

**INTERNATIONAL COUNCIL FOR  
THE EXPLORATION OF THE SEA**

C.M. 1992/M:25  
Anadromous and  
Catadromous Fish Committee

 **THÜNEN**  
Digitalization sponsored  
by Thünen-Institut



**AN OVERVIEW OF THE STATUS OF THE ATLANTIC SALMON IN EUROPE**

by

S.J. de Groot and M.J. Heesen  
Netherlands Institute for Fisheries Research  
P.O. Box 68, 1970 AB IJmuiden  
The Netherlands

AN OVERVIEW OF THE STATUS OF THE ATLANTIC SALMON IN  
EUROPE

by

S.J. de Groot & M.J. Heesen  
Netherlands Institute for Fisheries Research (RIVO-DLO)  
P.O. Box 68, 1970 AB IJmuiden  
The Netherlands

ABSTRACT

The present overview is based on literature data on the distribution of the Atlantic salmon (*Salmo salar*) in the main river systems of western Europe. Data on the distribution are compared for the periods 1870-1890, 1920-1930, 1950-1960, 1975-1985. A decline index is given. The salmon landed in Norway and Iceland, when comparing the 1920-1930 period with 1975-1985 increased about 60%. For the salmon of Portugal, Spain, France, Belgium, Netherlands, Germany and Switzerland when comparing the period 1920-1930 with the period 1950-1960 we observe a decrease of about 85%, but it should be noted that at present the salmon in Belgium, the Netherlands and Germany is extinct. The salmon of the United Kingdom and Ireland show a decrease of about 10% when comparing the period 1950-1960 with the period 1975-1985. For the situation in the Baltic it can be stated that the salmon stocks, notwithstanding enhancement schemes are on the decline. They are or nearly extinct in Poland and Russia (only salmon in the Dvina).

## 1. INTRODUCTION

The present paper is based on literature data, the grey literature of ICES included, it is an attempt to get an overview of the status of the Atlantic salmon in Europe it deals with the wild stocks of the salmon. Data on the distribution and numbers of salmon are, as far as possible, grouped into 4 periods viz.: 1870-1890; 1920-1930; 1950-1960 and 1975-1985. Notwithstanding the success of salmon culture, the wild stocks of salmon, as is well known, are on the decline in the greater part of its distribution area in Europe. Restocking takes place or is considered in many countries. If this will stem the tide has to be seen.

## 2. STATUS PER COUNTRY

### 2.1 Portugal

The Atlantic salmon originally inhabited all rivers from northern Portugal (Douro) till the border of Spain with France (Bidasoa).

The four most important salmon rivers of Portugal; are the Minho, Lima, Cavado and Douro. Catch data from 1915-1985 are available for the river Minho. The total salmon catches of Portugal are available from 1915-1934 and from 1964 to 1969. The total catches are given in tons, those caught in the river Minho in numbers.

From the data given by Valente et al (1991) it can be concluded that there is a decreasing trend in the catch since 1914 till 1985. Four peaks of high catches, above five tons a year were observed in 1917, 1927, 1929 and 1932. The catch consisted mainly of three S.W. fish (S.W.=sea winter). It is expected that the catch in a tributary of the Lima, the Tamente will soon disappear as a consequence of a dam being built in the main river. At present the Lima is the extreme south of the natural distribution of the Atlantic salmon in Europe.

### 2.2 Spain

The salmon rivers in Spain are found in the provinces Galicia, Asturias, Santander and Guipuzcoa. The most southern river is the river Minho shared with Portugal. They are usually relatively short with exception of the Minho. This last river has a length of 280 km. In old records catch data can be found. E.g. in 1971-1975 it was estimated that 2000 salmon were caught daily in Asturias. The total Spanish salmon catch in the 17th and 18th centuries is said to have been 8,000 and 10,000 fish per day, hence about 600,000-900,000 salmon per year (Netboy, 1974).

At present salmon are only found in about twenty rivers of which only six the Sella, the Cares and Marcea in Asturias and the Pas, Ason and Deva in Cantabria. These 6 rivers contribute to about 70% of the catches at present. Catch data of salmon exist only from 1949 onwards. The yearly variations show no discernible trend. Particular declines in catches in some rivers can be correlated with the construction of impassable dams, diseases (UDN), growth of industrial pollution (Garcia de Leaniz et al., 1978; Garcia de Leaniz and Martinez, 1988).

### 2.3 France

The Atlantic salmon once inhabited most of the large French rivers such as Meuse, Moselle, Seine, Loire. Dordogne and Garonne as well as nearly all short running rivers of Brittany. At present only salmon occur in parts of the Loire-Allier river system, the Dordogne and Garonne as well in the rivers of lower Normandy as Calonne, Orne Sienna

and Vire and in Brittany Leguer, Leff, du Gouët, Trieux, Aven, Steir, Pont l'Abbé, Hyères, Penzé, Odet, Elle, Belon, Jet, Goyen, Gouyère, Couesnon, Scorff, Sebrevet, Blavet, Sarre, Loc'h, Ty-Mad, Evel (Agrinon et al, 1988). Thibault (1987, 1991) analysed Atlantic salmon catch statistics- marine catch statistics from 1891 onwards, catches in the Seine estuary 1867-1894, and rod and line catches within the riverzone from 1951-1965. The evaluation of the catch showed two periods of important catches 1891 to 1895 (217-256 tons) and during two decades (1920-1940) with 2 peaks in 1927 (134 ton) and 1935 (217 tons). Since 1951 national catches are between 9.6 and 53 tons from which 8.6 to 29.8 tons are caught in the rivers and 1 to 28 tons in the estuaries.

#### 2.4 Belgium

In the 19th century Atlantic salmon was very abundant in the river Meuse. Based on an assumption that one fifth of the salmon marketed at the Rotterdam fish market came from the Meuse and four fifth from the river Rhine, Phillipart et al (1990) concluded that in the Meuse system 12,000 salmon were caught annually (extremes: 4,000-20,000). The average catch between 1920-1930 in the Meuse in Belgium was about 283 salmon. In the period 1950-1960 no salmon were caught in the Meuse. The species is now extinct in the river Meuse.

#### 2.5 Netherlands

Salmon were only caught in Dutch rivers on their way up or down to or from the spawning grounds upstream, outside the Dutch territory. Never did salmon spawn naturally in Dutch rivers. In the Dutch river fisheries for the period 1880-1890 on average 67620 salmon were caught annually, for the period 1920-1930 this was 11980 and for the period 1950-1957 it was 69. After 1957 official catch statistics came to a halt. Since then till 1991 only a few specimen were caught. Of these at least 2 specimens from Swedish ocean ranching experiments in the Baltic with salmon. At present reintroduction in the framework of the Rhine Action Program is considered. Also salmon at several juvenile stages (fry, parr, smolt) were released in small Dutch streams, however, without noticeable results (De Groot, 1989, 1992).

#### 2.6 Switzerland

In Switzerland salmon were caught in four cantons through which the river Rhine is running. Hoek (1916) provided the following information on the suitability for salmon of the following Swiss rivers. The Schaffhausen waterfall forms a natural barrier for salmon in the river Rhine. In 1914 the river Thur was already unsuitable for salmon due to river correction. Also various weirs were constructed in the river Wutach closing it off for migrating salmon. For the same reason the river Aare was lost and the number of salmon restricted in the river Reuss. Also the river Limat had lost its importance as a salmon river. Between the period 1892-1911 on average 3,200 salmon were caught annually (Staub, 1988).

#### 2.7 Germany

In Germany salmon were caught mainly in the rivers Rhine and Elbe. Hoek (1916, see also De Groot, 1992) reviewed the situation of several salmon rivers. many were lost already around the First World War for salmon, mainly by canalisation. After 1940 river improvement of the Rhine for navigation, deepening, removal of sand banks reduced the suitability for migrating salmon still further. At Kembs downstream of Basel a power station was constructed. Also the rivers of the Elsass area were lost for salmon after the Second World War. Neckar, Main and Ruhr became practically inaccessible to salmon. Also after the Second World War the construction of locks and weirs in the river Mosel

made this river unsuitable for salmon. At present salmon, if present, can only swim up the Rhine till Karlsruhe.

Several of the northeast German rivers entering the Baltic had fine spawning runs of salmon e.g. Ilmenau, Saale, Mulde and Spree. Just as in Denmark these salmon stocks became extinct in the 1920s (Netboy, 1980).

Data are available for the major salmon river the Rhine (Kühn, 1976).

Data are available for the numbers caught between 1875 and 1950. Between 1870 and 1900 on average 60,000 salmon were caught per year. In the peak year 1885 130,000 salmon were caught. In the same year in the Netherlands 104,422 salmon were landed.

## 2.8 United Kingdom

### 2.8.1 England and Wales

Despite a long history of environmental degradation Harris (1988) concluded that the distribution of salmon in England and Wales is still extensive with some 40 major and many other 'minor' rivers supporting exploited stocks in varying abundance. Catch records exist for most major salmon fisheries from the early 1950s.

At present no long time series of catch data could be traced, however, Harris (1988) gives the salmon catches for 1952-1985. When adding the salmon catches caught by rod, driftnet and all other commercial instruments it is possible to compare the 1952-1960 period with the period 1975-1985. In the first period on average 26,888 salmon were caught per year, in the period 1975-1985 on average 116,233 salmon were caught per year. This is an increase of 77%. Mills (1989) give the salmon catches expressed in tons (source ICES) for the period 1975-1987. In this whole period catches were between 208 and 447 tons and there was no noticeable upward or downward trend.

### 2.8.2 Scotland

Gardiner and Egglisshaw (1986) produced the first comprehensive map of the distribution of Atlantic salmon in Scottish rivers. The map shows the location of 93 salmon rivers, the range of adult salmon within the rivers and the extent of water closed to adult salmon by obstructions. Salmon run far into Scotland on many rivers, particularly the large rivers of the east coast (e.g. the River Spey).

Williamson (1988) gives the old-Scotland catch -rods and nets- for the years 1952-1984. The statistics do not include the drift-net catches of 1960-1962. Drift nets were operated from its inception in 1960 until it was prohibited at the end of 1962. For those years it is estimated that the catch in numbers was 1960-9,000, 1961-28,000, 1962-115,000.

Shearer (188) gives the catch records (5-years means) for e.g. the River Spey for the period 1850-1986. When comparing the average annual catch over the period 1880-1890 (28,000 salmon/yr) with the average annual catch for the periods 1920-1930 (5,600/yr); 1950-1960 (12,600/yr) and 1975-1985 (7,000/yr), we observe a decrease of 80%, 55% and 75%. We also observe (see figure) a partially recovery after the 1920-30's, followed by a further decrease.

## 2.9 Ireland

Whitaker (1988) gives the Irish salmon catch (Ireland and Northern Ireland) in tonnes for the years 1975-1985. The figures show a precipitous decline to a low point in 1981 when the total catch was one third of the 1975 figure. There has been a spasmodic recovery since 1981 but never enough to regain the 1975 total.

## 2.10 Iceland

In Iceland are 80 rivers and river systems which hold Atlantic salmon. Most of them are found in the western half of the country such as the Nordura, Grimsa, Ulfarsa, Ellidaar, Ölfusa-Hvita but also in the north the Blanda. Gudjonsson (1988) gives the number of

Atlantic salmon caught by rod-and-line and gill nets in Iceland from 1964 to 1986 also he give the catches of ocean ranched salmon from 1966 to 1986.

### **2.11 Norway**

In Norway salmon are found in rivers along the coast on the border with Russia to the border with Sweden. At present there are between 400 and 500 rivers and streams populated by Atlantic salmon. The life history patterns and morphology vary considerably between populations and reflect the great variability between the river systems. Hansen (1988).

Hansen (1988) gives the catch data for 1876-1986. The total catch is divided into the sea catch and the river catch. For the present study only the river catch has been considered initially the total catches increased but from, 1900 to about 1950 they were remarkably stable. From the beginning of 1950s the total catch increased considerably and reached a peak in the middle of the 1960s. This increase was probably due to a number of factors such as improved catch statistics, increased abundance due to stock enhancement and increased fishing effort. In spite of improved catch statistics the total catches declined towards the end of the 1960s. The river fishery is far more stable than the sea fisheries. A peak in the catch of the river fishery is observed in the mid 1970s.

### **2.12 Denmark**

The Gudenå Denmark's major river is supported a sizeable run of salmon at late as the early 20th century. At present the salmon are almost extinct in Denmark. However Danish seafisheries catch a substantial part of the salmon of the Baltic who stay for the sea-life stage in the southern Baltic Sea. Some of these fishes stay there for 3 or 4 winters, hence do not leave for the Atlantic (Netboy, 1980).

### **2.13 Poland**

Polands largest river the Vistula and the Oder and their tributaries all produced salmon. The Oder at present is now salmonless and the Vistula supports only small runs in one or two of its upper tributaries (Netboy, 1980, Lelek, 1987). But a recent statement by A. Witkowski of the Wroclaw University Museum of Natural History indicates that the salmon is now extinct in Poland (Witkowski, 1991).

### **2.14 Sweden**

Swedens remaining salmon rivers are in the central and northern part of the country. As Sweden used the hydropower of most of its rivers for making electricity most of its rivers became unsuitable for natural populations. However by large restocking programs and hatcheries Sweden compensates for the loss of natural salmon. In fact they are now supplying the whole Baltic area with products of the hatcheries. Hence it is difficult to give an estimate on the situation of the natural stocks of salmon. Escapees or released salmon from hatcheries will enter the remaining natural running rivers (Netboy, 1980).

### **2.15 Russia and Baltic states**

The two major Lithuanian rivers the Niemen and Venta as well as the Lathvian Daugava supported in the past many salmon. At present however the original stocks have been greatly reduced and in fact the Russian river the Dvina is one of few salmon rivers left in the Baltic precincts of Russia. Other Russian salmon rivers are Neva, the Salaca, Narva, Luga and Gauya (Netboy, 1980).

## **2.16 Finland**

Just as in Sweden many Finnish rivers were used for hydro-electric power and became lost for the salmon. The Kemi River was destroyed as a salmon river in the 40s and 50s. Also the Oulü River is now nearly lost for salmon as well as two great rivers in southern Finland, the Kymi and the Kokenaeki. In 1966 it was estimated that of the 47 Finnish rivers 15 rivers among them four large and six minimum size rivers lost their salmon and that the salmon stocks in the remaining 32 rivers were endangered due to damming of rivers, pollution, regulation of flow for drainage and flood control, drying up of swamps and bogs, timber floating, overfishing (Netboy, 1980).

## **3. CONCLUSIONS PER COUNTRY**

### **3.1 Portugal**

Average catch over the period (1920-1930) included is 2.49 ton/year.  
Average catch over the period (1950-1960) included is 0.73 ton/year. The average decrease is 1.76 ton or 71%.

### **3.2 Spain**

Based on the historical data salmon decreased from the 17th and 18th century till present. However the catch data before 1949 do not exist which makes it impossible to give a decline percentage from the mid twenties to the mid fifties. The total salmon catches in the period 1949-1985 averaged 5.224 salmon per year. According Camino (1940) who stated that in the decade 1920-1940 20.000 fish were caught annually, this would indicate a decrease of 75% which brings this estimate in line with Portugal.

### **3.3 France**

The average catch from the period 1920-1930 (76.4 tons) decreased to an average catch from the period 1950-1960 to 10.6 tons (catches in French estuaries). This is a decline of 86%.

### **3.4 Belgium**

In the period 1920-1930 on average 283 salmon were caught, in the period 1950-1960 none, hence a 100% decline and the species now extinct. Reintroduction is considered.

### **3.5 Netherlands**

Compared with the period 1880-1890 the salmon decreased in the period 1920-1930 with 82%. If we compare the period 1950-1957 with the period 1880-1890 the number of salmon caught decreased with 99.9%. If we compare the period 1920-1930 with the period 1950-1957 salmon went down with 99.4%.

### **3.6 Switzerland**

The salmon compared with the period 1892-1911 decreased in the period 1920-1930 with 80%. In the period 1950-1960 the salmon decreased compared with the period 1892-1911 with 99%. When comparing the period 1920-1930 with the period 1950-1960 a decrease of 94% is found. After 1957 no recordings of salmon catches could be traced.

### 3.7 Germany

Compared with the period 1870-1900 when on average 60,000 salmon were caught per year in the period 1920-1930 the number was 4,000. This is a decrease of 93%. And compared with the period 1940-1950 when 666 salmon were caught, on average the decline is 99%. When the 1940-1950 period is compared with 1920-1930 period salmon decreased with 83%. At present the species is now extinct. Reintroduction is considered, initial steps taken.

### 3.8 Scotland

If we compare the average catches in the period 1952-1960 (381,496 per year) with the period 1975-1984 (338,550 per year) then we observe a decrease of 11%.

### 3.9 Ireland

If we split the period 1975-1985 into two we observe that the catch between 1975-1981 (average 1,424 tonnes/year) decreases with 12% when compared with the period 1982-1987 (average 1,249 tonnes/year).

### 3.10 Iceland

When we compare the average yearly catch in numbers for the period 1950-1960 (2,055 salmon per year) with the period 1975-1986 (5,058 salmon per year) we observe an increase of 59%.

### 3.11 Norway

When we compare the average yearly catch in the period 1876-1885 (9167 tonnes) with the average yearly catch in the period 1920-1930 (183 tonnes) respectively with the average yearly catch in the period 1950-1960 (206 tonnes) and with the average yearly catch in the period 1975-1986 (327 tonnes) we observe a gradually increase of the river catches by 10% in the period 1920-1930, with 23% for the period 1950-1960 and with 69% for the period 1975-1986. However if we take as baseline the average yearly catch during the period 1920-1930 we note an increase in the catch for the period 1950-1960 respectively 1975-1986 with a percentage of 13% respectively 79%. In fact we observe nearly a doubling of the river catches of salmon in Norway during the last 100 years. It should be noted however that the production of farmed salmon increased rapidly from 1971 onwards from virtually no production to a production in 1986 of about 45,000 tonnes. If we assume that always reared fish will escape from hatcheries and that we assume that the escape % is about 2% due to various causes then this will result for the year 1986 in adding substantially salmon to the natural stocks.

For the Atlantic salmon of northern Europe, Norway and Iceland, if we compare the 1920-1930 with 1975-1986 we observe an increase of landed salmon of about 60%. For the salmon in the other European countries Portugal, Spain, France, Belgium, Netherlands, Germany, Switzerland when comparing the period 1920 with the period 1950-1960 we can see a decrease of about 85%, but it should be noted that at present the salmon in Belgium, the Netherlands and Germany is extinct. The salmon of the United Kingdom and Ireland show a decrease of about 10% for the period 1950-1960 compared with the period 1975-1985. For the situation in the Baltic it can be stated that the salmon stocks notwithstanding enhancement schemes are on the decline. That the salmon is lacking in the freshwater of Denmark, Baltic States, Poland and Germany bordering the Baltic.



## LITERATURE

Arrignon, J., J.P. Tane and M. Latreille, 1988. Exploitation of the resource in France. In: Atlantic salmon: Planning for the future. D. Mills and D. Piggins. Croomhelm London pp 209-608.

Camino, E.G., 1940. El salmôn, Fuente de Riqueza. Publs. Girec. de Turismo, Madrid 74 pp.

Garcia de Leaniz, C., T. Hawkins, D. Hay and J. Martinez, 1978. The Atlantic salmon in Spain. Atlantic Salmon Trust Pitlochry.

Garcia de Leaniz, C and J.J. Martinez, 1988. The Atlantic salmon in the rivers of Spain with particular reference to Cantabria. In: Atlantic salmon: planning for the future, D. Mills and D. Piggins. Croonhelm London pp 170-209.

Gardiner, R. and H. Egglshaw, 1986. A map of the distribution in Scottish rivers of the Atlantic salmon *Salmo salar* L. DAFS, Fresh Water Fisheries Laboratory, Pitlochry, 5 pp plus 1 folded map.

Groot S.J. de, 1989. Literature survey into the possibility of restocking the river Rhine and its tributaries with Atlantic salmon (*Salmo salar*). Publications and reports (Ecological Rehabilitation of the river Rhine) Report no. 11.

Groot, S.J. de, 1992. Decline and fall of the salmon fisheries in the Netherlands: is restocking the Rhine a reality? *Aquaculture and Fisheries Management* 23: 253-264.

Gudjonsson, T., 1988. Exploitation of Atlantic salmon in Iceland. In: Atlantic salmon: planning for the future, D. Mills and D. Piggins. Croomhelm London pp 162-177.

Hansen, L.P., 1988. Status of exploitation of Atlantic salmon in Norway. In: Atlantic salmon: planning for the future, D. Mills and D. Piggins. Croomhelm London pp 143-161.

Harris, G.S., 1988. The status of exploitation of salmon in England and Wales. In: Atlantic salmon: planning for the future, D. Mills and D. Piggins. Croomhelm London pp 179-209.

Hoek, P.P.C., 1916. Verslag van de Staatscommissie voor het zalmvraagstuk, deel 2: 173-238. Staatsuitgeverij 's Gravenhage.

Kühn, G., 1976. Die Fischerei am Oberrhein Geschichtliche Entwicklung und gegenwärtiger Stand, Hohenheimer Arbeiten, heft 83, Stuttgart, Verlag Eugen Ulmer 193 pp.

Lelek, A., 1987. Threatened fishes of Europe Vol. 9 of The Freshwater Fishes of Europe. AULA-Verlag Wiesbaden pp 97-100.

Mills, D., 1989. Ecology and management of Atlantic salmon. Chapman and Hall, London pp 351.

Netboy, A., 1974. The Salmon, their fight for survival. Andree Deutsch London 304 pp.

Phillippart, J.C., A. Gillnet, G. Rimbaudt, J.C. Micha and W. Delvingt, 1990. Le programme de reintroduction du saumon Atlantique *Salmo salar* L. dans le bassin Belge de la Meuse. In: C.-r Journée transfrontalière Environment UGET3, Merzig (Sarre, Allemagne 7 sept. 1989 publ. Février 1990 pp 20-35).

Shearer, W.M., 1988. Long term fluctuations in the timing and abundance of salmon catches in Scotland. ICES C.m. 1988/M:21 Anacat Fish Comm. 9 pp.

Staub, E., 1988. Passes à poissons des centrales électriques du Haut-Rhin. La migration, facteur de compensation? Bull. de l'OFPE (Bern) 4: 25-30.

Thibault, M., 1987. Éléments de la problématique du saumon Atlantique en France. In: M. Thibault and R. Billart (Ed. Restauration de rivière à soumons, INRA Paris, pp 413-425).

Thibault, M., 1991. Atlantic salmon annual catch statistics in France since the end of XIX century. ICES C.M. 1991/M:16 Anacat Comm.

Valente, A., P. Alexandrino, M. Thibault and E. Prevost, 1991. La population de saumon Atlantique *Salmo salar* (L. 1758) dus Fleuve Lima, Portugal: quelques observations préliminaires. ICES C.M. 1991/M:15 Anacat Comm.

Whitaker, T.K., 1988. Exploitation of salmon in Ireland. In: Atlantic salmon: planning for the future, D. Mills and D. Piggins. Croomhelm London pp 228-234.

Williamson R.W., 1988. Status of exploitation for Atlantic salmon in Scotland. In: Atlantic salmon: planning for the future, D. Mills and D. Piggins. Croomhelm London pp 91-116.

Witkowski, A., 1991. Threats and protection of fishes in Poland. Abstract in Proceedings (Abstracts). "The threatened world of fish", 7th Int. Ichth. Congr., The Hague 26-30 August 1991. p 95.

/MB