter zu betragen.

Treibnetze, die schon in Gebrauch sind und deren Maschengröße kleiner als 170 Millimeter (Netze aus Naturfasern) bzw. kleiner als 160 Millimeter (Netze aus synthetischen Fasern) ist, dürfen weiter benutzt werden, bis sie aufgebraucht sind, jedoch nicht länger als 5 Jahre nach dem Tage des Inkrafttretens dieses Übereinkommens.

Die Spannweite der Angelhaken (kürzester Abstand zwischen Haken spitze und Schenkel) an Treibleinen und festen Leinen, die zum Fang von Lachsen verwendet werden, muss mindestens 19 Millimeter betragen. Angelhaken, die schon in Gebrauch sind und deren Spannweite weniger als 19 Millimeter beträgt, dürfen weiter verwendet werden, jedoch nicht länger als 3 Jahre nach dem Tage des Inkrafttretens dieses Übereinkommens.

Artikel 6.

Kein Schiff darf Lachse, die in den in Artikel 1 bezeichneten Gewässern gefangen worden sind, und nicht ein Mindestmass von 60 Zentimeter (gemessen von der Maulspitze bis zum äussersten Ende der Schwanzflosse) haben, an Bord behalten. Solche Lachse müssen sofort in die See zurückgeworfen werden.

Artikel 7.

Jede Vertragspartei wird Vorschriften erlassen, die verbieten, Lachse, die nicht das in Artikel 6 bezeichnete Mindestmass haben, anzulanden, anzubieten, zum Verkauf vorrätig zu halten, feilzuhalten, zu verkaufen, sonst in den Verkehr zu bringen oder zum Zweck des Weiterverkaufs zu kaufen. Ein solches Verbot bezieht sich nur auf Lachse, die in den in Artikel 1 dieses Übereinkommens bezeichneten Gewässern gefangen worden sind.

Artikel 5.

De fördragsslutande parterna skola icke tillåta att vid fiske efter lax med nät eller krok användas redskap med andra mått än som nedan angivas:

Laxdrivnäten skola vara så beskaffade, att en flat måttsticka av 2 millimeters tjocklek lätt kan föras genom maskorna, när dessa äro sträckta diagonalt i nätets längdriktning och detta är vått. Bredden på detta mätinstrument skall för drivnät av naturfiber uppgå till 165 millimeter och drivnät av syntetiska fiber 157 millimeter.

Drivnät, som redan äro i bruk och vars maskstorlek är mindre än 170 millimeter om näten äro av naturfiber respektive 160 millimeter om näten äro av syntetiska fiber, få användas fortsättningsvis till dess de äro utnötta, dock icke längre än 5 år efter dagen för denna överenskommelses ikraftträdande.

Gapet på krok (kortaste avståndet mellan krokens spets och skaft) på drivlinor och fasta linor, som användas vid fiske efter lax, skall uppgå till minst 19 millimeter. Krok, som redan äro i bruk och vars gap är mindre än 19 millimeter, få användas fortsättningsvis, dock icke längre än 3 år efter dagen för denna överenskommelses ikraftträdande.

Artikel 6.

Inget fartyg må behålla ombord inom det i artikel 1 angivna vattenområdet fångad lax, vilken är mindre än 60 centimeter (mått från nosspetsen till stjärtfenans yttersta spets). Sådant lax skall omedelbart utslättas i havet.

Artikel 7.

Varje fördragsslutande part skall utfärda föreskrifter med förbud att ilandföra, utbjuda, för försäljningsändamål hålla i lager, saluhålla, sälja, på annat sätt föra i handeln eller i återförsäljningssyfte köpa lax, som understiger det i artikel 6 föreskrivna minimimåttet. Detta förbud gäller endast lax, som fångats i det i artikel 1 av denna överenskommelse angivna vattenområdet.

Artikel 8.

Bestemmelserne i denne overenskomst finder ikke anvendelse på fiskefangst, der foregår til røgt og pleje af fiskebestanden eller til videnskabelige formål, og på de herved fangne laks. Sådanne laks kan ilandbringes til videnskabelige formål; ivotrigt finder artikel 7 anvendelse.

Artikel 9.

Enhver af de kontraherende parter forpligter sig til at fastsætte de til gennemførelsen af denne overenskomst nødvendige regler. Disse regler skal også være gældende for laksefangst i de farvande, i hvilke fiskeriet udelukkende er undergivet den kontraherende parts højhedsret.

De kontraherende parter forpligter sig til at tilstille hinanden teksterne til de regler, der fastsættes til gennemførelsen af denne overenskomst.

Artikel 10.

Der oprettes en stående kommission, i hvilken enhver af de kontraherende parter er repræsenteret ved et stemmeberettiget medlem. Enhver af de kontraherende parter kan desuden udpege sagkyndige og rådgivere. Kommissionen træffer sine beslutninger enstemmigt.

Kommissionen har til opgave at etablere og samordne tekniske kontakter med mellemfolkelige organisationer, videnskabsmænd og de kontraherende parters forskningsinstitutter med det formål at fremme laksebestanden i Østersøen, genopbygningsmetoderne og den rationelle udnyttelse af laksebestanden. Kommissionen bør yderligere på grundlag af foreliggende materiale ytre sig om formålstjenligheden af ændringer i og tilføjelser til denne overenskomst og om fornødent forelægge de kontraherende parter passende forslag.

Kommissionen fastsætter selv sin forretningsorden.

Kommissionen træder sammen efter anmodning af en af de kontraherende parter, dog mindst een gang hvert 3. år.

Kongeriget Sveriges regering indkalder snarest muligt efter denne overenskomsts ikrafttræden kommissionen til dens første møde.

Enhver af de kontraherende parter afholder omkostningerne for vedkommende parts repræsentant, sagkyndige og rådgivere.

Artikel 8.

Die Bestimmungen dieses Übereinkommens beziehen sich nicht auf den Fischfang, der zur Pflege des Fischbestandes oder zu wissenschaftlichen Zwecken betrieben wird, und auf die dabei gefangenen Lachse. Solche Lachse dürfen für wissenschaftliche Zwecke angelandet werden; im übrigen findet Artikel 7 Anwendung.

Artikel 9.

Jede Vertragspartei wird die zur Durchführung dieses Übereinkommens erforderlichen Vorschriften erlassen. Diese Vorschriften haben sich auch auf den Lachsfang in den Gewässern, in denen die Vertragspartei die ausschliessliche Hoheitsgewalt über die Fischerei hat, zu erstrecken.

Die Vertragsparteien werden sich die Texte der Vorschriften übermitteln, die zur Durchführung dieses Übereinkommens erlassen werden.

Artikel 10.

Es wird ein Ständiger Ausschuss errichtet, in den jede Vertragspartei einen stimmberechtigten Vertreter entsendet. Jede Vertragspartei kann ausserdem Sachverständige und Berater benennen. Der Ausschuss fasst seine Beschlüsse einstimmig.

Der Ausschuss hat die Aufgabe, zur Förderung des Lachsbestandes in der Ostsee, der Reproduktionsverfahren und der rationellen Ausbeutung des Lachsbestandes technische Kontakte mit zwischenstaatlichen Organisationen, Forschungsinstituten der Vertragsparteien und Wissenschaftlern herzustellen und zu koordinieren. Der Ausschuss soll ferner unter Berücksichtigung des zur Verfügung stehenden Materials über die Zweckmässigkeit von Änderungen oder Ergänzungen dieses Übereinkommens beraten und erforderlichenfalls den Vertragsparteien entsprechende Vorschläge unterbreiten.

Der Ausschuss wird sich eine Verfahrensordnung geben.

Der Ausschuss tritt auf Antrag einer der Vertragsparteien zusammen, jedoch mindestens einmal innerhalb von 3 Jahren.

Die Regierung des Königreichs Schweden wird sobald wie möglich nach Inkrafttreten dieses Übereinkommens den Ausschuss zu seiner ersten Sitzung einberufen.

Jede Vertragspartei trägt die Kosten für ihren Vertreter, ihre Sachverständigen und ihre Berater.

Artikel 8.

Bestämmelserna i denna överenskomst skola icke äga tillämpning på fiske, som bedrivs för fiskevårdande eller vetenskapliga ändamål, eller på lax, som fångas vid sådant fiske. Sådanda fångad lax må för vetenskapliga ändamål ilandföras; i övrigt äger artikel 7 tillämpning.

Artikel 9.

Varje fördragsslutande part skall utfärda för denna överenskommelses efterlevnad erforderliga föreskrifter. Dessa föreskrifter skola även inbegripa fiske efter lax å vatten, varöver den fördragsslutande parten har uteslutande jurisdiktion med avseende å fisket.

De fördragsslutande parterna skola tillställa varandra texterna till de föreskrifter, som utfärdas för denna överenskommelses efterlevnad.

Artikel 10.

Ett ständigt utskott skall upprättas, i vilket varje fördragsslutande part skall representeras av ett röstberättigat ombud. Varje fördragsslutande part kan härutöver utse sakkunniga och rådgivare. Utskottet fattar sina beslut enhälligt.

Utskottet har till uppgift att för främjandet av beståndet av lax i Östersjön, reproduktionsmetoderna och det rationella utnyttjandet av laxbeståndet utveckla och samordna tekniska kontakter med internationella organisationer, forskningsinstitut tillhörande de fördragsslutande parterna och vetenskapsmän. Vidare skall utskottet på grundval av till förfogande stående material överbäga, om det finnes skäl att företaga ändringar eller tillägg till bestämmelserna i denna överenskommelse och om så erfordras avgiva förslag härom till de fördragsslutande parterna.

Utskottet skall utarbeta sin egen arbetsordning.

Utskottet skall sammanträda på framställning av någon av de fördragsslutande parterna, dock minst en gång inom loppet av 3 år.

Konungariket Sveriges regering skall så snart som möjligt efter denna överenskommelses ikraftträdande kalla utskottet till dess första sammanträde.

Varje fördragsslutande part skall svara för kostnaderna för sitt ombud samt sina sakkunniga och rådgivare.

Artikel 11.

Overenskomsten skal ratificeres. Ratifikationsdokumenterne deponeres hos Kongeriget Sveriges regering.

Overenskomsten træder i kraft 2 måneder efter, at samtlige ratifikationsdokumenter er deponeret. Kongeriget Sveriges regering underretter de øvrige kontraherende parter om ratifikationsdokumenternes deponering og overenskomstens ikrafttræden.

Artikel 12.

De kontraherende parter kan i fællesskab beslutte at indbyde andre stater til at tiltræde denne overenskomst. En på denne måde indbudt stats tiltrædelse sker ved deponering af et tiltrædelsesdokument hos Kongeriget Sveriges regering.

Kongeriget Sveriges regering underretter de stater, som har undertegnet eller tiltrådt denne overenskomst om tidspunktet for deponeringen af tiltrædelsesdokumenterne.

Artikel 13.

Denne overenskomst kan, når der er forløbet 3 år fra dens ikrafttræden, opsiges ved skriftlig meddelelse til Kongeriget Sveriges regering. Opsigelsen har retsvirkning 12 måneder efter, at meddelelsen er kommet frem til Kongeriget Sveriges regering. Denne underretter de øvrige kontraherende parter om opsigelsen.

Til bekræftelse af dette har undertegnede befuldmægtigede underskrevet denne overenskomst og forsynet den med deres segl. Udfærdiget i Stockholm den 20. december 1962 i dansk, tysk og svensk affattelse, hvis ordlyd har samme gyldighed, i eet originaleksemplar, der deponeres hos Kongeriget Sveriges regering. Denne tilstiller regeringerne i Kongeriget Danmark og Den tyske Forbundsrepublik bekræftede afskrifter af originaldokumentet.

Artikel 11.

Das Übereinkommen bedarf der Ratifikation. Die Ratifikationsurkunden werden bei der Regierung des Königreichs Schweden hinterlegt.

Das Übereinkommen tritt 2 Monate nach Hinterlegung sämtlicher Ratifikationsurkunden in Kraft. Die Regierung des Königreichs Schweden wird die übrigen Vertragsparteien von der Hinterlegung der Ratifikationsurkunden und vom Inkrafttreten des Übereinkommens unterrichtet.

Artikel 12.

Die Vertragsparteien können gemeinsam beschließen, andere Staaten zum Beitritt zu diesem Übereinkommen einzuladen. Der Beitritt eines auf diese Weise eingeladenen Staates erfolgt durch Hinterlegung der Beitrittsurkunde bei der Regierung des Königreichs Schweden.

Die Regierung des Königreichs Schweden wird diejenigen Staaten, die dieses Übereinkommen unterzeichnet haben oder ihm beigetreten sind, über den Zeitpunkt der Hinterlegung der Beitrittsurkunden unterrichten.

Artikel 13.

Dieses Übereinkommen kann nach Ablauf von 3 Jahren nach seinem Inkrafttreten durch schriftliche Mitteilung an die Regierung des Königreichs Schweden gekündigt werden. Die Kündigung wird 12 Monate nach Eingang der Mitteilung bei der Regierung des Königreichs Schweden wirksam. Diese wird die übrigen Vertragsparteien von der Kündigung unterrichten.

Zu Urkund dessen haben die unterzeichneten Bevollmächtigten dieses Übereinkommen unterschrieben und mit ihren Siegeln versehen. Geschehen in Stockholm am 20. Dezember 1962 in dänischer, deutscher und schwedischer Fassung, deren Wortlaut gleichermassen verbindlich ist, in einer Urschrift, die bei der Regierung des Königreichs Schweden hinterlegt wird. Diese wird den Regierungen des Königreichs Dänemark und der Bundesrepublik Deutschland beglaubigte Abschriften der Urschrift übermitteln.

E. Blytgen-Petersen
(L. S.)

Dr. Karl Werkmeister
(L. S.)

Torsten Nilsson
(L. S.)

Artikel 11.

Denna överenskommelse skall ratificeras. Ratifikationsinstrumenten skola deponeras hos Konungariket Sveriges regering.

Överenskommelsen träder i kraft 2 månader efter det att samtliga ratifikationsinstrument deponerats. Konungariket Sveriges regering skall underrätta de övriga fördragsslutande parterna om deponering av ratifikationsinstrumenten och om överenskommelsens ikraftträdande.

Artikel 12.

De fördragsslutande parterna kunna gemensamt besluta att inbjuda andra stater att ansluta sig till denna överenskommelse. Anslutningen av en på detta sätt inbjuden stat sker genom deponering av anslutningsdokument hos Konungariket Sveriges regering.

Konungariket Sveriges regering skall underrätta de stater, som undertecknat eller anslutit sig till denna överenskommelse, om tidpunkten för deponeringen av anslutningsdokumentet.

Artikel 13.

Denna överenskommelse kan, sedan 3 år förflutit efter det den trätt i kraft, uppsägas genom skriftligt meddelande till Konungariket Sveriges regering. Uppsägningen blir giltig 12 månader efter det den mottagits av Konungariket Sveriges regering. Denna skall underrätta de övriga fördragsslutande parterna om uppsägningen.

Till bekräftelse härav hava undertecknade befullmäktigade ombud undertecknat denna överenskommelse och därpå anbragt sina sigill. Som skedde i Stockholm den 20 december 1962 på danska, tyska och svenska språken, vilka texter äga lika vitsord, i ett exemplar som skall deponeras hos Konungariket Sveriges regering. Denna skall sända bestyrkta avskrifter därav till Konungariket Danmarks och Förbundsrepubliken Tysklands regeringar.