



ATLANTIC SALMON TRUST

# SALMON FISHERIES IN SCOTLAND

ROBERT WILLIAMSON



November 1991

**J&B**  
**RARE**

Price £3.00

## PREVIOUS PUBLICATIONS IN THIS SERIES

Atlantic Salmon: Planning for the Future (Proceedings of the 3rd International Atlantic Salmon Symposium, Biarritz, 1986)	edited by D. Mills and D. Piggins	E  45.00
The Biology of the Sea Trout (Summary of a Symposium held at Plas Menai, 24-26 October, 1984)	by E.D. Le Cren	1.50
Salmon Stocks: A Genetic Perspective	by N.P. Wilkins	1.50
Report of a Workshop on Salmon Stock Enhancement	by E.D. Le Cren	1.50
Salmonid Enhancement in North America	by D.J. Solomon	2.00
Salmon in Iceland	by Thor Gudjonsson and Derek Mills	1.00
A Report on a Visit to the Faroes	by Derek Mills and Noel Smart	1.00
Problems and Solutions in the Management of Open Seas Fisheries for Atlantic Salmon	by Derek Mills	1.00
Scotland's King of Fish	by Derek Mills	1.85
Atlantic Salmon Facts	by Derek Mills and Gerald Hadoke	0.50
The Atlantic Salmon in Spain	by C.G. de Leaniz, Tony Hawkins, David Hay and J.J. Martinez	1.50
Salmon in Norway	by L. Hansen and G. Bielby	1.50
Water Quality for Salmon and Trout	by John Solbe	2.50
The Automatic Counter - A Tool for the Management of Salmon Fisheries (Report of a Workshop held at Montrose, 15-16 September, 1987)	by A. Holden	1.50
A Review of Irish Salmon and Salmon Fisheries	by K. Vickers	1.50
Water Schemes - Safeguarding of Fisheries (Report of Lancaster Workshop)	by J. Gregory	2.50

(continued on inside back cover)

**SALMON FISHERIES IN  
SCOTLAND**

by

**Robert Williamson**

*Inspector of Salmon and Freshwater  
Fisheries for Scotland*

---

**Atlantic Salmon Trust**  
Pitlochry, Perthshire

Published September 1991  
by the  
Atlantic Salmon Trust

printed in Scotland by  
Woods of Perth (Printers) Ltd  
Mill Street, Perth

ISBN 1 870875 11 7

Limited extracts may be taken from the  
text of this booklet provided that the source  
is acknowledged. If more extensive repro-  
duction is proposed, please write to  
The Atlantic Salmon Trust, Moulin  
Pitlochry PH16 5JQ

The cost of printing  
this booklet was sponsored by  
The Tay Salmon Fisheries  
Company Ltd

---

## PREFACE

Each salmon-fishing country manages its fisheries in its own different way. Some of the arrangements look strange when seen from across a border or over the sea; but they are of course not strange in their own place. It is therefore important, when discussing the merits of regulations used elsewhere, to understand the full background. I believe that the booklets published by the Atlantic Salmon Trust make a useful contribution to the dissemination of information of that sort. I was therefore especially glad to accept the Trust's invitation to write its "little blue book" on the Scottish salmon fisheries.

The booklet is about salmon fisheries rather than the fish itself. The biology of salmon, and important developments such as salmon farming, are subjects on their own and are here dealt with only incidentally to the fisheries.

I take this opportunity to acknowledge the help that I have had from the many people I have met and worked with in Scottish salmon fisheries during my time with the North of Scotland Hydro-Electric Board and at the Freshwater Fisheries Laboratory and now as Inspector of Salmon Fisheries. They have, without exception, been most generous with their help and in sharing their knowledge and ideas. I owe them much.

More specifically, in relation to this booklet, I thank Dr Peter Hutchinson who prepared the figures; Dr Derek Mills for permission to use his photographs; Miss Anne-Marie Meconi who typed the final text; and several colleagues and friends who read the manuscript and made helpful comments and corrections.

Any mistakes that remain are of course mine. Any expressions of opinion are also mine and do not necessarily reflect the view of the Scottish Office.

Robert Williamson  
Edinburgh

March 1991

**The Atlantic Salmon Trust** is a company, limited by guarantee and registered as a charity. Its main objective is to encourage and assist the conservation and enhancement of wild salmon and sea trout stocks in the United Kingdom. It draws attention to particular dangers facing those stocks; finances scientific research; arranges workshops and conferences; and publishes booklets on salmon and salmon fisheries for managers, scientists and fishermen. There is some further information about the Trust, and how you can support it, at page 42. A list of the titles of earlier booklets in this series is at the inside front cover.

**Robert Williamson** has been Inspector of Salmon and Freshwater Fisheries for Scotland since 1979. Before that he worked at the Freshwater Fisheries Laboratory of the Department of Agriculture and Fisheries for Scotland at Pitlochry. His first fisheries work was also on salmon, with the North of Scotland Hydro-Electric Board on the River Conon system in the late 1950's. From 1961 to 1970 he was in Africa, in Malawi, first as a Fishery Research Officer, later as the Chief Fisheries Officer.

## CONTENTS

Preface	iii
INTRODUCTION	
General remarks	1
The resource	2
ADMINISTRATION AND REGULATION	
Fishing rights	3
Administration of the fisheries	4
Border rivers and the Solway Firth	5
Regulation of the fisheries	7
THE FISHERIES	
Net fisheries	13
Angling	17
Nets v rods	19
Catch statistics	20
Interception fisheries	24
SOME ASPECTS OF MANAGEMENT	
Research	27
Hatcheries and stocking policies	28
Salmon ranching	29
Disease control	30
SOME MODERN DEVELOPMENTS	
Hydro-electric schemes	31
Impact of commercial salmon farming	33
Some other factors	33
CONCLUSION	35
Tailpiece	35
APPENDIX	
Notes	36
List of books and reports	<del>38</del>
Map of main salmon rivers	39
Table of annual close times	40
Information on the Atlantic Salmon Trust	42



***SALMO SALAR***

Well-named *salar* - a salmon clears a 3.5 metre  
waterfall on the River Orrin in Ross-shire

*(photo. Derek Mills)*



## INTRODUCTION

### GENERAL REMARKS

*"Today a salmon sports and leaps in my waters;  
tomorrow it will be off to take up a settled abode  
in the upper stream."*

Scotland is famous for salmon. And, in its own way, Scotland has been well forward in the management and regulation of its salmon fisheries, from the 12th century to the 20th. This account describes the present fishery and, where relevant, also looks back: it does not forecast the future.

It is convenient to make two general points straight away. First, although Scotland is part of the United Kingdom, its legal system is different from that of England and Wales; and the legislation on salmon fisheries is also different. In these respects the countries, though under one Crown and a single Parliament, are free, each from the other, and their salmon fisheries are separate - but, as we shall see, the salmon does not respect that! Secondly, in Scottish law, sea trout are treated the same as salmon (in some Acts the word "salmon" is even defined as including sea trout); but this booklet does not cover sea trout and, in it, salmon means salmon only - *Salmo salar*.

There is much interest in salmon in Scotland; many books have been written and several important Commissions and Committees have discussed and reported on the fisheries over the years. It is impossible to give a comprehensive summary of them in this booklet. For those who want more detail, a list of books and reports is provided at page 38. Some of the complaints and problems described in the old reports are still with us today; so too, fortunately, is the salmon.

The regulations and arrangements described in the following chapters are as at 1st January 1991. The superscript numbers in the text relate to the notes at page 36.

The chapter-head quotations are all from a prose translation of the delightful Latin poem, *Apologia Piscatoris*, by Arthur Johnstone.<sup>1</sup> Born in 1587 near Inverurie, Aberdeenshire, he studied medicine at Padua, practised for a time in France and was eventually physician to King Charles I.<sup>2</sup> The liveliness of the poem suggests that Johnstone himself had fished the River Don, by net and by rod, by fair means and foul; and it is clear from his descriptions that neither the habits of salmon nor the behaviour of man has changed much in the last 400 years.

### THE RESOURCE

*"Of their own free will the fish come ... what lunacy it would be to refuse such an offer of a dinner!"*

There are salmon in all Scottish river systems except some small streams that run direct to the sea. Distribution within each system may be limited by natural or artificial obstructions or, in a few cases, by pollution. A map showing the distribution is available from the Scottish Office Agriculture and Fisheries Department.<sup>3</sup> During the survey for that map, it was found that almost all streams over 10 m wide are free of natural obstructions but that impassable waterfalls are more common in the narrower streams. The remaining polluted waters of the central belt are gradually being cleaned up under the watchful eye and enforcing arm of the River Purification Boards; for example, salmon have recently returned to the River Clyde upstream of Glasgow after an absence of about 100 years.

The main Scottish watershed runs north-south, much of it close to the west coast; almost all the large rivers therefore flow to the east. In the larger systems, salmon may come in from the sea in every month of the year; but in the smaller rivers, and especially on the west coast, runs are usually in the summer and autumn only. The larger rivers are world-famous for salmon and salmon fishing - eg, the Tweed, the Tay, the Spey and the Dee. But many of the smaller rivers are also well known - eg, the Oykel, Helmsdale, Thurso and Naver, to mention some in the north.

The main Scottish salmon rivers are shown on the map at page 39. Some general information on salmon catches is given at page 20.

The general life history of salmon is well known and need not be repeated here; but one point is specially relevant to the recent management of the Scottish fisheries and is worth emphasis: a salmon returns to its native river to spawn. Each river therefore has its own, more or less isolated, stock: at sea that stock is mixed with the stocks of other rivers, on return to freshwater the stocks sort themselves out. Each of these stocks has its own production and mortality rate. ~~the fishery on each should therefore, so far as practicable, be~~ separately managed. That is appropriate even if there is no other difference between them, but there will sometimes also be significant differences in other characteristics (eg as a consequence of natural selection) and that too is relevant.

## ADMINISTRATION AND REGULATION

### FISHING RIGHTS

*"Here lies a man, owner of the neighbouring pool while he drew breath"*

The right to fish for salmon at any place in Scotland, whether in inland waters or the sea, is a heritable right, like ownership of land. Under the feudal system, the rights originally belonged to the Crown but, as with land, the Crown has made grants of salmon fishings to others. Ownership is therefore now widely distributed among companies and other businesses, clubs, syndicates and private individuals. The Crown Estate still owns extensive salmon fishing rights on the sea coast and in rivers; they are managed by the Crown Estate Commissioners and the majority are let.

The salmon fishing right can be bought, sold or leased independently of land, except that in Orkney and Shetland, which were ceded to Scotland by Norway in 1468, some relics of Norse udal law remain and salmon fishing rights in rivers and on the coast go with the adjacent land.

The right includes the exclusive right to fish for sea trout. It also includes the right to fish for brown trout and other freshwater fish but that right is shared with whoever owns the river bank. And it includes certain ancillary rights necessary for the full use of the salmon fishings; eg access over the land, rights to dry nets etc.

The private right of salmon fishing in the sea is unusual. It stems from the time when all the known ways of catching salmon in the sea involved some use of the coast: eg a beach seine or some form of fish trap on the shore. As recently as the late 1800's it was thought that the private right might not extend to catching salmon from boats in the open sea.<sup>4</sup> However, court cases in the 1960's established that it extends to the limit of the territorial sea<sup>5</sup> - now 12 miles seaward from the coastal base-lines. (But in practice, by regulation of methods, fishing is restricted to within a few hundred yards of the shore.)

These private and marketable rights are the basis of salmon fisheries management in Scotland and they have an important influence on the way the fisheries are regulated.

**ADMINISTRATION OF THE FISHERIES**

*"he is attending to the management of the universe,  
I am managing my own business"*

Each salmon fishery, whether in inland waters or the sea, is managed by its owner (and, if let, by the occupier) under a framework of regulations made by central government.

The country is divided into 101 salmon fishery districts, each the catchment area of a river or group of rivers (for list of districts see page 40). The owners of the salmon fisheries in a district may set up a District Salmon Fishery Board for the protection and development of their fisheries. These boards can appoint water bailiffs with powers to enforce the law; some also operate hatcheries for re-stocking the rivers and make other improvements. Each board is self-financing, and has a power to raise money by levying a fishery rate on the owners of salmon fisheries in its district. Most of Scotland is covered, but in some small districts the owners have not yet set up a board. Since 1989, fishery owners in a district where a board is established are not required to pay local government rates on their fisheries. There are some special arrangements for the administration of fisheries of the rivers on the border.

The Secretary of State for Scotland oversees the fishery as a whole. He promotes legislation in Parliament and makes regulations under the various salmon and fisheries Acts. In this he is supported by the Scottish Office Agriculture and Fisheries Department. The Inspector of Salmon and Freshwater Fisheries advises it on the operation of the fisheries and the effect of the legislation; its Freshwater Fisheries Laboratory provides scientific advice on salmon and salmon fisheries; and its Fisheries Protection Service enforces the regulations at sea and helps district boards in local enforcement along the coast.

The Council and Commission of the European Communities regulates the fisheries beyond the 12-mile limit; and, within that limit, the national legislation must be compatible with Community law, must be notified to the Commission, and may be subject to its approval.

**BORDER RIVERS AND THE SOLWAY FIRTH**

*"There is no less delight in playing a trick on the owners of the next fishings - fooling them properly, and snatching their feast from them before they can get it."*

Much of the border between Scotland and England follows the line of rivers, and on the west coast it lies in the Solway Firth. The Scottish salmon conservation laws were often disapplied to these areas, especially when the countries were at war. For example, a close time applied in Scotland in 1429 except in the waters of Solway and Tweed which - *"shall be ready to all Scottish men, all times of the year, as long as Berwick and Roxburgh are in Englishmen's hands"*.<sup>6</sup>

Several later Acts contained similar provisions and the reason was clearly explained in a Scottish Act of 1606 (after James VI of Scotland had become also the King of England): *"the rivers Annan and Tweed were then exempted because the said rivers at that time divided at many parts the bounds of Scotland and England adjacent to them, whereby the forebearance upon the Scots part of the slaughter of salmon in forbidden time, and of kipper smolts and black fish at all times, would not have made the salmon any more to abound in these waters, if the like order had not been observed upon the English side"*.

It went on: *"Which impediment being now removed by the most happy uniting of both the kingdoms ..."*.<sup>7</sup>

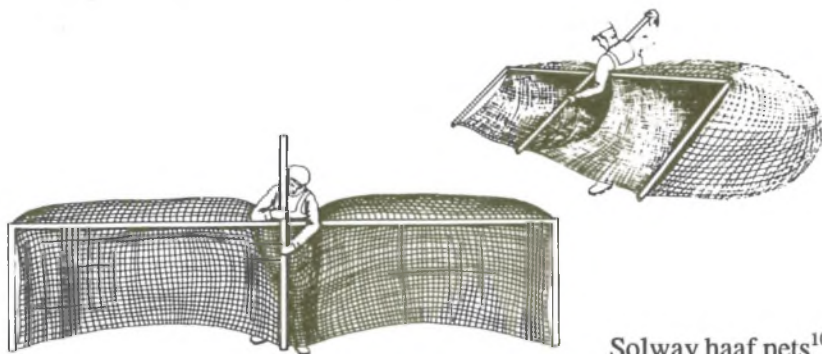
The optimism of those early legislators has not been fully realised - differences across the border are still a source of difficulty - but, following the Parliamentary union of 1707, the border rivers have gradually been specially provided for.

**The River Tweed** rises in Scotland but, in its lower reaches, forms the border for a few miles before crossing entirely into England. There has been special legislation for this river since 1771. Local administration is by the River Tweed Commissioners under the Tweed Fisheries Acts 1857-1969. The Commissioners have powers similar to those of a District Salmon Fishery Board. The whole of the river, its tributaries and an area of sea at its mouth, are treated for most salmon fishery purposes as if they were in Scotland.

**The River Esk** also rises in Scotland but crosses into England and for part of its course is the border between the countries - it is therefore sometimes called the Border Esk to distinguish it from other Esks. This Esk, including all its tributaries in Scotland, was made subject to the English salmon fisheries legislation in 1865 and that position has been maintained ever since.<sup>8</sup>

**The Solway Firth** is a wide but shallow estuary which separates south-west Scotland from north-west England. Its fisheries were specially provided for in 1804 under an Act which applied equally to the whole of the Solway and all its inflowing rivers, whether English or Scottish. However, since 1861, a series of separate English and Scottish enactments has largely superseded the Solway Act and different laws now apply on each side of the border.

As a result of the disapplication of Scottish salmon fisheries legislation to the Solway in the 15th and 16th centuries, fishermen continued to use fixed nets and traps which were not permitted in similar situations elsewhere in Scotland. This anomaly was not dealt with until 1877 by which time it was considered that the use of some of the nets was a lawfully established right. Commissioners were appointed to investigate.<sup>9</sup> They disallowed many of the claimed rights; those that they allowed were given certificates describing the exact dimensions and position of the net. These are now the only lawful fixed nets in the Solway and are known as the certificated fixed engines.



Solway haaf nets<sup>10</sup>

Another unusual feature of the Solway is the use of haaf nets. A haaf net is a bag-shaped net which is held against the flow of the tide until a salmon enters it. The netsman then lifts his net to trap the fish within the bag of netting. The nets may be used singly or several together in line abreast. Although the method has been in use for a very long time, it is not clear whether it is a lawful method in the Scottish waters of the Solway.<sup>11</sup>

**REGULATION OF THE FISHERIES**

*"There is a penalty attached to this law,  
and it is necessary to obey"*

The course of salmon fisheries legislation has necessarily been one of interference with fishing rights. Originally anyone could catch salmon as best he could; and, at common law, the only restriction is that the right should not be exercised *in aemulationem vicini* which means, roughly, in a spirit of spite. But with the development of more efficient methods and equipment it became necessary, in the public interest, to impose restrictions for the preservation of the stocks of fish.<sup>12</sup>

The earliest Scottish salmon fisheries law of which records survive, dates from the end of the 12th century and was a measure to establish a weekly close-time and also, by specifying a mid-stream gap, to prevent total obstruction of a river by fishing weirs.<sup>13</sup> These provisions, and those of later Acts, suggest that even the earliest legislation was based on a good understanding of the life history of salmon. There are, for example, Acts of 1318 and 1457 which protected smolts:

*"that no man in smolt time set vessels, creels, weirs or any other engine to let [ie hinder] the smolts to pass to the sea under the pain of ten pounds to the King"*<sup>14</sup>

The principles embodied in the old Acts were summarised in an important salmon case in 1863:<sup>15</sup>

- to ensure that salmon have free access to the upper freshwaters, which are their natural spawning grounds;
- to secure the unimpeded return of smolts to sea; and
- to prohibit the killing of fish when they are out of season (ie at and about spawning time).

These principles gave rise to differences between what is allowed in rivers and on the sea coast. It was thought that nets in the sea would not prevent access of salmon to their spawning grounds, so fixed nets were allowed; but ~~the use of fixed nets in rivers was prohibited.~~

The early legislation was not directed at regulating the mutual rights of the various proprietors on the river and the coast; but some more recent measures have had that intention and effect.<sup>16</sup>

As already described at page 3, salmon fisheries are privately owned; so it is necessary to have permission from the owner before starting to fish. There is however no licensing system and no need to obtain a permit from a Government Department or from the local District Board. (For the Border Esk, which is subject to the English Acts, a licence may be required from the National Rivers Authority of England and Wales.)



Salmon stake nets in the Esk District. The head and cleek poles of bag nets can be seen just beyond them.



For inland waters, the lawful fishing methods are directly listed in the legislation but for the sea it is the other way round, any method is allowed unless it has been prohibited. There is a provision that would put some of the sea fishing regulations on the same basis as those for inland waters - but it is not yet in force.<sup>17</sup>

**In inland waters**, the only generally lawful fishing methods are rod-and-line and net-and-coble. For this purpose inland waters include rivers and estuaries and, to avoid uncertainty, boundaries have been set dividing each major estuary from the sea.<sup>19</sup> On some rivers there are ancient fishing weirs, called cruives, but none is now used. Some fixed nets are permitted in the Solway Firth on the border with England (see page 6).

*Rod and line* is defined as a single rod and line with any bait or lure that was lawful in 1951 and has not been prohibited by regulations since then. For example, it is not lawful to use any fish roe in salmon fishing, nor to use lights (both prohibited last century); and, for some rivers, regulations made under the 1986 Salmon Act forbid the use of natural shrimp or prawn as a bait. The owner of a fishery may impose his own, more stringent, rules about what baits or lures may be used - and many do.

*Net and coble* is a restricted form of beach-seining: the fish are surrounded by a net and drawn to the bank or shore. The net and any warps must be shot and hauled as quickly as practicable and be kept in unchecked motion by the fisherman; the net must not be held stationary or left to drift or be used to enmesh the fish or to obstruct them. The courts have been assiduous in preventing developments that involved any fixed or stationary fishing devices in inland waters - even quite small croys or dykes, used in conjunction with a beach seine, have been declared unlawful.<sup>19</sup>

**In the sea**, it is prohibited to use drift-nets or other gill nets, trawls, seine nets (other than beach seines), troll or long-line for catching salmon. The use of poisons, explosives and electro-fishing devices is also banned. The effect of all these prohibitions is that the practicable and lawful methods of salmon fishing in the sea are rod and line, beach seine (net and coble), stake net and bag net.

A salmon *stake net* is set on a shelving beach and consists of a "leader", made of netting and set out more or less at right angles to the shore. It leads the salmon to a trap also made of netting and held up by stakes set in the sand. The leader may be held rigid on stakes (a fly net) or may be unstaked but mounted to a float line so that it rises up into its fishing position with the tide (a jumper net). The fish are taken from the trap with a dip net at low tide.

A *bag net* is similar in shape to a stake-net but is used in deeper water, often off rocky coasts. It floats from the surface of the sea and is held in place by anchors (see diagram on page 14). The net is fished from a boat at slack tide. Several stake nets or bag nets, or combinations of both, may be set in line out to sea.

**Annual close time** There is a minimum annual close time of 168 days. The dates are set by the Secretary of State and vary from district to district - most are from late August to mid February. Angling is allowed to continue for a few weeks after the beginning of the close time and, in some districts, may start before it ends. The dates for the close times can be changed by the Secretary of State on application from a district board. For the Tweed, the annual close time for nets is 153 days; and angling is allowed in all months except December and January. A full list of the current close times is given at page 40.

**Weekly close times** For angling, the weekly close time is 24 hours (Sunday); for all other forms of salmon fishing it is 60 hours (6.00 pm on Friday to 6.00 am on the following Monday). This is backed up by regulations on the way that the fixed sea nets must be put out of operation during the weekly close period.

**Protection of juvenile and breeding fish** There is a prohibition on taking juvenile salmon (fry, smolts etc) or gravid fish or kelts. These prohibitions are backed up by regulations against the possession of any such fish or of salmon roe. There are special exemptions from these, and other, regulations to allow scientific investigation, fish farming and the artificial propagation of salmon. There is a minimum mesh size for salmon nets (one and three quarter inches (45 mm) knot-to-knot on each side of the mesh) to ensure that salmon smolts are not obstructed or enmeshed.

**Control of fishing effort** To many people, the most surprising thing about the management of salmon fishing in Scotland is that there is no obvious control of the amount of fishing effort. There is no licensing of fishermen or fishing gear and no direct restrictions on the quantity of gear used or on the amount of fish taken. But, despite all that, the salmon stocks have not been fished-out.

In fact there is regulation of effort but it is indirect, a consequence of the private ownership of the fisheries and controls on the methods allowed. The use of methods that might lead to over-exploitation of the stocks has been made unlawful: either by the law courts, which maintain a restrictive

definition of the netting method that can be used in rivers and estuaries, or by further statutory regulation such as the prohibition on the use of drift-nets or other gill nets in the sea.

A salmon fisherman, because of his ownership or tenancy, has the exclusive right to fish for salmon in the area of his fishery; so he can decide on the amount of his fishing effort without fear of competition from others in that area. At each site, a net will tend to catch fish in proportion to the abundance of stock in the area of the fishery during the period fished. But the lawful gear is relatively expensive to maintain and use, so there is an economic force which leads to a decrease in effort at times when salmon are less abundant and an increase when they are plentiful.

Because the salmon fisheries are saleable, salmon netmen or companies can acquire fishing rights over a sufficiently large area to operate efficiently. For example, various salmon net fisheries in the lower River Tay were brought under single management at the turn of the century; this resulted in a decrease in total fishing effort but, according to contemporary accounts, an increase in the value of the net fisheries and of the upstream rod fisheries. Indeed a large part of the support for the Tay Salmon Fisheries Company came - and some still comes - from upstream proprietors (as the records of share holdings in the company show). Similarly, the rod-fishing interests on the River Dee bought the upper river nets between 1870 and 1910, operated them for a time to meet the cost, and then closed them down.<sup>20</sup>

There have been many other arrangements whereby netmen have been bought-out or compensated by anglers or other netmen who saw an advantage in reducing fishing effort at particular sites. Some changes have been in the opposite direction, as when the company on the Tay relinquished leases on some unfished stations which were then taken up by another company. Recently, a trust (the Atlantic Salmon Conservation Trust (Scotland)) has been set up with the main aim of buying-out coastal salmon fishing rights as a contribution towards implementing the principle of managing stocks on a river-by-river basis. (This Trust should not be confused with the more concisely named Atlantic Salmon Trust, publishers of this booklet.)

The system of freely marketable rights, coupled with strict limits on methods and gear, has worked well over many centuries and still has several advantages in a fishery where the abundance of the stock may vary widely and unpredictably. Interestingly, some modern fisheries economists have suggested a similar arrangement (described as "marketable usufructuary rights") as a possible solution to management problems in some public sea fisheries.<sup>21</sup>



**A long cast on the River Tay**

*[Photograph by E. Johnson]*



**Net and coble fishing**

*[Photograph by Susan Williamson]*

## THE FISHERIES

### NET FISHERIES

*"Minister, why do you direct your artillery  
against my nets?"*

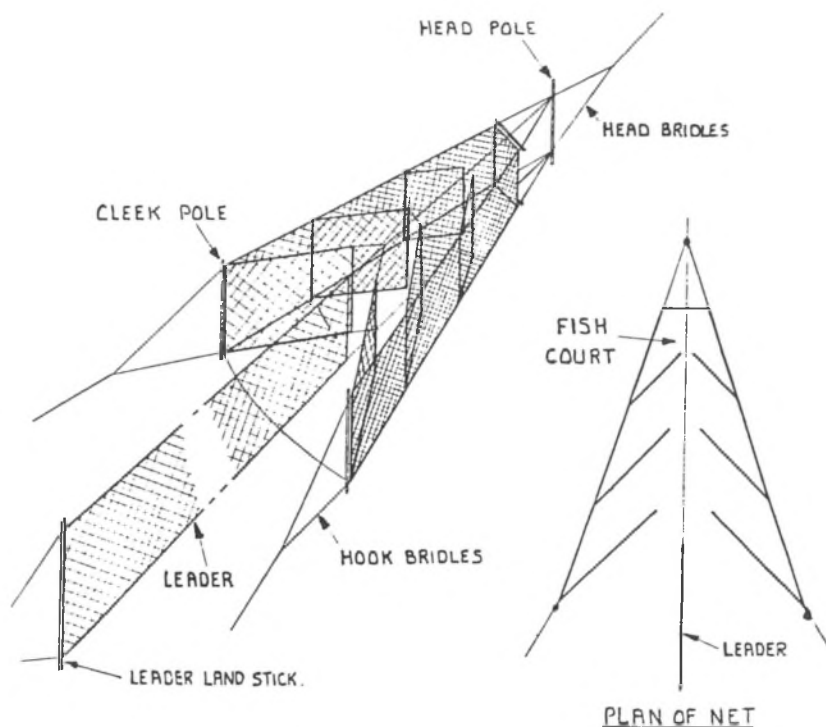
Until quite recently there were net fisheries in all of the main salmon fishing rivers of Scotland. These fisheries operated for many centuries and the method used, beach seine, was unchanged over the years. There were of course changes in material - synthetic twine is now used in place of natural fibres and the boats are now sometimes powered by engines rather than oars - but the basic operation is the same as that illustrated on maps of the 1600s and in use long before that.

The lawful mode of operation of these nets is described briefly under "Regulations" at page 9: it is usually called fishing by net and coble. A net and a coble (small boat) were the symbols by which a title to salmon fishing was usually conveyed from one owner to another and the words have become fixed in the vocabulary as the name for what is allowed, under common and statute law, as the fair and lawful method of net fishing in inland waters.<sup>19</sup>

Beach seines can also be used on the sea coast, and at some places they are, but the more usual methods are stake nets (set on shelving beaches) or bag nets (set in deeper water, often off rocky shores). These nets are sometimes referred to as the "fixed engines" (engine in its otherwise obsolete meaning: "device"), but the term is not restricted to stake nets and bag nets (though it is often used as if it were) - a gill net too is a fixed engine.

The stake net is derived from earlier stone and wattle fish traps used in estuaries and sheltered bays. It has an ancient history but there was a significant development in 1797 when a family from Dumfries-shire leased a fishery in the Tay estuary and experimented with stake nets, successfully adapting a type used in the Solway. After much debate, the method was declared unlawful in the Tay (being a fixed device in a river) but by about 1820 it was found that the new design worked well on beaches on the open coast. In the next few years, the forerunners of the present-day stake nets spread up the east coast.

The bag net was developed by John Hector who introduced it in 1827 at a fishery near Aberdeen. It is a floating net but otherwise operates on the same principles as the stake net. It proved so productive that, four years later, when his lease came up for renewal, he renewed at £660 per annum where previously the rent was only £20.<sup>22</sup> The method was soon adopted elsewhere around the coast and the basic design has hardly changed since then.



Diagrams of a bag net  
(after Hector<sup>23</sup>)

Many bag nets are now double-headed, having two trapping chambers set opposite each other at the seaward end of the leader.

The lawful netting season runs from February or March through to August or September (see page 10) but, because spring salmon have become less abundant, few nets are now operated at the beginning of the season and many do not start fishing until May when the run of fish starts to increase.

There has also been a decrease in the amount of salmon netting generally: the sale price of the fish has decreased (as a result of fish farming) and the cost of labour has increased. Many less favoured, or less efficient, netting stations have therefore been given up. In addition, the Atlantic Salmon Conservation Trust (Scotland) has purchased the salmon netting rights on parts of the coast, especially in the Moray Firth, for the purpose of *not* fishing them. This is intended as a further step towards realisation of the principle

that exploitation of salmon should be on a river-by-river basis and is best achieved by fishing only the river and its estuary.<sup>24</sup> The Trust has also bought salmon fishing rights in some rivers and estuaries. One of the results is that there is now no salmon netting on the Rivers Dee and Don, rivers which were, for centuries, "most famous for the taking of salmon".<sup>25</sup>

As already discussed at page 10, the amount of netting is not directly limited by regulation but, because of control on methods and sites of fishing, it varies according to the abundance of returning salmon and the economics of operation. There are also social pressures that prevent netting at up-river sites.

The most important remaining net-and-coble fisheries are in the big rivers of the east coast: the Tay, Tweed, Spey and North Esk. Net and coble is also still used on smaller rivers such as the Thurso and Naver, but sometimes for only part of the season. In some rivers, the net may be used for only a few days each year.

Bag nets and stake nets are not suitable for such occasional use and, once set, are usually operated for several weeks or months. On the east coast there are very few bag or stake nets south of the Esk District. The most important regions for these nets are now the North-east, the Moray Firth (much reduced recently), the North and the Solway Firth.

**Prohibition of fishing in the open sea** The developments of gill nets made from synthetic twines in the 1950's made drift netting for salmon much easier and, in 1959, some fishermen in the north-east of England started using their drift nets further offshore. In 1960, some of these fishermen came north, over the border, and fished for salmon with drift nets off the adjacent Scottish coast. Local fishermen soon copied them and, over the next two years, this drift-net fishery increased and spread northwards as far as the Moray Firth. In 1962, it was estimated that about 115,000 drift-net-caught salmon were landed in Scotland and that at least 139 fishing boats had been involved.<sup>26</sup>

In 1961, the Government appointed a committee, under the chairmanship of Lord Hunter, to review the salmon and trout fishing law of Scotland. In view of the threat posed by the drift netting, the Hunter Committee was asked to report on that first. Meantime, the Government announced that it would prohibit drift netting for salmon in Scotland when the power to do so became available under an Act which was about to be passed by Parliament. That was duly done - the ban took effect at the end of the 1962 season.

The table below gives the number of salmon landed in Scotland from the drift-net fishery and shows its increase and spread along the east coast until banned in 1962:

Area	1960	1961	1962
Tweed	9,000	14,000	30,000
Arbroath/Montrose	-	12,000	37,000
Aberdeen/Stonehaven	-	-	25,000
Peterhead/Fraserburgh	-	2,000	18,000
Moray Firth	-	-	5,000
Total	9,000	28,000	115,000

The Hunter Committee reported in 1963 and 1965. It recommended that the prohibition on drift netting should continue because, among other things, such a fishery would frustrate or prevent the scientific management of individual salmon rivers. It also came to the more general conclusion that salmon fishing in the sea was incompatible with proper fisheries management and that the commercial take should be by a concentrated net fishery, or a trap, at a single point on each river. This is sometimes in Scotland called the "Hunter principle" (though the Committee came up with more than one principle). It is a restricted case of the "headland principle" (fishing only allowed inside the headlands on the coast adjacent to the mouth of the river).

Scotland was the first major salmon-fishing country to prohibit the use of drift nets. It was done on a properly argued scientific basis *before* any damage was obvious in the fishery - a far-sighted decision and fortunate for the well-being of Scottish salmon stocks and fisheries.

In 1971, the ban on the use of drift nets for salmon fishing was extended to cover trawls, long-lines and the like and, in 1975, to other gill nets set at sea. An additional measure prohibited the use of shore-set gill nets from 1986.

Also in 1986, to help in the enforcement of the ban on fishing for salmon with drift nets, it was made an offence to carry any monofilament gill net on board a British fishing boat in Scottish inshore waters.



**ANGLING**

*"When the nets are idle, we hunt the fish with rods ...  
If bait is not to be got (for who can find bait  
enough for so many thousands?) the hooks are usually  
hidden in a many-coloured little feather"*

Our chapter-head poet confirms that fly-fishing for salmon was already well known in Scotland in the early 1600's; and, given his "so many thousands", he might even have caught more than Mr Naylor's record - 54 salmon to his own rod from the Grimersta in Lewis on 28th August 1888.<sup>27</sup>

Today recreational salmon angling is a significant business in Scotland, worth many million pounds annually, and critical to the economy of some rural areas. Some of the fishing is exclusive and very expensive: some is more accessible and relatively cheap. A length of river or bank, let or fished as a unit, is usually referred to as a "beat". A week on a top beat for one rod might cost £1,000 or more: but a day on a pleasant and sometimes productive beat on a minor river could be as little as £10. In some areas, angling clubs have stretches for which visitors may buy a permit at a very reasonable price; and some towns and villages, situated on salmon rivers, own the rights to the fishings in the town and make it available to residents and visitors. Details of available fishings are given in angling guide-books (see list at page 38).

In the 19th and early 20th centuries, most of the better beats on the large rivers were kept in-hand or let on long leases and fished by the owner or tenant and his guests or friends; some were let on a monthly basis. Now most of these fisheries are let in some way, often by the week or even a shorter period.

One much-described feature of salmon fishing in Scotland is the gillie (or ghillie) - the salmon angler's attendant - whose advice, assistance and company could make or mar the fisherman's day. There are fewer gillies these days, and on those beats where gillies are used, each may serve more than one angler. If the gillie has a good knowledge of the water being fished his advice can be invaluable to the visiting angler. Wistfully described as a "dying breed", they are still lively enough on some rivers (it is the caricature that is dying, the style that is changing). On the River Tweed, always different, the description is "boatman" not "gillie" (and on the lower Tay too).

A relatively new way of distributing angling rights is by "time-share". This concept has developed from the time-sharing of holiday chalets. In some schemes, the title to the salmon fishery is vested in a holding trustee and the individual time-sharer has a certificate which gives him a right to fish a particular beat (or group of beats) on a specified week each year. In others, the title is divided, each time-sharer owning a small fraction of the whole fishery as well as having a certificate entitling him to fish all of it during the

week he has purchased. The "weeks" may be sold outright, in perpetuity, or for fixed periods of, for example, 99 or 30 years. In addition to the purchase price, the time-sharer pays an annual charge towards the cost of managing the fishery as a whole.

It is a new arrangement and there are some uncertainties. There is a fixed number of weeks in a year, so the time-sharer of a holiday home knows where he is. The length of the salmon fishing season can however be reduced at either end. What then is the position of the "owner" of a week that has been deleted from the season? And are certificates which purport to give an exclusive right to fish a particular week in perpetuity really heritable in the same way as a title to, say, one thirtieth of the whole fishings? Time, no doubt, will tell.

The capital value of good salmon fishings has increased more than 10-fold in the last 10 years and is now very high. Fishings have been sold for as much as £15,000 for each fish in the average annual catch (10-year average). Few men have the millions it takes to buy a productive beat: a far greater number are able to pay much less in absolute terms, but more proportionally, for a small part of it. That is what drives the development of time-share salmon fishing in Scotland at present. As a consequence, while it has made some fishings more accessible to some fishermen, it has contributed to the great increase in the capital value of reliable fisheries and, in some cases, has reduced the amount of local access. It is an interesting development - and perhaps too early yet to assess its full effect.

The type of baits or lures used in angling varies from river to river and, in many rivers, from beat to beat within it; mainly at the discretion of the owner, sometimes strongly constrained by local custom. In the rivers of the north, from the Dionard round to the Kyle of Sutherland, fly-only is the rule. The same is true of much of the River Dee and also in parts of many others, though sometimes only for part of the season. In the Tweed, fly-fishing is the only lawful method after 15th September each year. A landing net, gaff or tailer may be used to help in landing rod-caught fish. Gaffs are discouraged at some places and are prohibited by law on the Tweed after 15 September.

The recent development of catch-and-release in North America and France has attracted attention in Scotland but, as yet, few full-scale converts. That the fish is edible - and eaten - was originally the basis of salmon angling, and is still a significant element. If the salmon stock in a river cannot stand a particular level of cropping then, it can be argued, it is better to reduce the fishing intensity (whether by rods or nets) rather than that the fish be gratuitously hooked, played and then, graciously, released.

### NETS v RODS

There is much controversy and discussion in Scotland, as in other countries, about the effect of local net fisheries on angling. (Indiscriminate netting at sea is covered in a later section.) Clearly, if there is a lot of netting then angling may suffer - and in some places and at some times it has. But if, in the larger Scottish rivers, there is not enough salmon to allow both an economically viable net fishery *and* good angling, then there is almost certainly something more seriously wrong with the salmon stock of the river than just the operation of the local nets.

Many of the most vociferous opponents of local river and coastal nets are visiting anglers. Nothing said here is likely to change their minds nor those of the many others who see such netting as the main evil facing salmon stocks. (And it is not reasonable to expect them to change their minds: they have a different view of fish and fishing.) Equally, the local netsmen know that their operations do not destroy the stocks - indeed on some rivers netsmen have taken a more active part in the conservative management of salmon stocks than the anglers.

The controversy will continue, perennial as the grass, so long as there are anglers and netsmen. The nets are usually at the receiving end, so, for a change, I illustrate the subject with a picture from an open letter of 1885 in defence of stake nets (the waterfall shown here is now equipped with an efficient fish pass).<sup>28</sup>

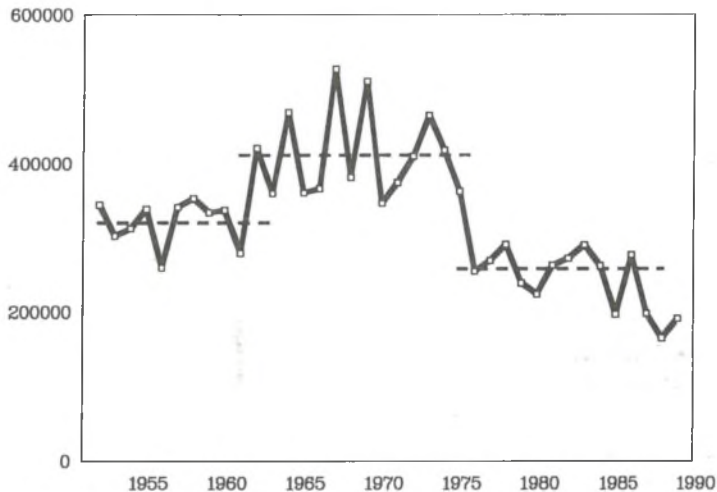


THE PRIVILEGED FIXED ENGINES OF UPPER PROPRIETORS.

### CATCH STATISTICS

*"It is a foolish superstition to muffle the mind in numbers - arithmetic of this sort has a bit too much of the magic art in it"*

The Scottish Office Agriculture and Fisheries Department collects statistics of salmon caught by netmen and anglers. Summaries are now published annually and there is also a compendium for the years 1952 to 1981.<sup>29</sup> The statistics for the total net catch show no single trend over the 38 years of the series, see Figure 1 below.



*Figure 1* Numbers of salmon reported caught by nets (net-and-coble and fixed engine) in Scotland 1952-1989: does not include landings from the brief drift-net fishery in 1960-1962, for which see page 16.

The catch record can, most simply, be split into four parts: the years 1952-61 when the catch averaged a little over 300,000 fish; 1962-75 when it was about 400,000; 1976-86 just over 250,000; and the three years, 1987-89, all less than 200,000. Clearly the catch in 1962-75 was significantly higher than either before or since. The step-up and step-down are quite sudden and not readily explained by changes in fishing effort at home or abroad.

The catch in the last 14 years of the series is less than in the first 10. However, Figure 1 only shows the catch in Scotland: it must be remembered that, compared with the 1950s, Scottish-origin fish are now caught in greater

numbers in interception fisheries elsewhere. Information on the catch in those fisheries suggests that the total catch of "Scottish" salmon was as great from 1976 to 1986 as it was in the 1950s. The catch taken in the last three years of the series was significantly affected by sharp reductions in Scottish net-fishing effort.

The annual catch by rod and line has not varied as much as the net catch. It has been above the long-term average for most of the last 12 years, see Figure 2; angling effort has also changed over the period. As with the nets, the number of salmon caught at the beginning of the season, "spring salmon", has declined - see Figure 3 below. The fall in the number of spring salmon taken

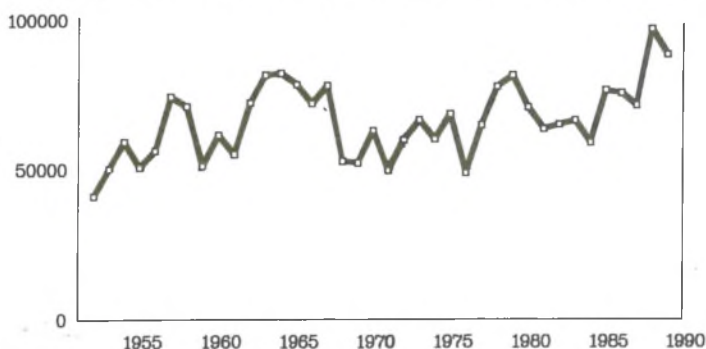


Figure 2 Numbers of salmon reported caught by rod and line in Scotland 1952 to 1989

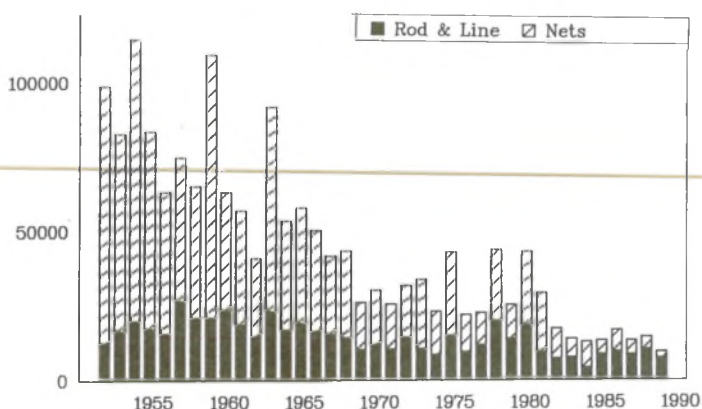


Figure 3 Number of salmon reported caught in the spring (January to April inclusive) in Scotland 1952 to 1989

by net is steeper than the decline in the number taken by rod. That is a result of the concomitant decrease in net-fishing effort in spring, an example of the self-regulating effect described at page 10. Fish that return after only one winter in the sea are a significant part of the catch in most rivers. From 1962 to about 1976, the catch of these fish, the grilse, was large - see Figure 4 below. Fishermen, when reporting their catches, usually distinguish between grilse and longer-absent salmon on the basis of weight; the larger grilse are therefore often reported as salmon. The average weight of grilse was relatively high during the period when they were abundant, so more than usual will have been mis-reported as "salmon". The real increase in grilse in the period 1962 to 1975 was therefore more marked than Figure 4 suggests.

Beware the confusing nomenclature! When discussing grilse, the meaning of "salmon" is often restricted to mean the longer-absent fish only. In this booklet, "salmon" includes grilse except where grilse are being directly contrasted with the longer-absent fish.

It is not possible in a booklet of this size to do more than give an outline of the overall catches. It should however be noted that there are significant differences between regions. Some of these are illustrated opposite. They emphasise the need for separate consideration of the stocks and fisheries in different regions and districts.

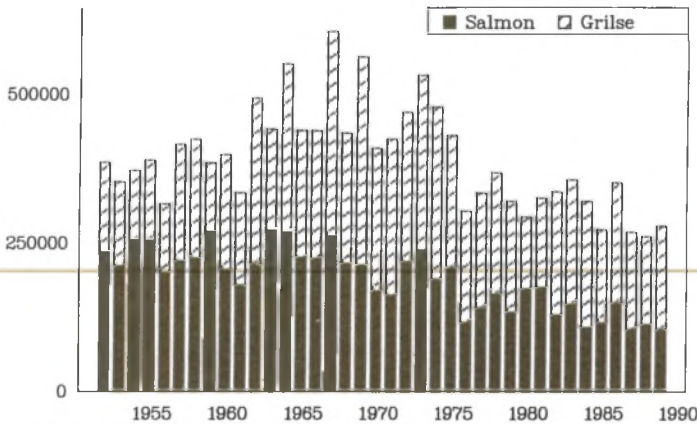


Figure 4 Number of grilse and salmon caught by all methods (nets and rods) in Scotland 1952 to 1989

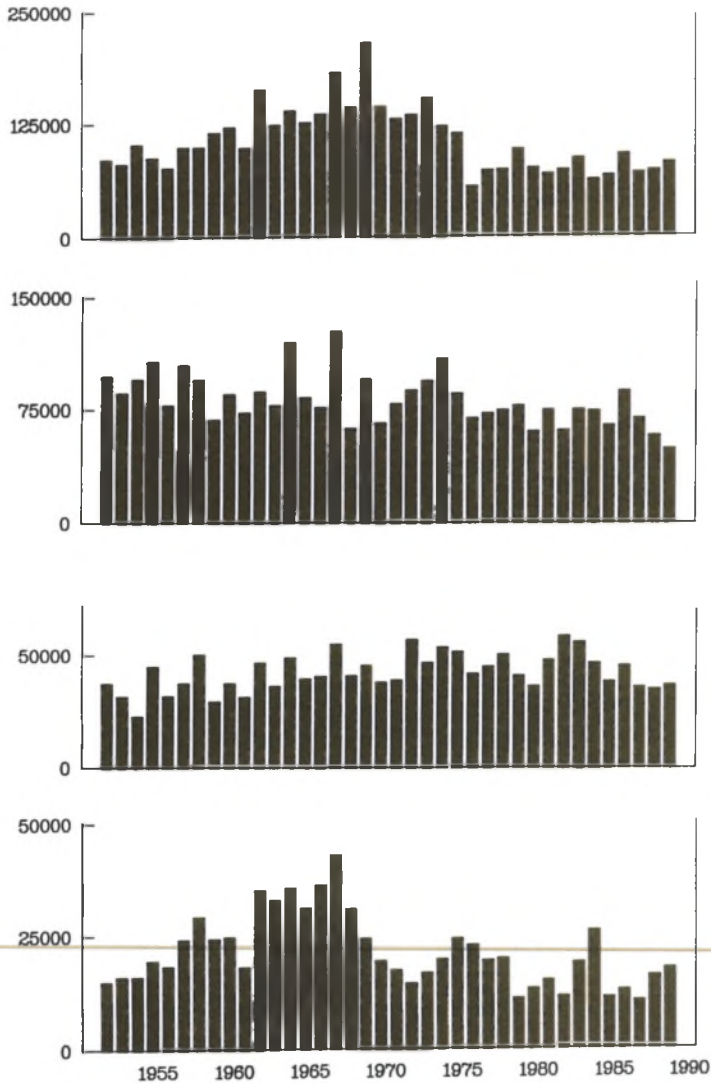


Figure 5 Numbers of salmon caught by all methods (nets and rods) in four regions of Scotland 1952 to 1989. The regions are, from top to bottom: East, Moray Firth, North, and Solway.

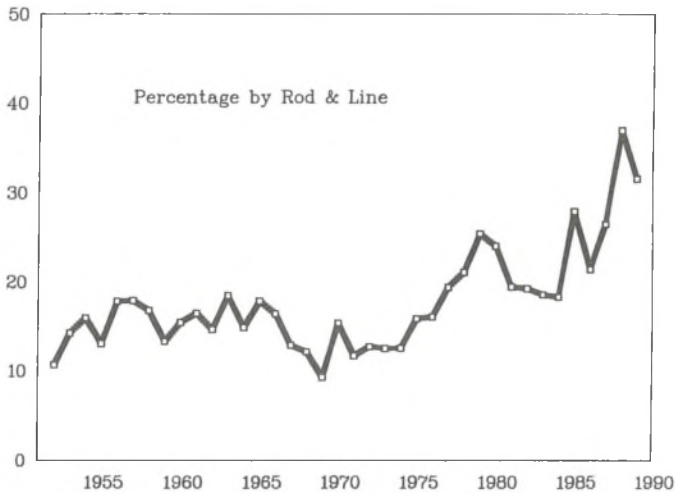


Figure 6 Number of salmon caught by rod and line in Scotland expressed as a percentage of the total catch.

The nets catch more fish than the rods but the proportion taken by rod and line is much higher now than in the years before 1977, see Figure 6 above. This is due mainly to a reduction in the catch by nets and, following the recent buy-out of some netting stations, is unlikely to be reversed.

Sea trout are not discussed in this booklet but it should be noted that in many "salmon" fisheries, sea trout are a significant part of the catch and, in some, are most important.

#### INTERCEPTION FISHERIES

*"Why should I be fool enough to let what's mine  
be taken from me? What right has another  
to swallow the sheep I pasture"*

There is much concern about the effect of the relatively new fisheries for mixed stocks of salmon, including Scottish salmon, on the high seas and in the coastal waters of other countries. These are sometimes called "interception" fisheries. The term is handy, but any salmon fishery acts to intercept a fish before it reaches the next stage on its predestined journey. A more limited definition is therefore required. Here it is used to mean a fishery that takes a significant number of salmon which originate in another country; and, for that purpose, Scotland and England are treated as separate countries (because they have separate and different salmon fisheries administrations).



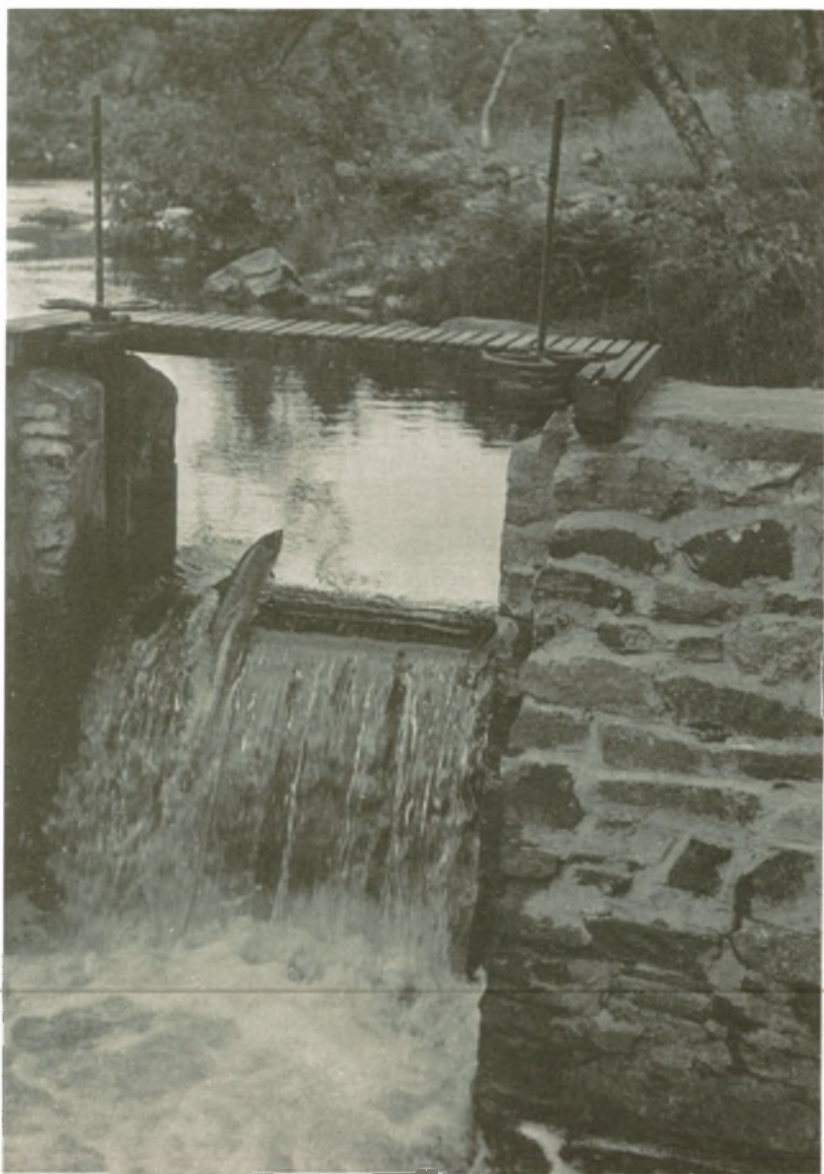
The interception fisheries of greatest consequence for Scottish salmon stocks and fisheries are:

- the English north-east coast drift-net fishery;
- the Faroese long-line fishery;
- the West Greenland drift-net fishery; and
- the drift-net fishery off the north and west of Ireland.

The drift-net fishery off Ireland is described in Kenneth Vicker's booklet on Irish salmon fisheries.<sup>30</sup> The Faroese and Greenlandic fisheries have also been described in earlier booklets in this series;<sup>31</sup> they are now subject to international regulation under the North Atlantic Salmon Conservation Organisation (NASCO). The current annual quotas are 550 tonnes for Faroes and 840 tonnes for Greenland - both substantial reductions on earlier, unregulated, catches of about 1000 and 2000 tonnes respectively. NASCO was created in 1982, by international treaty, to regulate fisheries on salmon stocks which migrate beyond the fisheries jurisdictions of the coastal states of the North Atlantic Ocean. Scotland is represented through the European Community which is party to the treaty. It is fitting that the headquarters of NASCO is in Edinburgh, for Scotland has long subscribed to the basic principle on management of anadromous fish, articulated in the UN Convention on the Law of the Sea, and now, for Atlantic salmon, expressed in NASCO.

The present drift-net fishery on the English north-east coast dates from about 1960 when, with the advent of nylon drift nets, the previously small salmon fishery on the coast of Northumbria and Yorkshire increased in scope and scale. Salmon-tagging experiments in 1977-1979 showed that the drift-nets off Northumbria and Yorkshire take salmon which are returning to rivers on the east coast of Scotland as far north as about Aberdeen, but that the greatest effect is on the southern rivers - the Tweed, Forth and Tay. It was estimated that more than 94% of the salmon caught in the Northumbrian fishery were destined for Scottish rivers and it can be calculated that, at that time, the fishery accounted for about 40% of the total catch of Tweed fish in British waters.<sup>32</sup>

The results of the experiments led to increased pressure to have drift netting banned in England (as it had already been in Scotland, see page 15). Some proposals were put to Parliament in 1986 and, as a result, the Government is engaged in a statutory review of the net fisheries on the east coast between Spurn Head and Rattray Head. It is expected to report in 1991.



A salmon clears the top pool of a small fish pass at Rogie Falls in the Conon District  
*(photo Derek Mills)*

## SOME ASPECTS OF MANAGEMENT

### RESEARCH

*"Sitting on a high rock I keep a look-out  
on the river's transparent waters for the  
glittering shoal's scaly backs"*

It is not surprising that Scotland, with its important salmon fisheries, has a long history of salmon research. Hector Boece, a Scottish historian, is credited with publishing the first substantially accurate account of the life history of salmon in 1527.<sup>33</sup> And it was also in Scotland, in the 1830s, that Mr Shaw, head keeper at Drumlanrig on the Nith, proved what many had believed for long, *ie* that the parr or samlet was indeed a young salmon.

The formal organisation of Scottish salmon fisheries research is more recent and came with the establishment of the Fisheries Board for Scotland in 1882 and especially with the work of Calderwood and Menzies, its Inspectors of Salmon Fisheries from 1898 to 1949. In the 1950s, the Government's salmon fisheries research work was brought under the management of the Brown Trout Laboratory, which had recently been established at Faskally, Pitlochry, by the Scottish Home Department and the North of Scotland Hydro-Electric Board. Its name was duly changed to the present "Freshwater Fisheries Laboratory" in 1957.

The Laboratory's salmon research programme includes studies on population dynamics, ecology, genetics, behaviour, physiology and disease. It also investigates the effect of various environmental factors on the production of salmon in freshwater. Some of the work is done at the Marine Laboratory in Aberdeen (the headquarters of the Directorate of Fisheries Research) and some at Montrose where the Freshwater Laboratory has a permanent sub-station to service its long-term work on the salmon stocks and fisheries of the River North Esk. The current work is described in the Laboratory's Annual Reports.<sup>34</sup>

From time to time, staff at the Scottish universities also study salmon. For instance, the Institute of Aquaculture, at Stirling University, has a significant programme of salmon work; and Aberdeen University, as befits its situation between the Rivers Dee and Don, has also recently been involved in salmon research - and, it could be said, started with salmon for its buildings were in part financed by revenue from salmon fisheries on the Don held by its founder, Bishop Elphinstone, at the end of the 15th century.

Some district salmon fishery boards (or associated trusts) have recently appointed biologists to help in the management of the fisheries and do some local research work.

Scottish Hydro-Electric, the successor to the North of Scotland Hydro-Electric Board, has its own laboratory, also at Pitlochry, which does some salmon work in relation to its schemes and programmes. The first electric fish counters used in Scotland were developed at that laboratory.

The Atlantic Salmon Trust has always been interested in promoting research on salmon and salmon fisheries in Scotland (indeed its original name was the Atlantic Salmon Research Trust). It funds various programmes on a modest, but often critical, scale, usually jointly with a Government Department or one of the universities.

Some of the salmon research projects involve tagging fish and releasing them to the wild. Fishermen or others finding tagged salmon in Scotland should send the tag, with full details of the fish, where caught etc, and some scales from its side, to "Fishlab", Pitlochry, Scotland.

#### HATCHERIES AND STOCKING POLICIES

The first record of artificial propagation of salmon in Scotland is that of Shaw in 1836. By 1853 the proprietors on the River Tay were propagating salmon on a significant scale.<sup>35</sup> It was not long before others were doing the same and in 1900 the Fishery Board for Scotland reported 22 salmon hatcheries and rearing ponds scattered the length and breadth of the country.

Salmon hatching and stocking is an attractive idea but some of the early enthusiasts did not realise that stocking would not necessarily increase production: *ie* that there was a finite limit to the rearing capacity of a river or burn and that many waters were fully stocked already. As one owner put it, when closing his hatchery in the late 1800s: "the river probably holds as many fish bred by natural means as are likely to remain in a healthy condition".<sup>36</sup> Most of the first hatcheries did not last very long.

There was further interest in hatcheries with the development of hydro-electric power. Some of the schemes flooded good spawning and nursery areas or took so much water from tributaries that they could no longer support salmon. In compensation, the developers provided salmon hatcheries and funds to ensure that eggs or fry were planted out in places (some of them previously inaccessible to salmon) where they could grow and develop into smolts. The North of Scotland Hydro-Electric Board also established a smolt-rearing station at Invergarry in the mid 1950's for experimental work.

Stocking policies are decided by each district salmon fishery board and depend on the circumstances in its district; some boards have their own hatchery. It is an offence to stock salmon in inland waters (other than a fish farm) except with the consent of the relevant district board. In areas where no district board is yet established, an individual proprietor may stock on his own authority.

In the past, salmon were most frequently planted-out as eyed eggs, unfed fry or, sometimes, fed fry. More recently there has been much stocking with parr. This was a spin-off from the commercial salmon farming industry. The farmers often did not want to grow-on the slower-growing parr, which were going to take an extra year before smolting, so offered them very cheap - or even free - to the local salmon fishery interests. Many accepted, and hundreds of thousands of parr were stocked. Local managers are now more wary of such gifts; the fish might not be especially well-suited to the wild or to the receiving river. They may therefore not be much use or, worse, if they survive long enough to compete with and displace some of the native parr, they could even have an adverse effect.

The most recent reasonably comprehensive estimate of the amount of salmon stocked into Scottish rivers is for 1987: 10.5 million eggs and un-fed fry; 1.3 million fed fry and parr; and 0.2 million smolts and pre-smolts.

#### SALMON RANCHING

*"The stream is my farm, salmon my yearly crop"*

Salmon ranching is a special sort of fish-farming or stock management: the release of smolts to the wild for growth in the sea and the eventual recapture of the survivors by or on behalf of the releaser at or close to the release site. It depends on the known homing behaviour of the fish. Ranching does not include stocking with eggs, fry, parr, or even smolts, to enhance a wild stock if no special arrangement is made for their recapture.

It has been successful for some species of Pacific salmon whose young go to sea as fry. It is also being tried with Atlantic salmon (notably in Iceland - but the economics are disappointing). There have been experiments on a small scale at a few sites in Scotland, but without conspicuous success: none is now operating. However, provision was made in the 1986 Salmon Act to allow the Government to permit special arrangements for catching salmon where all the salmon fishery owners in the relevant district agree. This is to allow the operation of single-trap fisheries on rivers (as advocated by the Hunter Committee, see page 16) or special arrangements for the recapture of ranches fish. So the legal framework is a little easier now than formerly.

### DISEASE CONTROL

The Diseases of Fish Acts 1937-83 are now usually thought of as a means of preventing the spread of disease among fish farms. The 1937 Act was however the result of recommendations from a committee<sup>37</sup> set up to enquire into outbreaks of furunculosis in wild salmon and trout populations in the 1920's. It was intended to prevent the spread of disease from fish farms to wild stocks.

Under the Act, the import of live salmonids into Britain is prohibited except, under licence, from an area specified by order under the Act.

Provision was also made to control the movement of live fish within the country: anyone suspecting a notifiable disease in his fishery or fish farm is obliged to report it to the Department. If the presence of the disease is confirmed, a "Designated Area Order" (DAO) may be made, under which movement of any fish out of the area can be controlled by the Department. Under provisions made in the 1983 Act, all fish farms and hatcheries have to be registered and have to keep records of their stocks and stock movements.

At present, the notifiable diseases are:

furunculosis in salmon; whirling disease (*Myxosoma cerebralis*), infectious pancreatic necrosis (IPN); bacterial kidney disease (BKD); enteric redmouth (ERM); spring viremia of carp (SVC); infectious salmon anaemia (ISA); viral haemorrhagic septicaemia (VHS)\*; infectious haematopoietic necrosis (IHN)\*; and gyrodactyliasis (*Gyrodactylus salaris*)\*

The diseases marked with an asterisk are believed not to be present in Britain - their inclusion is to allow rapid action if their presence becomes suspected.

Some fish diseases can be spread by dead fish and, in 1986, in an attempt to reduce the risk of importing new diseases, an order was made under the Animal Health Act 1981 to prohibit the import of the viscera of salmonid fish except under licence.

The Member States of the European Community have discussed new proposals for the prevention and control of fish disease in the Community. These are intended to come into effect in 1993. They will supersede some of the arrangements described above.

## SOME MODERN DEVELOPMENTS

### HYDRO-ELECTRIC SCHEMES

*"These, when the fish are striving towards the upper waters, hinder their efforts and bar their paths"*

The rivers in the highlands of Scotland have attracted not just salmon anglers but also engineers, keen to develop hydro-electric power.

The first projects were small and often at sites where steep natural falls obstructed the passage of salmon anyway. The larger private development for aluminium smelting at Foyers at the end of the 19th century, and later in Lochaber, were also based on waters inaccessible to salmon. It was the privately-developed public electric-supply schemes of the 1920's and 1930's that saw the first substantial developments on salmon rivers, including the Galloway scheme where the bottom dam was almost at the estuary of the River Dee and where an efficient fish pass was essential to any continued salmon fishery in that system. Provision for passes and salmon hatcheries was specified in the Act which authorised the scheme; the arrangements were subject to approval by the local District Salmon Fishery Board, failing which the Fishery Board for Scotland.

Under the Hydro-Electric Development (Scotland) Act 1943, a Board was established to develop hydro-electric power in the Scottish highlands. It was exempted from the need to comply with the 19th century fish-pass regulations applying to ordinary mill dams but its proposals for preventing damage to fish stocks and fisheries were subject to consideration by a Fisheries Committee appointed by the Government for that purpose.

The Board's first proposal that would have a significant effect on salmon, a scheme on the River Tay system involving the Rivers Tummel and Garry, provoked great controversy. A tribunal was appointed to hear objections and the proposals were fiercely debated in Parliament. The decision turned on the effects on general amenity and salmon fisheries. It was eventually decided that, although there was a risk of some adverse effect on salmon, the potential benefit to the community as a whole was such that the entire scheme should be approved (thus over-riding the recommendations of the Fisheries Committee). The various salmon experts appearing before the tribunal produced such vehemently contradictory opinions that the chairman remarked: "It seems to be a very uncertain business being a fisheries expert".<sup>38</sup> Approval of the scheme was the watershed for the Board - many schemes were put forward and constructed in the next 15 years.

Whatever the results have been for the salmon, and clearly some have been bad, there is no doubting the Board's thorough commitment to providing for the safe passage of salmon past its installations - much advice was taken and much money spent. Various sorts of fish pass were installed including: conventional pool and over-fall, submerged orifice, and Borland fish lift. The last, a sort of automatic fish lock, is economic at high heads - but not all of them have passed as many fish as were originally expected. They are installed at several dams in Scotland at heads from 3 to 60 metres; the diagram below shows the main features.

Ensuring that smolts find a safe way downstream past dams and turbines has proved to be as great a problem as ensuring the upstream passage of adults.

The 1943 Act has been superseded by subsequent legislation and private companies have recently succeeded the state Electricity Boards. They have a statutory duty to avoid, so far as possible, injury to fish and fisheries. The Fisheries Committee has been retained to advise the Government and the companies on the fisheries aspects of hydro-electric works.

Salmon can leap great heights (see Dr Mills' picture at the frontispiece) but, depending on the hydraulic conditions, dams or weirs as low as 1.5 m can be quite impassable. It is therefore important that suitable fish passes are made. Any mill dam not built under the Electricity Acts must comply with fish-pass regulations made under an Act of 1862. These, though soundly based at the time, are now somewhat dated and are under review. It is anticipated that new regulations will not be restricted to mill dams.

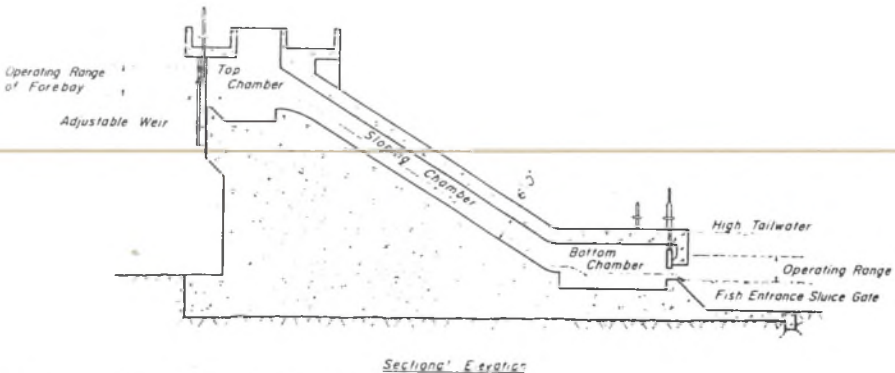


Diagram of a Borland fish lift (from Clay<sup>39</sup>)



### IMPACT OF COMMERCIAL SALMON FARMING

Juvenile salmon have been artificially reared in Scotland for over 100 years, but farming salmon in the sea did not start until the 1960's. The industry expanded rapidly during the 1980's. It has already had a dramatic effect on salmon fisheries; and fear of other effects has alarmed some of those concerned with the protection of wild stocks.

Estimated production of farmed salmon in Scotland in 1990 was about 32,000 tonnes (and there is an even larger production in Norway). This compares with an annual Scottish catch of less than 1,000 tonnes of "wild" salmon in each of the three years to 1989 (and a 50-year maximum of 2,100 tonnes in 1967). Because of the increased supply of farmed fish, the wholesale price of salmon has not kept pace with inflation. This has adversely affected the economy of the salmon netting stations and many have closed or operate at a reduced scale. (It will not have had such a significant effect on poachers who do not have to bear the same costs as lawful netmen.)

It is more difficult to assess other factors such as the risk of disease in wild stocks and the effects that escaped farmed fish might have on them.

The Diseases of Fish Act 1937 recognised the problem created by the transfer of salmonids from place to place, and it has helped to contain infectious disease. Nonetheless, salmon farming can still spread infection. Although many of the bacteria, viruses etc are thought to be less of a problem among wild stocks than to farmed fish (which may be under greater stress), outbreaks of disease in the wild can follow. The occurrence of gyrodactyliasis (*Gyrodactylus salaris*) among salmon in several Norwegian rivers - apparently introduced from Sweden with farmed salmon - is the most striking recent example.

Large numbers of farmed salmon have escaped from cages on the west and north coasts of Scotland and they now form a significant part of the catch at some netting stations. They also run into rivers to spawn; research by the Scottish Office Agriculture and Fisheries Department and the Atlantic Salmon Trust has shown that they can interbreed with the native stocks. The investigations are continuing and it is too early to say in what ways, and how much, the present level of escapes will affect the various wild stocks.

### SOME OTHER FACTORS

**Acid Rain** is a form of aerial pollution that has an effect on the acidity of streams and lochs in parts of Scotland. The most acidic rain falls in the east of the country where, fortunately, the total rainfall is less and the richer soils are able to neutralise the acid inputs. The main problem areas are parts of the

south-west, some high streams in the Grampian mountains and other base-poor areas in the west and north. So far, damage to salmon stocks appears to be restricted to some tributaries of a few systems.

**Forestry** Planted forest now covers about 13.5% of Scotland and the acreage is increasing.<sup>40</sup> With new techniques and species, the plantations now spread over high ground and wet land that would previously have been left unplanted; and, with changes in agricultural economics, even arable land in valley bottoms may be afforested. It is well recognised that these developments can adversely affect salmon. The problems include: increased sediment in rivers from forest ploughing and drains; changes in the hydrological regime after draining and as the forest grows up; complete shading of small streams; scavenging acid pollutants from the air; careless road construction etc. The Forestry Commission and others now produce booklets and guidelines in an attempt to minimise the adverse effect of forestry on fish and freshwaters.<sup>41</sup>

**Seals and Goosanders** The great increase in the Scottish population of grey seals has had an effect on salmon fisheries. The common seal, though less numerous, is also a predator on salmon. The introduction of synthetic twines in the 1960's reduced the amount of damaged gear (and escape of fish) but many salmon are still taken at netting stations and in estuaries. There is some concern that the most significant effect may be on the spring-running fish. The killing of seals is controlled under the Conservation of Seals Act 1970. Public reaction against a proposed cull of grey seals in 1978, and continued concern since, led to a series of research projects in an attempt to create a more widely acceptable basis for managing the populations.

Like the grey seals, the Scottish goosander population has increased greatly in the last 50 years. It eats salmon smolts and parr, and is now present in such numbers that it could have a significant effect of salmon stocks in some rivers. Until 1981, district boards, fishery owners and others could shoot them but, since then, the birds have been protected and a licence is required under the Wildlife and Countryside Act 1981 (the same is true for other fish-eating birds such as mergansers, cormorants and herons). As with seals, the Government has commissioned research on the goosander to provide a better basis for its policy in relation to preventing damage to the fisheries.

The public concern about killing some seals or goosanders to protect salmon fisheries is one facet of the modern "green revolution" (and can be balanced against other aspects which favour the fisheries).

## CONCLUSION

It may not be necessary or appropriate to express conclusions in an account of this sort, but one characteristic of the Scottish salmon fishery deserves emphasis: the regime of marketable fishing rights and legislative control of fishing methods and seasons has provided a mechanism that is both robust and flexible, and that has not required authoritarian regulation of the amount of fishing effort. The system appears to have worked remarkably well over many centuries of active and sometimes intensive fishing. In its results, it compares favourably with some more bureaucratic systems used elsewhere. Though ancient, it is also in some ways up-to-date and close to modern concepts of fishery resource management. It is worth understanding.

### TAILPIECE

Johnstone's *A Fisher's Apology* has provided the chapter-head quotations. He does not fail us at the end. The Fisherman, in drafting his own epitaph, saw "no difference in point of preferableness" between the two ultimate destinations, for:

*"There are fish in the Heavens; there are  
rivers in Hell: either region affords him,  
now his day is done, the means of sport."*

But perhaps, taking a vignette from an old Scottish book on trout,<sup>42</sup> and borrowing now from an English poet, it is fitting that the fish should have the last word:



*"Thus does the salmon vault"* DRYDEN

## APPENDIX

### NOTES

(Numbers relate to the superscript numbers in the text)

- 1 Prose translation in *The Golden Treasury of Scottish Poetry*, edited Hugh MacDiarmid, Macmillan & Co, London, 1948.
- 2 Chambers Biographical Dictionary, W & R Chambers, Edinburgh, 1974.
- 3 Gardiner and Egghishaw; A map of the distribution in Scottish rivers of the Atlantic salmon; obtainable from the Scottish Office Library, Room 2/65, New St Andrew's House, Edinburgh EH1 3TG, £4.00 post free.
- 4 Stewart, *Law of Fishing*, T & T Clark, Edinburgh 1892, citing *Gammell v Commissioners of Woods*, 1859, 3 Macq. 419.
- 5 *Johnston and Sons Ltd v Morrison*, 1962, SLT 322.
- 6 Act of James I, 1429, c.131.
- 7 Act of James VI, 1606, c.5.
- 8 Most recently by the Water Act 1989, c.15.
- 9 Solway Salmon Fisheries Commissioners (Scotland) Act 1877.
- 10 Drawing from "Salmon Fisheries of Scotland" by the Association of Scottish District Salmon Fisheries Boards, Fishing News Books, London.
- 11 See, for example, *Tait's Game and Fishing Laws of Scotland*, 2nd edition (p 236), W Green and Son, Edinburgh, 1928.
- 12 This paragraph paraphrased from Stewart's *Law of fishing*, 2nd edition (p 166), T & T Clark, Edinburgh, 1892.
- 13 Law of William I (1165-1214); some doubt its authenticity (eg Lord Cooper of Culross suggested that its provisions were "invented by some mediaeval A P Herbert") but others believe it probably genuine and it was founded-on in a case as recently as 1826 (*Kintore v Forbes*, 4 Shaw 641).
- 14 Act of James II, 1457, c.34.
- 15 *Hay v Magistrates of Perth*, 1863, 4 Macq. at 543.
- 16 For example, the extention of time allowed for rod fishing under the Salmon Fisheries (Scotland) Act 1862 and the change to the weekly close time for net fishing in 1988.
- 17 See section 43(2) of the Salmon Act 1986 - the necessary Order has not yet been made.
- 18 By bylaws made by Commissioners appointed under the Salmon Fisheries (Scotland) Act 1862; can be changed or added to under the Salmon Act 1986.
- 19 For discussion as to what is meant by fair net and coble fishing see *Hay v Magistrates of Perth*, 1863, 4 Macq. 535.
- 20 Described in Calderwood, *The Salmon Rivers and Lochs of Scotland*, 2nd edition, p. 122, Arnold, London, 1921.
- 21 See, for example, Scott and Neher, "Public Regulation of Commercial Fisheries in Canada", Economic Council of Canada, Canadian Government Publishing Centre, Ottawa, 1981.
- 22 Mr Hector's evidence to the House of Commons Select Committee on the Salmon Fisheries of Scotland, 1836.
- 23 Hector, "The Bag Net"; in *The Salmon Net*, No. 2, 1966.
- 24 For discussion of this see page 16 and *The Salmon and Freshwater Fisheries of Scotland* (the Hunter Committee Reports), 1963 (Cmnd 2096) and 1965 (Cmnd 2691).
- 25 Camden's *Brittania*, Hollands translation, 1610.
- 26 *Salmon and Freshwater Fisheries of Scotland*, 1963, Cmnd 2096.

- 27 Part of a remarkable week's fishing; described in an article in "The Field" for 8th November 1902.
- 28 Open letter to the Fisheries Board for Scotland, Burness and Co, Edinburgh, 1885.
- 29 Scottish Salmon Catch Statistics 1952-1982 (2 vols); and Scottish Salmon and Sea Trout Catches - annual Statistical Bulletins 1982- ; all published by the Department of Agriculture and Fisheries for Scotland, Edinburgh.
- 30 Vickers, "A review of Irish salmon and salmon fisheries", Atlantic Salmon Trust, Pitlochry, 1988.
- 31 Mills and Smart, "Report on a visit to the Faroes"; and Kreiberg, "Report of the joint Greenland expedition (1980)"; both Atlantic Salmon Trust, Farnham.
- 32 The results of the experiment are given in: Potter and Swain, Effects of north-east coast salmon fisheries on Scottish salmon catches, Fisheries Research Technical Report No. 67, MAFF, Lowestoft, 1982.
- 33 *Scotorum Historiae - Scotorum Regia Descriptio*, folio XII, 1527.
- 34 Annual Review; copies available from Freshwater Fisheries Laboratory, Pitlochry, PH16 5LB.
- 35 Day, "Salmonidae of Britain", William and Norman, London, 1887.
- 36 Fishery Board for Scotland, Report for 1900, part II, p. 88, HMSO, Glasgow, 1901.
- 37 The Furunculosis Committee, (A Departmental Committee appointed in 1929).
- 38 Quoted in "The Hydro", by P L Payne, Aberdeen University Press, 1988; a good account of the development of hydro-electric schemes in Scotland but without much detail on salmon fishery aspects.
- 39 Clay, "Design of Fishways", Queen's Printer, Ottawa, 1961.
- 40 The impact of afforestation and forestry practice on freshwater habitats; Focus on Nature Conservation No. 23, Nature Conservancy Council, Peterborough, 1990.
- 41 Forests and Water - Guidelines; Forestry Commission, Edinburgh.
- 42 Harvie-Brown, "The Wonderful Trout", David Douglas, Edinburgh, 1898.

**SOME BOOKS AND REPORTS ON SCOTTISH SALMON FISHERIES****Reports of Committees, Commissions etc**

House of Lords Select Committee on Salmon Fisheries of Scotland, 1860  
Departmental Commission of Enquiry into the Effect of Recent Legislation on the Salmon Fisheries of Scotland, 1871, (C.419).

Departmental Committee on the Crown Rights in Salmon Fishing in Scotland, 1890, (C.6036).

Royal Commission on Salmon Fisheries (Elgin Commission), 1902.

Departmental Committee on Poaching and Illegal Fishing of Salmon and Trout in Scotland (Machonochie Committee), 1950, (Cmnd 7917).

Departmental Committee on Scottish Salmon and Trout Fisheries (Hunter Committee), 1963 (Cmnd 2096) and 1965 (Cmnd 2691).

**Books**

The Salmon Rivers of Scotland, A Grimble, Kegan Paul, London, 1898.

The Salmon Rivers and Lochs of Scotland, W L Calderwood, Arnold, London, 1921.

Salmon Fisheries of Scotland, Association of District Salmon Fishery Boards, Fishing News Books, London, 1977.

The great salmon rivers of Scotland: an anglers guide to the rivers Dee, Spey, Tay and Tweed. J. Ashley Cooper, 1980.

The Salmon Rivers of Scotland, D H Mills and N C Graesser, Cassell, London, 1981.

The Status of Atlantic Salmon in Scotland, D Jenkins and W M Shearer, Institute of Terrestrial Ecology, Huntingdon, 1986.

The Salmon Net, The annual journal of the Salmon Net Fishing Association of Scotland, Aberdeen, 1962.

**Fishing Guides**

Salmon and Sea Trout Fisheries of Scotland: An anglers guide. Crawford Little, Unwin Hyman, London, 1990.



**Map of Scotland showing the main salmon fishing rivers**  
(Orkney and Shetland Islands not shown)

### LIST OF SALMON FISHERY DISTRICTS with annual close times for salmon fishing

Salmon Fishery District	Annual Close Time	Annual Close Time
	for Net-fishing	for Rod-fishing
	(All Dates Inclusive)	
Add	1 Sept - 15 Feb	1 Nov - 15 Feb
Ailort	27 Aug - 10 Feb	1 Nov - 10 Feb
Allne	27 Aug - 10 Feb	1 Nov - 10 Feb
Alness	27 Aug - 10 Feb	1 Nov - 10 Feb
Annan	10 Sept - 24 Feb	16 Nov - 24 Feb
Applecross	27 Aug - 10 Feb	1 Nov - 10 Feb
Arnisdale	27 Aug - 10 Feb	1 Nov - 10 Feb
Awe	27 Aug - 10 Feb	16 Oct - 10 Feb
Ayr	27 Aug - 10 Feb	1 Nov - 10 Feb
Ban and Goladoir	27 Aug - 10 Feb	1 Nov - 10 Feb
Badachro and Kerry	27 Aug - 10 Feb	1 Nov - 10 Feb
Balgay and Shieldaig	27 Aug - 10 Feb	1 Nov - 10 Feb
Benuly	27 Aug - 10 Feb	16 Oct - 10 Feb
Bludnoch	27 Aug - 10 Feb	1 Nov - 10 Feb
Broom	27 Aug - 10 Feb	1 Nov - 10 Feb
Brora	27 Aug - 10 Feb	16 Oct - 31 Jan
CAITHNESS		
Fors	27 Aug - 10 Feb	1 Nov - 10 Feb
Thurso	27 Aug - 10 Feb	6 Oct - 10 Jan
Wick	27 Aug - 10 Feb	1 Nov - 10 Feb
Dunbeath	27 Aug - 10 Feb	16 Oct - 10 Feb
Berriedale	27 Aug - 10 Feb	1 Nov - 10 Feb
Carradale	10 Sept - 24 Feb	1 Nov - 24 Feb
Carron	27 Aug - 10 Feb	1 Nov - 10 Feb
Clayburn	10 Sept - 24 Feb	1 Nov - 24 Feb
Clyde and Leven	27 Aug - 10 Feb	1 Nov - 10 Feb
Conon	27 Aug - 10 Feb	1 Oct - 25 Jan
Cree	14 Sept - 28 Feb	15 Oct - 28 Feb
Creran (Loch Creran)	27 Aug - 10 Feb	1 Nov - 10 Feb
Crowe and Shiel (Loch Dulch)	27 Aug - 10 Feb	1 Nov - 10 Feb
DEE (Aberdeenshire)		
Dee	27 Aug - 10 Feb	1 Oct - 31 Jan
R. Cowie	27 Aug - 10 Feb	1 Nov - 10 Feb
R. Carron	27 Aug - 10 Feb	1 Nov - 10 Feb
Dee (Kirkcudbright)	27 Aug - 10 Feb	1 Nov - 10 Feb
Deveron	27 Aug - 10 Feb	1 Nov - 10 Feb
Don	27 Aug - 10 Feb	1 Nov - 10 Feb
Doon	27 Aug - 10 Feb	1 Nov - 10 Feb
Drummachloy (Bute)	1 Sept - 15 Feb	16 Oct - 15 Feb
Eachaig	1 Sept - 15 Feb	1 Nov - 15 Feb
East Lewis	27 Aug - 10 Feb	17 Oct - 10 Feb
ESKS		
Bervie	10 Sept - 24 Feb	1 Nov - 24 Feb
N. Esk	1 Sept - 15 Feb	1 Nov - 15 Feb
S. Esk	1 Sept - 15 Feb	1 Nov - 15 Feb
Ewe	27 Aug - 10 Feb	1 Nov - 10 Feb
Fincastle	10 Sept - 24 Feb	1 Nov - 24 Feb
Findhorn	27 Aug - 10 Feb	7 Oct - 10 Feb
Fleet (Sutherland)	10 Sept - 24 Feb	1 Nov - 24 Feb
Fleet (Kirkcudbright)	10 Sept - 24 Feb	1 Nov - 24 Feb



## SALMON FISHERIES IN SCOTLAND

41

Forth	27 Aug - 10 Feb	1 Nov - 31 Jan
Fyne, Shira and Aray	1 Sept - 15 Feb	1 Nov - 15 Feb
Girvan	10 Sept - 24 Feb	1 Nov - 24 Feb
Glenelg	27 Aug - 10 Feb	1 Nov - 10 Feb
Gour	27 Aug - 10 Feb	1 Nov - 10 Feb
Grudie or Dionard	27 Aug - 10 Feb	1 Nov - 10 Feb
Gruinard and Little Gruinard	27 Aug - 10 Feb	1 Nov - 10 Feb
Halladale	27 Aug - 10 Feb	1 Oct - 11 Jan
Helmsdale	27 Aug - 10 Feb	1 Oct - 10 Jan
Hope and Polla	27 Aug - 10 Feb	1 Oct - 11 Jan
Howmore	10 Sept - 24 Feb	1 Nov - 24 Feb
Inchard	27 Aug - 10 Feb	1 Nov - 10 Feb
Inner (Jura)	10 Sept - 24 Feb	1 Nov - 24 Feb
Inver	27 Aug - 10 Feb	1 Nov - 10 Feb
Iorsa (Arran)	10 Sept - 24 Feb	1 Nov - 24 Feb
IRVINE AND GARNOCK		
R Irvine	10 Sept - 24 Feb	16 Nov - 24 Feb
R Garnock	10 Sept - 24 Feb	1 Nov - 24 Feb
Kannaird	27 Aug - 10 Feb	1 Nov - 10 Feb
Kilchoan (Loch Nevis)	27 Aug - 10 Feb	1 Nov - 10 Feb
Kinloch (Kyle of Tongue)	27 Aug - 10 Feb	1 Nov - 10 Feb
Kirkaig	27 Aug - 10 Feb	1 Nov - 10 Feb
Kishorn	27 Aug - 10 Feb	1 Nov - 10 Feb
Kyle of Sutherland	27 Aug - 10 Feb	1 Oct - 10 Jan
Laggan and Sorn (Islay)	10 Sept - 24 Feb	1 Nov - 24 Feb
Laxford	27 Aug - 10 Feb	1 Nov - 10 Feb
Leven	27 Aug - 10 Feb	1 Nov - 10 Feb
Little Loch Broom	27 Aug - 10 Feb	1 Nov - 10 Feb
Loch Long	27 Aug - 10 Feb	1 Nov - 10 Feb
Loch Roag	27 Aug - 10 Feb	17 Oct - 10 Feb
Lochy	27 Aug - 10 Feb	1 Nov - 10 Feb
Lossie	27 Aug - 24 Feb	1 Nov - 24 Feb
Luce	10 Sept - 24 Feb	1 Nov - 24 Feb
Lussa (Mull)	27 Aug - 10 Feb	1 Nov - 10 Feb
Moidart	27 Aug - 10 Feb	1 Nov - 10 Feb
Morar	27 Aug - 10 Feb	1 Nov - 10 Feb
Mullanageren etc (N. Uist)	10 Sept - 24 Feb	1 Nov - 24 Feb
Nairn	27 Aug - 10 Feb	1 Oct - 10 Feb
Naver and Borgie	27 Aug - 10 Feb	1 Oct - 11 Jan
Nell, Feochan and Euchar	27 Aug - 10 Feb	1 Nov - 10 Feb
Ness	27 Aug - 10 Feb	16 Oct - 14 Jan
Nith	10 Sept - 24 Feb	1 Dec - 24 Feb
Orkney Islands	10 Sept - 24 Feb	1 Nov - 24 Feb
Ormsary	27 Aug - 10 Feb	1 Nov - 10 Feb
Pennygowan and Aros (Mull)	27 Aug - 10 Feb	1 Nov - 10 Feb
Resort	27 Aug - 10 Feb	1 Nov - 10 Feb
Ruel	1 Sept - 15 Feb	1 Nov - 15 Feb
Sanda	27 Aug - 10 Feb	1 Nov - 10 Feb
Scaddle	27 Aug - 10 Feb	1 Nov - 10 Feb
Shetlands Islands	10 Sept - 24 Feb	1 Nov - 24 Feb
Shiel (Loch Shiel)	27 Aug - 10 Feb	1 Nov - 10 Feb
Sligachan etc (Skye)	27 Aug - 10 Feb	1 Nov - 10 Feb
Snizort etc (Skye)	27 Aug - 10 Feb	1 Nov - 10 Feb
Spey	27 Aug - 10 Feb	1 Oct - 10 Feb
Stinchar	10 Sept - 24 Feb	1 Nov - 24 Feb
Strathly	27 Aug - 10 Feb	1 Oct - 11 Jan
Sunart (Loch)	27 Aug - 10 Feb	1 Nov - 10 Feb
TAY		
Tay	21 Aug - 4 Feb	16 Oct - 14 Jan
R. Earn	21 Aug - 4 Feb	1 Nov - 31 Jan
R. Eden	21 Aug - 4 Feb	1 Nov - 4 Feb
Torrison	27 Aug - 10 Feb	1 Nov - 10 Feb
Tweed	15 Sept - 14 Feb	1 Dec - 31 Jan
Ugie	10 Sept - 24 Feb	1 Nov - 9 Feb
Ullapool (Loch Broom)	27 Aug - 10 Feb	1 Nov - 10 Feb
Urr	10 Sept - 24 Feb	1 Dec - 24 Feb
Ythan	10 Sept - 24 Feb	1 Nov - 10 Feb

## INFORMATION ABOUT THE ATLANTIC SALMON TRUST

### OFFICERS AND OFFICIALS OF THE TRUST

Patron:	HRH The Prince of Wales
President:	The Duke of Wellington
Vice Presidents:	Vice-Admiral Sir Hugh Mackenzie Mr. David Clarke
Chairman:	Sir David Nickson
Vice Chairman:	Lord Moran
Chairman of HSAP:	Dr. D. H. Mills
Director:	Rear Admiral D. J. Mackenzie
Deputy Director/ Secretary	Captain J. B. D. Read, RN
Treasurer:	Mr. P. J. Tomlin

The Atlantic Salmon Trust is a company, limited by guarantee and registered as a charity. Its main objective is to encourage and assist the conservation and enhancement of wild salmon and sea trout stocks in the United Kingdom. It draws attention to particular dangers facing those stocks; finances scientific research; arranges workshops and conferences; and publishes booklets on salmon and salmon fisheries for managers, scientists and fishermen. The Council of the Trust is assisted by an Honorary Scientific Advisory Panel under the chairmanship of Dr. Derek Mills. Its members are listed on the back cover.

The Trust is funded by voluntary contributions from individuals, companies, and trusts and from organisations interested in conserving the salmon, with special project sponsorship by J&B Rare Scotch Whisky. It also derives considerable support from an annual Postal Auction, in which fishing generously given by owners is offered for sale on the Trust's behalf, providing access to many rivers which would not normally be available. The Trust is registered as a charity. It receives no support from any Government funds.

As a contributor to the Trust's finances you will receive copies of the six-monthly progress reports, and details of Blue Books as they are published. Support through a Deed of Covenant is particularly helpful and a covenant form and bankers order form are provided on the following pages for the convenience of those who might wish to support the Trust in this way.

THE ATLANTIC SALMON TRUST LTD.

DEED OF COVENANT

Please insert  
full name and  
address in  
BLOCK LETTERS

I,.....  
of.....  
.....

HEREBY COVENANT with THE ATLANTIC SALMON TRUST LTD. that for a period of

(i) ..... years from the date hereof or during my lifetime whichever period shall be the shorter, I will pay ANNUALLY to the said Trust for such charitable purposes of or connected with the Trust as the Trust shall think fit such a sum as will after deduction of Income Tax at the basic rate for the time being in force leave in the hands of

the Trust a sum equivalent to (ii) £.....

(..... pounds) such sum to be paid from my general fund of taxed income so that I shall receive no personal or private benefit in either of the said periods from the said sum or any part thereof.

IN WITNESS WHEREOF I have hereunto set my hand and seal this

(iii) .....day of .....19..

SIGNED SEALED AND DELIVERED by the said

.....

in the presence of Witness .....

Address .....

Occupation .....

-----  
(i) Insert number of years. A covenant must run for a minumum of four years.

(ii) Enter the ANNUAL amount you wish to subscribe, in figures and words.

(iii) This date must be the same as or later than the date on which the Deed is signed.  
-----

The most convenient method of payment is by Banker's Order. Please complete the form overleaf and send it with your Deed of Covenant to The Atlantic Salmon Trust, Moulin, Pitlochry, Perthshire PH16 5JQ.

THE ATLANTIC SALMON TRUST LTD.

BANKER'S ORDER

Subscriber's Bank To .....Bank Limited

Address & Branch .....

PLEASE PAY to MIDLAND BANK plc, 20 Eastcheap,

London EC3M 1ED (40-02-31) for the credit of THE

ATLANTIC SALMON TRUST LTD. A/C No. 41013874 the

sum of £ ..... (.....pounds)

on the (i) ..... day of .....19..

and a like amount on the same day each (ii)

month/quarter/half year/year for a total period

of (iii) ..... years. Total number of

payments .....

Signed ..... Date .....

Name in Block Letters .....

A/C No. ....

Address .....

.....

- 
- (i) This date must be the same as or later than the date on which the Deed is signed.
  - (ii) Please delete and initial the inappropriate words.
  - (iii) Insert number of years. A covenant must run for a minimum of four years.
- 

PLEASE DO NOT send the Banker's Order direct to your Bank.

(continued from inside front cover)

Genetics and the Management of the Atlantic Salmon	by T. Cross	2.50
Fish Movement in Relation to Freshwater Flow and Quality	by N.J. Milner	2.50
Acidification of Freshwaters: The Threat and its Mitigation	by R. North	3.00
Strategies for the Rehabilitation of Salmon Rivers (Proceedings of a Joint Conference held at the Linnean Society in November 1990)	by D. Mills	5.00

These books may be obtained from:

The Atlantic Salmon Trust  
Moulin  
Pitlochry  
Perthshire PH16 5JQ

#### HONORARY SCIENTIFIC ADVISORY PANEL

- D. H. Mills, M.Sc., Ph.D., F.I.F.M., F.L.S. (Institute of Ecology and Resource Management, Edinburgh University) Chairman  
W. J. Ayton, B.Sc., M.Sc., (Welsh, National Rivers Authority)  
J. Browne, M.Sc., (Department of the Marine, Dublin)  
J. S. Buchanan, B.Sc., Ph.D., C.Biol., M.I. Biol. (Scottish Salmon Growers Association)  
M. M. Halliday, Ph.D (Joseph Johnston & Sons Ltd.)  
G. Harris, Ph.D (Welsh Water plc.)  
G. J. A. Kennedy, B.Sc., D. Phil. (Department of Agriculture for Northern Ireland)  
E. D. Le Cren, M.A., M.S., F.I. Biol., F.I.F.M.  
I Mitchell, B.Sc. (Tay Salmon Fisheries Co. Ltd.)  
J. Solbe, B.Sc., C.Biol., F.I.F.M., M.I.Biol. (Unilever Research)  
D. Solomon, B.Sc., Ph.D., M.I.Biol., M.I.F.M.  
K. Whelan, B.Sc., Ph.D. (Salmon Research Agency of Ireland, Inc.)  
Professor Noel P. Wilkins, (Department of Zoology, National University of Ireland)

- Observers: K. O'Grady, B.Sc., Ph.D., M.I.F.M. F.L.S.  
(National Rivers Authority)  
A representative from the Scottish Office  
Agriculture and Fisheries Department  
E. C. E. Potter, B.A., M.A. (Ministry of  
Agriculture and Fisheries)

The Atlantic Salmon Trust  
Moulin, Pitlochry  
Perthshire PH16 5JQ  
Telephone: Pitlochry (0796) 3439