# NOTES ON THE CONTRIBUTION OF THE EUROPEAN SALMON PRODUCING COUNTRIES TO THE WEST GREENLAND SALMON FISHERY

Thór Gudjónsson

Reykjavík, 1992. VMST-R/92018.

VEIÐIMÁLASTOFNUN
INSTITUTE OF FRESHWATER FISHERIES
VAGNHÖFÐA 7 – 112 REYKJAVÍK – ICELAND

H1631 Gutenberg hf.

# NOTES ON THE CONTRIBUTION OF THE EUROPEAN SALMON PRODUCING COUNTRIES TO THE WEST GREENLAND SALMON FISHERY

Thór Gudjónsson

Reykjavík, 1992. VMST-R/92018.

# NOTES ON THE CONTRIBUTION OF THE EUROPEAN SALMON PRODUCING COUNTRIES TO THE WEST GREENLAND SALMON FISHERY

Thór Gudjónsson

## Introduction

The history of the Atlantic salmon fishery in Greenland waters has frequently been recorded, for instance recently by Möller Jensen (1988). The origin of the salmon in the fishery has been studied with the result that about 50% of the catch comes from the European countries and about 50% from the American side varying somewhat from year to year. Tag returns at West Greenland have shown that salmon from all the salmon producing countries in Europe have entered the fishery in varying amount with the exception of the Russia and Portugal. The main contributing countries are Canada and Scotland (Swain 1980, Möller Jensen 1988). The catch consists of multi-sea-winter salmon (MSW), mostly of salmon in their second year in the sea. Grilse do not enter the fishery. Salmon from individual salmon producing countries may feed in the open sea off West Greenland and in the Norwegian Sea, so that the same country may contribute to the fisheries at both feeding areas.

## Catches of MSW salmon in the countries of origin

It might be expected that the catches of MSW salmon in the countries of origin would give a clue to the contribution of individual countries to the West Greenland fishery. Table 1 shows that Norway catches 837 metric tonnes of MSW salmon on the average during 1981 to 1990, but only comparatively few tagged salmon from there have been caught at West Greenland. Scotland comes next in weight of catch with 451 tonnes on the

average from 1982 to 1990. The catches in Ireland in 1980 to 1989 and in Iceland in 1982 to 1989 were respectively 132 and 110 tonnes and the average catch in England and Wales during 1987 to 1990 is estimated close to 100 tonnes. The average catch for 1987 to 1989 in France was 13 tonnes and 35 tonnes in 1990 in Finland (Anon. 1991). When these figures are compared with data on the tag returns below, it is obvious that the amount of MSW salmon caught in individual countries of origin does not indicate the contribution of those countries to to West Greenland fishery, as demonstrated by the Norwegian example.

Recapture of salmon tagged as smolts in the countries of origin

Salmon smolts tagged in the countries of origin have been recaptured at West Greenland. Assessment of the contribution of each country to the Greenland salmon fishery has been based on the recovery rate from each country per 1000 smolts tagged in home countries. Swain (1980) studied the returns of tagged salmon caught at West Greenland from 1960 to 1971. Most often these figures were from 0.4 to 6,0 for wild salmon and between 0.1 to 1.9 for hatchery reared smolts. Swain states:"From the smolt tagging experiments carried out over a number of years there is every indication that the major European contribution to the Greenland fishery comes from Scotland, England and Wales from those rivers in which the normal runs contain a large proportion of two-sea-winter and three-sea-winter fish compared with the number of grilse".

Available material from the period 1972 to 1978 shows that England & Wales have the highest recapture rate of salmon with external tags at West Greenland based on tagged salmon caught per 1000 smolts tagged (1.33 from wild smolts and 0.14 for hatchery reared smolts). Scotland comes next (0.56 and 0.06) and Ireland is third (0.07 and 0.07). For Iceland the average figure is less than 0.01 for hatchery reared smolts for the years 1972-1977. During the five years period from 1972 to

1976 French salmon was caught in the fishery (0.01 and 0.01) and Swedish salmon also turned up (1972-1973 0.03 and 1972-1978 0.58) (Anon. 1980).

External fish tags have been used widely for tagging of Atlantic salmon smolts. In the 1970ies micro-tags came into use in Europe (in Iceland in 1974). In 1982 the ICES Working Group on North Atlantic Salmon made a special emphasis on the use of internal tags (micro-tags) for tagging salmon smolts and on scanning for them in adults in the fisheries (Anon. 1982). Return of such tags would furnish more reliable information than that of the external tags. The micro-tag is the most frequently used tag to-day for salmon smolts in Europe. Scanning for micro-tags was started at West Greenland in 1985. About 5% of the catch for that year was scanned or 14,319 fish. Thirty six micro-tags were recovered, two of these were lost and 31 were from Ireland. The average figures for the years 1986 to 1989 for recovered micro-tags per 1000 smolts tagged were for England & Wales 0.14, for Ireland 0.12, for Scotland 0.10 and for Iceland 0.01. These figures include both recapture of tagged wild smolts and of hatchery reared smolts. The survival of wild smolts to adult stage is about ten times greater than that of hatchery reared ones. The number of salmon scanned varied from 15,588 (1989) to 30,360 (1986). External tags were partly in use during the years 1986 to 1989 for smolt tagging along with micro-tags, except in Norway and West Sweden where external tags were used exclusively. In 1986 external tags from Northern Ireland, Scotland, Norway and Sweden were retrieved at West Greenland as well as 44 micro-tags from England and Wales, Scotland, Ireland and Iceland. (Anon. 1987, 1988, 1989, 1990).

Recapture of salmon tagged at West Greenland

Tagging of salmon feeding in West Greenland waters was carried out during the years 1965 to 1972 numbering 4,657 salmon, 2,364 of these being tagged in 1972 from 13 boats during a special international tagging program. Sixty six of these salmon were recaptured in the European countries as listed below:

| Tagging Years | Scotland | England & Wales | Ireland | France | Spain | Iceland |
|---|---|---|---|---|---|---|
| 1965-71 | 6 | 5 | 8 | - | 2 | - |
| 1972 | 24 | 9 | 8 | 2 | 1 | 1 |
| | 30 | 14 | 16 | 2 | 3 | 1 |
| | 45.5% | 21.2% | 24.2% | 3.0% | 4.6% | 1.5% |

(Möller Jensen 1980 and information from the author).

These figures show that about 90% of the salmon tagged at West Greenland were reported from the United Kingdom and Ireland. It is also noticeable that 7.6% of the tags are retrieved from countries south of there, i.e. France and Spain although the salmon production of these countries is small (see Table 1). The tag returns indicate that the European salmon producing countries situated south of 58.-59. northern latitude contribute most to the West Greenland fishery.

Recapture of tagged salmon at East Greenland

The salmon fishery in the coastal area of East Greenland is insignificant in magnitude and is in some years prevented by drifting polar ice. During the years 1965 to 1985 46 tagged salmon have been reported from the area, most of which have originated in the United States (28) and Canada (5). Only 12 of these have been tagged in the European countries. One tag each has been reported from Iceland and France, two each from Ireland and Scotland, and three each from Norway and Sweden (Anon. 1986, Anon. 1987).

Discussion

It is difficult to estimate accurately the contribution of European salmon producing countries to the Greenland salmon fishery. In this paper attempts are made to present three approaches for this purpose. Firstly to look for possible relationship between the quantitative catches of MSW salmon in each salmon producing country and its contribution to the West Greenland fishery. Norway has the largest catch but a small contribution to the fishery. Scotland has the second largest catch but is assumed to contribute most to the fishery

of the European countries (Swain 1980 and Möller Jensen 1988) (see Table 1). The countries producing close to 100 tonnes of MSW salmon each during the mentioned periods, such as England and Wales, Ireland and Iceland, contribute a varying amount of salmon to the fishery, Iceland only a small amount compared to the other two countries.

The second approach dealt with the recovery rate of salmon caught at West Greenland per 1000 smolts tagged in their home countries. This method of assessing the quantity of salmon from individual countries caught at West Greenland furnishes a certain indication of the contribution of each country although the method has limitations. Swain (1980) and Möller Jensen (1988) list several examples, two of which are given here. Quoting Swain: "There is some indication, however, that fish from one country or river may be more abundant in particular areas or certain times of the season than at others". Möller Jensen states: "Result from the tagging experiments is that not all river producing multi-sea-winter fish (MSW) contribute salmon to the same degree in the Greenland catch even if they are situated in the same area. Similarly, the contribution made by tributaries in the same river system may be different".

The results of tagging of salmon feeding at West Greenland seems to be the most reliable method of those applied in this paper although it has the snag that recovered tags may not be reported to the proper authorities. Failure to report tags may also possibly vary between countries. The tag return figures can thus be expected to be lower than actual recovery figures.

## Conclusions

Contribution of salmon from the European salmon producing countries to the West Greenland fishery comes, as previously indicated, mainly from the United Kingdom and Ireland, Scotland being the largest contributor. Salmon from France and Spain, as well as from West Sweden, enter relatively much into the fishery considering the size of their salmon stocks. Iceland contributes to the fishery on a small scale. Strayers from Norway and other countries of origin are caught occasionally. No tagged salmon from Russia and Portugal has been captured at West Greenland.

Table 1. Catches of multi-sea-winter salmon in the countries of origin based on catch records of ICES, CM 1991/Assess: 12

| Country | Years | No. of years | Average catch of MSW fish Tonnes | % | Total catch Tonnes |
|---|---|---|---|---|---|
| France | 1987-89 | 3 | 13.3 | 57.8 | 23 |
| Scotland | 1982-90 | 7 | 541.4 | 55.7 | 972 |
| England & Wales | 1987-90 | 4 | 24.564* | 27.3** | 323 |
| Ireland | 1980-89 | 10 | 131.6 | 10.4 | 1263 |
| Norway | 1981-90 | 10 | 836.8 | 61.5 | 1361 |
| Iceland | 1982-89 | 8 | 110.0 | 45,8 | 240 |
| Finland | 1990 | 1 | 35.0 | 59.3 | 59 |

* Number of MSW fish caught.

**Percentage of total number of fish caught.

References

Anon. 1980. Report of the Working Group on North Atlantic Salmon. Copenhagen, 30 April- 3 May 1979 and 15-18 April 1980. ICES, Doc. C.M. 1980/M 10.

Anon. 1982. Report of Meeting of the Working Group on North Atlantic Salmon. Copenhagen, 13-16 April 1982. ICES, Doc. C.M. 1982/Assess: 19.

Anon. 1986. Report of the Working Group on North Atlantic Salmon. Copenhagen, 17-26 March 1986. ICES, Doc. C.M. 1986/Assess: 17.

Anon. 1987. Report of the Working Group on North Atlantic Salmon. Copenhagen, 9-20 March 1987. ICES, Doc. C.M. 1987/Assess: 12.

Anon. 1988. ICES Compilation of Microtag, Finclip, and External Tag Releases in 1987. Doc. C.M. 1988/M: 7.

Anon. 1989. ICES Compilation of Microtag, Finclip, and External Tag Releases in 1988. Doc. C.M. 1989/M: 5.

Anon. 1990. ICES Compilation of Microtag, Finclip, and External Tag Releases in 1989. Doc. C.M. 1990/M: 4.

Anon. 1991. Report of the Working Group on North Atlantic Salmon. ICES, Doc. C.M. 1991/Assess: 12.

Möller Jensen, J. 1980. Recapture from International Tagging Experiment at West Greenland. ICES/ICNAF Joint Investigation on North Atlantic Salmon, Rapports et Procé-Verbaux des Réunions, Conseil International pour L Exploration de la Mer. 176:122-135.

Möller Jensen, J. 1988. Exploration and Migration of Salmon on the High Seas, in Relation to Greenland. Atlantic Salmon: Planning for the Future. Eds. Mills, D. and D. Piggins, 1988. 438-457.

Swain, A. 1980. Tagging of Salmon Smolts in European Rivers with Special Reference to Recapture off West Greenland in 1972 and Earlier Years. ICES/ICNAF Joint Investigation on North Atlantic Salmon. Rapports et Procé-Verbaux des Réunions, Conseil International pour L Exploration de la Mer. 176: 93-121.