



Atlantic Salmon Trust
Winter Journal 2004/05

Research
Restore
Sustain



WHAT IS THE TRUST?

- Founded in 1967, the Trust is a UK-wide organisation which champions the wild salmon and sea trout – it does not represent any body, only the fish themselves.
- Works for the conservation and restoration of wild salmon and sea trout stocks to a level which allows sustainable exploitation
- Is an independent, registered Charity, with a small staff, which receives no Government funding

WHAT DOES THE TRUST DO?

- Conducts and supports marine and freshwater research
- Gives practical advice on the management of fisheries and rivers
- Gives independent advice to governments, international and national authorities and to commercial enterprises
- Co-ordinates activities with other conservation, environmental, fishery, heritage and wildlife agencies and organisations
- Holds and supports seminars and workshops to investigate specific issues
- Publishes high quality reports and booklets to inform and educate

WHAT ARE THE TRUST'S CURRENT ACTIVITIES AND PRIORITIES?

Promoting, taking part in or supporting:

- Research of the survival of salmon at sea
 - Restoration of wild salmon and sea trout stocks, especially on the West Coast of Scotland and the Islands
 - Reduction of interceptory mixed stock nets
 - Improvement of fish farming practices
 - Reduction of mammal and bird predation
 - Improving river habitats and water quality
- Improving all aspects of our education, information and communications roles.
- Playing a proactive part in all management committees and legislative fora.

Patron
HRH The Prince of Wales

President
Major General
The Duke of Westminster

Chairman
Colonel Bill Bewsher

Vice Chairman
Lord Guernsey

Research Director
Dr. Richard Shelton

Executive Director
Major General
Seymour Monro

Deputy Director & Company Secretary
Tim Hoggarth

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Visit his website at www.salmonphotos.com

Photographs:

Cover and page 2
Gilbert van Ryckevorsel

Other photographs:

Andrew Graham-Stewart, David Hay,
Bob Kindness, Seymour Monro, Iain Sadler
and John Webb.



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JOURNAL DATES

Winter Edition:
Contributions by 1st December.
Published early February.

Summer Edition:
Contributions by 1st May.
Published late June.

Welcome to the 'new-look' AST Winter Report – now re-named 'The Journal'. The intention is to give our readers more informative and interesting articles in a more attractive style than ever before.

Our Summer Newsletter – Scalereadings – will also be produced in this form in the future. Contributions

to The Journals are most welcome, and I take the opportunity to thank all those who have sent us articles and photographs for this edition.

Please note that articles do not necessarily reflect the Trust's views. Advice is always available from the Trust's staff.

I hope you enjoy this Journal.

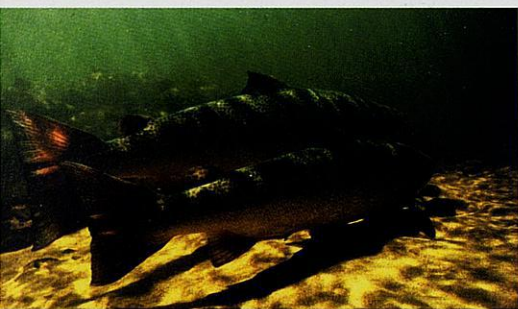
Seymour Monroe, Editor

From the Chairman

This has been an exciting year and one in which considerable progress has been made.

Bill Bewsher

This has been an exciting year and one in which considerable progress has been made. There have been very encouraging reports of many more salmon in our rivers and of greatly improved catches; indeed in some rivers the late summer and autumn runs have been almost prolific compared with those of recent years. No one knows exactly why this has been such a good year but undoubtedly improved smolt survival at sea and the reduction of mixed stock interceptory netting on the NE England coast will have been contributory factors.

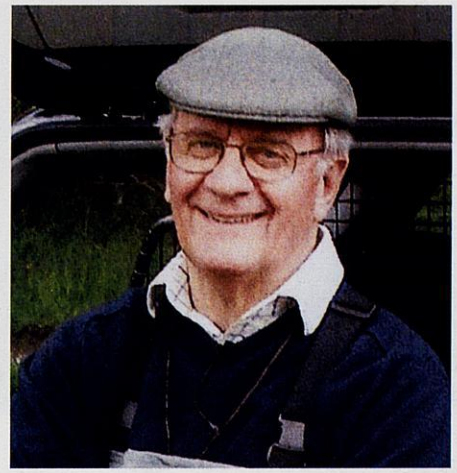


I want to highlight our allocation of £100,000 towards the Trust's current top priorities: research on salmon at sea and the restoration of salmon and sea trout stocks in rivers, especially on the West Coast of Scotland.

It is to be hoped that these greatly improved runs will continue but this is by no means certain. The Trust will continue to play its part in working to increase the numbers of salmon and sea trout in our waters but a better understanding of both fish, especially while at sea, remains the key to this objective.

So this year I want to highlight our allocation of £100,000 towards the Trust's current top priorities: research on salmon at sea and the restoration of salmon and sea trout stocks in rivers, especially on the West Coast of Scotland. This significant sum is the largest grant the Trust has ever made in its 37 year history. It is only proper that the River Boards and Trusts concentrate on their own catchment areas and that we focus on the more national and generic issues. The marine project is being led by Dr Dick Shelton, our Research Director; and it is described more fully in the Research Section of this Journal, on page 7. This major investigation into the behaviour of salmon at sea, in conjunction with the Scottish Executive's Freshwater and Marine Laboratories and the Norwegian Institute for Marine Research, leads naturally into the North Atlantic Salmon Conservation Organisation's (NASCO) 'Salmon at Sea' – SALSEA – project which should start in 2006. We are also supporting five other projects this year and details of those may again be found in the Research Section. Finally, I particularly want to mention the successful completion of the SALGEN project – see the article by Dr Eric Verspoor on page 9.

In addition to our various research activities, Dick Shelton and our Field and Research Biologist, John Webb, have been proactive with their advice and practical support. John Webb in particular has done a great deal of sterling work on West Coast river issues. Between them they make a significant contribution to fishery management across the spectrum from government committees to river biologists. Fishery management meetings are ever more frequent and the Executive Director, Seymour Monro, and Deputy Director, Tim Hoggarth, spend an



enormous amount of time championing the salmon and sea trout in committee rooms. Let us not forget that 2004 began with the publication of the report 'The Economic Impact of Game and Coarse angling in Scotland' which valued angling at £113 million per annum of which salmon and sea trout angling accounted for £73 million and which has underlined the importance of freshwater fisheries to the economy.

This year the Trust has begun to raise its profile and thus public awareness of its activities. Our allocation of £100,000 to research and the surrounding publicity helps this process. But we have also greatly improved our display at Game Fairs, re-vamped our website, distributed our 'blue books' free of charge, and cast our Postal Auction net wider in an effort to raise the number and variety of donations. This new-look 'Journal' is the first of many which will pass on more information in a more interesting and enjoyable style. All these things have been possible because the Trust has firm foundations: it has been consistent over the years in identifying the right priorities and for giving advice and support on the basis of sound research.

This year the Trust has begun to raise its profile and thus public awareness of its activities. Our allocation of £100,000 to research and the surrounding publicity helps this process.

The Trust remains keen to continue to allocate a high level of funds to research and other appropriate projects. To do this requires your support – especially your financial support – so please consider how best you can help us. I urge you to read the section on Fundraising, towards the end of the Journal – and to take action! I would especially like to thank most warmly all those who have been so very generous this past year.

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Finally, we have to bid some important farewells and welcomes. Our President for the last 21 years, the Duke of Wellington, has decided to stand down at this significant milestone. We are enormously grateful for his tremendous support and advice over these years and a full tribute appears on the following page. In his place we welcome the Duke of Westminster, who is a keen fisherman, a resolute conservationist and a most generous benefactor of the Trust. John Hopkinson moves from Vice Chairman, a post he has held with distinction for ten years, to become a Vice President. He is

replaced by Lord Guernsey. Michael Martin also retires and is replaced by Algernon Percy. I should particularly like to thank both of these retiring Directors for the time they devoted and the substantial contribution both made over a great many years to the affairs of the Trust. Jeremy Read, our former Executive Director, also retired earlier in the year in March. Both as Deputy Director and latterly as Executive Director, Jeremy worked tirelessly and conscientiously on the Trust's many and varied activities, and despite having no scientific background, his grasp and understanding of the many biological aspects of the salmon's behaviour was highly respected by all his contemporaries in fisheries management. The Trust is greatly indebted to all three of them.

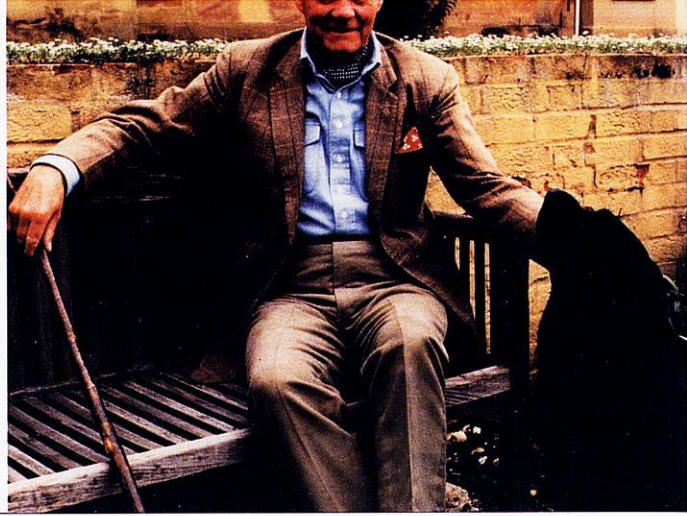
I should also like to thank our Executive Director, Seymour Monro – who has picked up the cudgels from Jeremy with great enthusiasm and has made an impressive start getting to grips with the increasingly complex affairs involving the Trust – Tim Hoggarth, our able Deputy Director, and the indefatigable Jenny Sample for all their endeavours in taking forward with commendable efficiency and good humour the many and varied aspects of the Trust's business.

I do hope you will enjoy this first edition of the Trust's new look 'Journal' which replaces the old Winter 'Report'. It has many interesting articles which give a real flavour of the terrific amount of work that is going on to improve the numbers of salmon and sea trout in all our rivers.

John Hoggarth

His Grace the Duke of Wellington,

KG, LVO, OBE, MC, DL



AST President 1983-2004

As indicated in the foregoing remarks, the Duke of Wellington retired as President of the Trust at the AGM on 7th December after having served 21 years in the appointment. The occasion was marked by a special luncheon and presentation in Fishmongers' Hall.

Valerian Wellington, the great-great-grandson of the illustrious Iron Duke, first became involved with the Trust in April 1980 when he accepted an invitation to join the then General Council. At that time a major fund raising initiative was being undertaken to which he lent his very considerable support.

The Trust's headquarters in those days was located at The Clock Tower, Farnham, Surrey and the move to Moulin did not take place until February 1986.

In October 1983, the Duke accepted an invitation to become President of the Trust and was formally appointed at the 15th AGM on 13th December 1983. Throughout his 21 years service the Duke presided with the greatest distinction over the Trust's many affairs and gave great support and encouragement to all its many activities, particularly those concerning mixed-stock interceptory fisheries, the adverse impact of

salmon aquaculture including misleading product labelling, as well as those involving the many important research projects being undertaken. His wise counsel and wide range of contacts have been of immense value and have been greatly appreciated by everyone in the Trust, past and present. We all owe him a great debt of gratitude and wish him a long and happy retirement.



Message from the Trust's Patron:

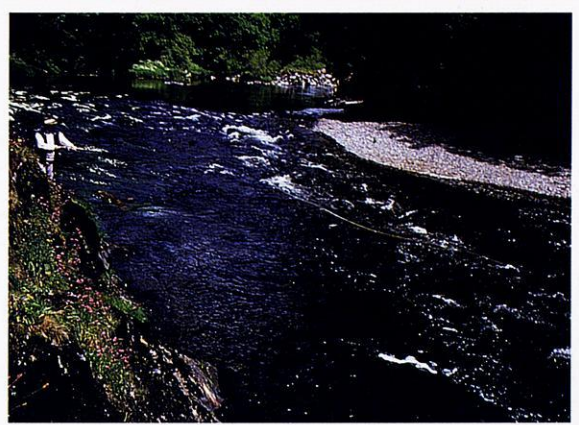
It gives me the greatest possible pleasure to be able to play a very small part in the celebrations to mark the extraordinary contribution which The Duke of Wellington has made to the Atlantic Salmon Trust. Although he might have served as President for twenty-one years, his involvement stretches back nearly a quarter of a century. Initially, he joined the General Council in 1980 and gave considerable assistance with a major fund-raising appeal which was underway at that time – and, in his typically generous way, he made Apsley House available for a splendid event which did so much to help the cause.

In October 1983, he was elected President. Although the appointment carries no executive authority, he has presided over the Trust's many affairs with the greatest possible distinction and I know that, in particular, he has been especially supportive of the continuing efforts – which are now showing real signs of success – to remove all mixed-stock interceptory netting around the coasts of the British Isles. He has also been a powerful advocate in the Trust's other great campaign to protect wild salmon and sea trout stocks from the harmful effects of salmon farming operations on the West Highland coast.

These are but two examples of the great contribution which the Duke has made to the Atlantic Salmon Trust and he will be sorely missed by us all. His contribution has been utterly invaluable and all of us who care about the future of wild salmon and trout, and the environment in which they live, owe him the greatest possible debt of gratitude.

HRH The Prince of Wales

The Sea Trout Symposium was a world first



River Wye

Tim Hoggarth, Deputy Director

Sea Trout Symposium 6-8th July, Cardiff University

The Trust was one of the main sponsors and formed part of the organising committee for this prestigious event which attracted some 180 delegates drawn from virtually every country possessing sea trout populations in its rivers. After three days of deliberations, the main outcomes of the symposium were that delegates:

- Formally identified the special importance of small streams and sub-catchments for the well being of sea trout which might not be included in the Water Framework Directive or reform of the Common Agricultural Policy.
- Expressed concern over both bird and mammal predation.
- Emphasised the threat from inshore commercial fishing operations.
- Specified the need to include sea trout issues in the forthcoming marine regulatory review.
- Specifically recommended that marine aquaculture should not be permitted until further research had been conducted to indicate ways in which the industry could operate without impacting on migratory fish.

Political Issues

The Trust continues to be concerned at the lack of progress with the introduction of a Fisheries Bill. Once again, The Queen's Speech in November made no reference to this issue. We are now drawing up a list of Peers, MPs and MEPs to include on our mailing lists with a view to eliciting their support in this matter. The lack of a Bill was also highlighted during the course of the River Fly Conference held at the Natural History Museum on 25th November:

As a result of a concerted campaign of lobbying and our input to the consultation on the draft Animal Welfare Bill, we have been advised that angling and fisheries have been excluded from the Bill's provisions.

Unity of Angling

Considerable progress has been made in establishing a company with Articles and a Memorandum of Association. As at the time of going to print it is likely that the company name will be "Fisheries and Angling Conservation Trust". Objectives similar to those for the Moran Committee, namely establishing a one-stop organisation for government to consult regarding fisheries and angling matters plus a new communications role. Membership will be based on the Moran Committee with two main levels identified by the needs of the Trust and financial contributions. Subscriptions for full members will be £1,000 pa, which will give an automatic place on the Board. Associate members will pay £500 pa, and may be invited to join the Board. The Atlantic Salmon Trust has opted for associate membership but has been guaranteed a place on the Board, which will be filled by the Deputy Director; in view of its importance as a

conservation organisation. Lord Moran will be the chairman and Jim Glasspool, who chairs the environment Agency's Southern region RFERAC, will be the vice-chairman.

Cormorants

As a direct result of the Moran Committee Bird Group's lobbying and after a series of meetings with Ben Bradshaw MP, the DEFRA Minister with responsibilities for fisheries, assurances have been given that there will be a relaxation in the licence application process to shoot cormorants. In particular:

- The presence of cormorants will now be proof enough of potential impact without the need to submit evidence of actual damage. (The precautionary principle.)
- Licences may be granted for 2 years.
- The season will be extended to 1st May.
- The number of birds which may be shot is raised from about 600 to 2,000 pa, which may be further increased to 3,000 if deemed necessary.

Scotland

The EU LIFE Award in favour of six Scottish rivers is a most exciting and significant achievement which will greatly enhance river habitats and water quality.

Seymour Monro, Executive Director

Management

An ever increasing amount of time is spent in committees of various shapes and sizes. This can be distracting, frustrating and even boring – but we have to be there or sometimes the wild fish are not properly represented. I am confident that we make progress!

The Freshwater Fisheries Steering Group meets monthly to consider issues which will be included in a new Bill to be put before the Scottish Parliament in 2006.

The Tripartite Working Group (TWG) meets biannually to discuss aquaculture and wild fish issues whilst its Restoration Sub-Group, meets three times a year to focus specifically on restoration issues. The Restoration Sub-Group has made it clear that there is no point in conducting restoration where there are badly sited fish farms and/or poorly run fish farms. It has urged the Scottish Executive to pursue relocation actively and to ensure Area Management Agreements and Codes of Practice are implemented expeditiously. It has also intimated its keenness to review and support any restoration plans or projects. John Webb remains a most constructive TWG Co-ordinator on the West Coast from Galloway to Sutherland.

The Fisheries Management Working Group (FMWG) is slowly dissolving itself now that the Rivers and Fisheries Trusts (Scotland) (RAFTS) has been set up. This over-arching organisation is a similar body to the English and Welsh Association of Rivers Trusts. The AST stands by to play its part.

An ever increasing amount of time is spent in committees of various shapes and sizes. This can be distracting, frustrating and even boring – but we have to be there or sometimes the wild fish are not properly represented. I am confident that we make progress!

Seals

Seals are, of course, one of the main predators of salmon and sea trout. Because they are seen to be round eyed cuddly beasts around our coasts, the public ignores or does not realise that they consume considerable quantities of salmon and sea

trout as they go to sea and as they return. It is difficult in the current climate to redress this imbalance in nature – caused largely by man – without the most convincing of evidence. Reports on specific research projects appear in the Research Section of this Journal. We are also maintaining close contact with the Sea Mammal Research Unit at St. Andrews and with the Moray Firth Group which is also studying seal behaviour and acceptable methods of dealing with seals which are seen to be taking salmon and sea trout. The intention of all this is to identify acceptable proposals to redress the current imbalance as quickly as possible.

EU LIFE Award

The EU LIFE Award in favour of six Scottish rivers is a most exciting and significant achievement which will greatly enhance river habitats and water quality.

The article by Andrew Graham-Stewart which appears on pages 18-19 explains it all. Our congratulations to those involved in bringing this bid to fruition.



River Grimsta

Research

The challenge for the future is to extend the principles of wise salmon husbandry . . . to the greater world of the sea.



FRS Scotia

Dr. Dick Shelton, Research Director

RESEARCH AT SEA IN 2005

The last thirty years have seen a revolution in our understanding of the lives of juvenile and adult salmon in fresh water. We now know how their demanding physical and biological requirements can best be met; we also understand enough about the structure of the stocks to safeguard the genetic integrity of the populations of salmon which together support the fisheries. That this knowledge is now increasingly being put to work in the rational management of both the fish themselves and of their habitats is good news indeed.

The challenge for the future is to extend the principles of wise salmon husbandry, which are serving us so well in fresh water, to the greater world of the sea. The urgency of the task is underlined by the fact that, over the same period that we have shown greater care in the management of our rivers and estuaries, the survival of salmon at sea has halved. For some populations, notably the early-running fish and those affected by poorly-run cage farms, levels of return are even worse.

There is general agreement among salmon biologists and oceanographers on both sides of the Atlantic that major, climatically-driven changes in the structure of shelf-edge ecosystems lie at the heart of the problems currently faced by stocks of salmon, cod and even migrating elvers. When fishery resources are limited by naturally-inclement conditions, it is essential that man does nothing to make a bad situation worse.

Now that the problem of directed fishing in sub-arctic waters has been addressed, action to end interception fishing in coastal waters

remains an important priority. It is also vital that migrating salmon be protected from inadvertent capture in surface fisheries for other pelagic species like mackerel and herring. Effective protection requires that we identify both the routes taken by the migrating salmon and the part of the water column they occupy at different times of day and night. The answers to both questions require research fishing by high speed trawl. The Atlantic Salmon Trust, working with scientists from the Norwegian Institute for Marine Research (Bergen) and the Freshwater and Marine Laboratories of the Scottish Executive's Fisheries Research Services will test just such equipment in the Faeroe/Shetland Channel (at the southeast end of the Wyville/ Thomson Ridge) in early June, 2005. For most of the time, the trawl will be fished without a cod end and information about the fish in the net will be transmitted to the ship (FRS Scotia) via closed circuit television camera. By this means, it will not be necessary to kill more young salmon than are strictly required for sampling purposes. It will also enable us to check on the presence of any returning adult salmon which might otherwise out-swim the net.

A more broadly-based international programme on the lives of salmon at sea will begin, under the auspices of the North Atlantic Salmon Conservation Organisation (NASCO) in 2006. This programme, which has been given the acronym, SALSEA, has many objectives but the primary one is to define the place of salmon in the pelagic ecosystem of the North Atlantic. The trials we will be undertaking in 2005 are the first steps for SALSEA, an initiative that the Atlantic Salmon Trust is glad to support.

Grant Aid Provided in 2004

The Trust's Honorary Scientific Advisory Panel met on 5th May and awarded over £12,000 towards the costs of three research projects: Seal Predation in Scottish Salmon Fisheries, the Scope and potential of Microsatellite DNA Markers and Targeted Electro-Fishing on the Cumberland Eden. These were described in last Summer's edition of *Scalereadings* and all the projects are under way and reports will be included in this Summer's Journal.

In addition to these three projects, the Trust's Board has approved a grant of nearly £7,000 to a study being carried out by Fisheries Research Services to identify seal predation levels upon sea trout. This involves the fitting of PIT tags to sea trout smolts and to seals at Shildaig.

The Trust has also made a grant of £1,500 to the Wester Ross Fisheries Trust to enable them to produce a report on their River Management Seminar held at Poolewe on 3rd and 4th December.

Grants for 2005

The Honorary Scientific Advisory Panel will consider applications for project support on 4th May. Invitations have already gone out and the awards will be announced in the Summer Journal. However, the Trust is always willing, where possible, to assist with projects in line with its current priorities and applications may be submitted throughout the year.

Biologist's Report

Restoration, co-ordination and advice on the West Coast of Scotland has been the priority.



John Webb and Ian McLaren, FRS, Faskally measuring fish on the Baddoch Burn

John Webb, Field and Research Biologist

Summary of activities in 2004

Conservation and Restoration Support Co-ordination – West Coast of Scotland

This year I have worked with the biologists employed by the Clyde Rivers Foundation, Loch Lomond Fishery Trust, Ayrshire Fisheries Trust, Wester Ross Fisheries Trust, West Sutherland Fisheries Trust and the Galloway Fisheries Trust.

The principal activities have included:

- Continuing liaison with West Coast Fishery Trust Biologists
- Continuing to provide information, advice and training support

A detailed report of my work was presented to Scottish Natural Heritage (a joint sponsor of the Co-ordinator's post) in February 2004.

Atlantic Salmon Trust Training

In November and December, training on spawning redd identification, counting, mapping and survey design was provided to biologists in West Sutherland, Wester Ross, Argyll, Ayrshire and Galloway Fishery Trust areas.

Atlantic Salmon Trust Advisory Service

The Trust's Advisory Service continued to operate in 2004. A total of 224 enquiries was dealt with over the period 1st January-1st December (inclusive).

This year also saw the biologist responding to a request from the World Wildlife Fund (Poland) to take a brief information and

advisory tour of the River Vistula. An article describing some of the highlights of the visit can be found on pages 20-21.

Meetings and workshops (January-December)

This year has seen attendance and participation in a number of meetings and public events. These included:

- International Symposium on Arctic Charr Conservation and Management.
- International Sea Trout symposium (Cardiff).
- Tripartite Working Group (Restoration sub-group meetings).
- Top Predators in Marine Ecosystems conference (Zoological Society, London).
- Scottish Fisheries Forum (Stirling).
- Ythan Project River of Life conference.
- Wester Ross Fishery Trust salmon and sea trout and river management symposium (Poolewe).
- Fisheries (Electricity) committee meetings.

Publications and conference papers

- In mid-January, I gave a presentation entitled 'Conservation and Restoration of West Coast Salmonid Stocks: towards the Development of an Advisory and Project Evaluation Support Framework' to a salmon restoration conference at Kenmore.
- A paper entitled 'Linking channel geomorphic characteristics to spatial patterns of spawning activity and discharge use by Atlantic salmon (*Salmo salar*)' by Moir, Gibbins, Soulsby and Webb, was published in the journal *Geomorphology*.

Advisory appointments

In late February, I was appointed as a member of the Fisheries (Electricity) Committee. The Committee is an Advisory Public Body constituted under the Electricity Act 1989. Its statutory remit is to advise and assist Scottish Ministers and any person engaging in, or proposing to engage in, the generation of hydro-electric power on any questions relating to the effect on fisheries or stocks of fish. The appointment will run for a period of four years. Further details of the Committee's work etc. can be found on the Scottish Executive's website (www.scotland.gov.uk)

Later in the year, I also accepted an invitation to become one of the scientific advisors to the new Kyle of Sutherland Fisheries Trust.

AST ADVISORY SERVICE

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SALGEN

Summary



Dr. Eric Verspoor, Conservation and Restoration Group, FRS Freshwater Laboratory

In 2000, the Atlantic Salmon Trust sponsored the European Commission funded SALGEN project to improve the integration of existing genetic knowledge into Atlantic salmon conservation and management programmes.

The SALGEN project, co-ordinated by Dr. Eric Verspoor of the Scottish Executive Fisheries Research Services Freshwater Laboratory, undertook to review comprehensively the latest genetic data in relation to population structuring and adaptive population differentiation in Atlantic salmon, and critically to assess its implications for the main scientific and management issues in stock conservation and rebuilding. The Atlantic salmon is one of the most studied and managed fish species, with thousands of published scientific papers describing various aspects of their biology, but the genetic character of the species remains largely a mystery to salmon biologists and managers. Yet this aspect of the species is central to survival and reproduction and needs to be understood and taken into account by them if they are to be in a position to consistently develop effective conservation and management programmes.

Under SALGEN, four workshops and a symposium were convened to review genetic research on the Atlantic salmon and its implications for species management in relation to key issues such as stocking, interbreeding with farm escapes and fisheries exploitation. Completed in 2004, the outputs from SALGEN encompass 12 primary scientific papers, four scientific review papers which provide up to data syntheses of genetic research and a technical book describing the implications of what is known of the genetics of the species for its conservation and management. The book, written at a level which will make it accessible for salmon managers and biologists, is due to be published early in 2005 by Blackwell Publishers.

Early in 2005, the Trust will publish an executive overview of the findings of SALGEN which will come out as a "Blue Booklet". This booklet, with the support of the EU, will be widely distributed among salmon managers, biologists, and policy makers to ensure that they are aware of the implications of the latest research on the genetics of Atlantic salmon. This will help the scientific insights gained by recent research into this aspect of species' biology, to be taken into account in the development of more effective conservation and stock rebuilding programmes.

Editor's note:

This is a most critical and important piece of work. Details of the book and 'Blue Book' summary publications will be advertised widely when finalised.

Shieldaig Sea Trout Project

The first five years towards restoration to previous stock levels.

David Hay and Maggie McKibben, FRS Freshwater Laboratory

Introduction

The Shieldaig research programme was set up in the late 1990's to try and understand the problems faced by sea trout on the West Coast of Scotland. Catches of sea trout had been declining for 20 or 30 years throughout the West Coast. As well as identifying any problems, the project also had the aim of restoring the sea trout population of the River Shieldaig. To allow the success, or otherwise, of these activities, a permanent fish trap was built at the mouth of the river to allow all fish entering and leaving the river to be counted and tagged.

Early steps

The first problem to be identified was sea louse infestation. Some of the sea trout smolts returned to the river within 2 or 3 weeks of leaving, many with substantial sea louse infestations. As the fish had become infected very quickly, the source of the problem was probably not far from the river mouth. Plankton sampling was carried out to look for infective sea louse larvae along the sea shore on either side of the river mouth. In 1999, the first year of sampling, high densities of sea louse larvae were found near the river mouth in spring, at the time sea trout smolts went to sea. When this sampling was repeated in 2000, no sea louse larvae was found.

Area Management Group

The study moved forward quickly with the formation of an Area Management Group for the Torridon area in 2001. Until then we were unaware of the levels of sea lice on the neighbouring fish farms at the time sampling was being carried out at the river mouth.



Fin clipping sea trout fry prior to stocking

Once we were able to exchange sea louse data with the fish farmers, the patterns of abundance in the samples started to make sense.

The local fish farms had a two-year production cycle with salmon smolts being introduced to the pens in the spring of the first year of the production cycle. These smolts had no sea lice on them initially, having been introduced from fresh water. It wasn't until the end of August that mature sea lice developed on these fish. From then on, until harvest at the end of the second year, variable numbers of sea lice were present. The fish were treated at intervals with medicines, which substantially reduced sea lice numbers for variable periods. Thus, in the spring, at the time of the sea trout smolt migration, there were no sea lice present on fish in the local fish farms during the first year of production, but every second year, sea lice were present.

Sea louse larvae were found at the Shieldaig river mouth again in 2001, a second year of fish farm production, and also at the mouth of a neighbouring river, the River Balgy. This additional site was included in the sampling programme to check whether the Shieldaig results were typical of other rivers in the area. A pattern seemed to be developing.

Irish research

In Ireland, research had shown that high levels of sea louse larvae could be found near river mouths, and lower levels could be found inside fish cages. However, the sea louse larvae quickly disappeared only a short distance from the cages and no sea lice were found in open water between the cages and the shore. They concluded, on the basis of this evidence, that sea louse populations were maintained by wild fish near river mouths, that fish farms became infected from this source, but that most sea lice in fish farms were retained within the cages, especially when the nets were partially clogged.

Open water sea lice Regular level

With our colleagues at the Marine Laboratory we started to look for larval sea lice in open water between the fish farms and the shoreline. The FRS research vessel *Clupea* undertook a series of tows and pumped samples over a four-month period during spring and early summer but largely drew a blank, which appeared to confirm the findings of the Irish study. However, at the end of the trial we bought a small inflatable boat, continued the sampling programme, and immediately started catching larval sea lice in open water between fish farms and the shore. The larvae were found very close to the surface, within the top metre. Perhaps the large displacement ship had just pushed aside this thin surface layer and the sea lice it contained.

On one occasion, after a sea louse treatment on one of the fish farms, a substantial

increase in sea louse numbers was recorded in open water, about half-way to the mouth of the Shildaig River; one week later. However, no sea lice were present in the river mouth samples. The following week, the highest density of sea louse larvae yet recorded appeared at the mouth of the Shildaig. Were these events connected? Sea louse larvae change into different stages as they grow older. By looking at the proportions of the various stages in the different locations it was shown that the youngest larvae were found near the fish farm, more of the older stages were found in open water and only the older stages were found at the river mouth. This was consistent with movement over time towards the shore. It also meant that the sea lice found at the shore could not have been born at the river mouth as none of the youngest stages were ever found there. But if they had come from fish farms, how had they got to the shore?



Sea trout smolts with sea lice

Hydro-dynamic model

Colleagues at the Marine Laboratory were looking for a site to trial a new computer model which could be used to predict the movement of particles in the sea. Torridon was an obvious choice as we already had many observations of the appearance of sea lice around the shore.

Larval sea lice are planktonic, so they are carried passively by the surface layers of the sea. When the computer model was run initially, using only tidal data, the predicted patterns of particle movements showed only very limited dispersal from fish farms, due to the backwards/forwards movements of the sea during tidal cycles. This could not explain the patterns of dispersal observed or the appearance of sea lice on the shoreline.

On the West Coast of Scotland the prevailing wind is westerly. When the effect of wind on the surface of the sea was added to the model, it predicted very similar dispersal patterns to those already observed in the open water and shoreline samples. During periods of westerly winds the model predicted the transport of particles from two fish farms to the adjacent river mouths, a distance of up to 4.6 km, over a 14 day



Shoreline lice sampling



Lice sampling in Loch Shieldaig

period. The model also provided an explanation of the increased densities of sea louse larvae observed on the shore. It showed particle transport at lower densities in open water followed by the accumulation of high concentrations of particles at headlands and on shorelines exposed to the wind.

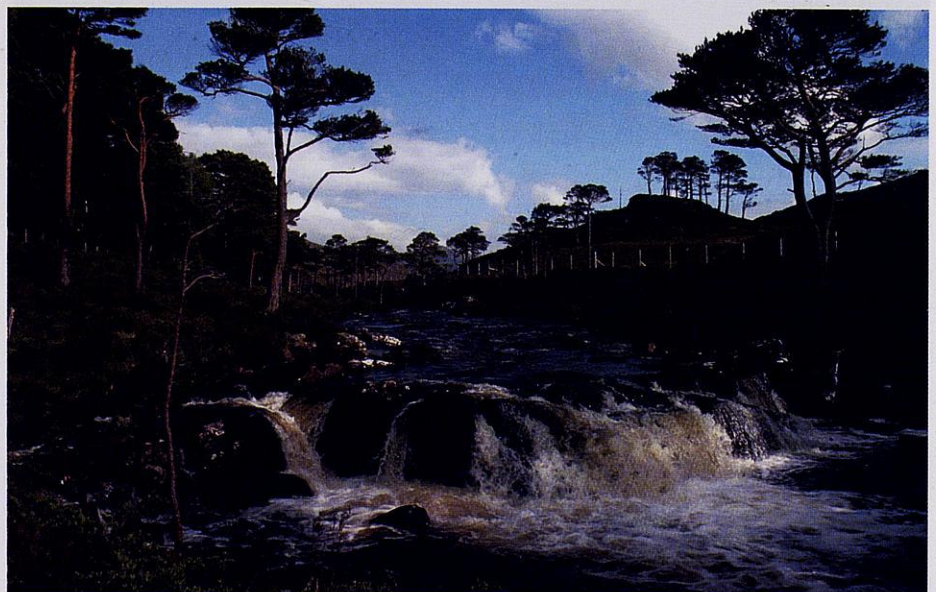
Year-round sampling

Shoreline sampling for sea lice was then extended from just the spring period, when smolts go to sea, to weekly samples taken year-round. This allowed comparisons with weekly fish farm sea louse data gathered over two years of production. As had been seen earlier, larval sea lice were never found at the river mouth when there were no sea lice present on the local fish farm. However, sea

lice were often found, but not invariably, on the shoreline, when gravid sea lice were present on the local fish farm. Both a source of sea lice and a transport mechanism seemed to be required. Statistical treatment revealed a highly significant correlation between gravid sea louse levels on the fish farm nearest to the Shielding river mouth and the appearance of larval sea lice in the shoreline samples 1, 2 and 3 weeks later, with the peak correlation after 2 weeks.

The current situation

The growing use of the most effective sea louse medicine SLICE and the synchronisation of treatments on all the farms in the AMG area has led to very substantial falls in sea louse levels on all the local fish farms. This has been reflected in the shoreline sea louse samples at Shieldaig where, for the first time since year-round sampling started, no sea lice were detected at the end of August, in a first year of production.



River Shieldaig



Fish trap on the Shieldaig

Restoration

The focus is now shifting to restoring the Shieldaig sea trout population. Throughout the study period, stocking has continued with 25,000 trout fry of Coulin origin added each year. Most of the sea trout smolts leaving the system, about 90%, are now of stocked origin. Enough information has been gathered to compare the return rates of stocked and

wild fish. Although the majority of the fish returning are of stocked origin, these fish do less well in the sea than their wild counterparts. So far the return rate of the stocked fish is only one third to one quarter that of the wild smolts. The next priority is to move towards stocking with wild fish and an initial population has been established at Almondbank for this purpose.

The future

If sea survival improves, it is hoped that the population of sea trout in the Shieldaig can be restored to previous levels, using the native stock. The Shieldaig restoration plan will be carried out as a trial of current restoration techniques and any lessons learned, both successful and otherwise, will be publicised as an aid to restoring fish populations elsewhere on the West Coast.

NASCO

Milestones and the future

Dr. Malcolm Windsor, Secretary, NASCO

The wild salmon brings many jobs, often to remote areas, and brings pleasure to those who fish it but also to many who will never fish it. It symbolises environmental quality. Over 2,000 salmon rivers flow into the North Atlantic and the wild stocks migrate widely. Rational management of the North Atlantic salmon can therefore be achieved only through international co-operation.

NASCO (the North Atlantic Salmon Conservation Organisation) is the international treaty Organisation founded to deal with international salmon issues. Since 1984, NASCO has provided that forum for conservation, restoration, enhancement and rational management of Atlantic salmon. It is now 20 years old and I thought I might first look back to what has happened. This period has proved a difficult one, since stock abundance has declined. Environmental changes, particularly at sea, may be having very significant impacts on abundance. In this situation, stringent management measures have been required on all factors that might impact on the resource. The milestones in the 20-year period follow:

- NASCO's Convention itself immediately prohibited fishing for salmon beyond areas of fisheries jurisdiction and in most parts of the North Atlantic beyond 12 nautical miles, and thereby created a large protected zone free of fisheries in the North Atlantic;
- NASCO successfully addressed the problem of fishing for salmon in international waters by non-Contracting Parties, such as Panama and Poland, but there is a need for vigilance as market demand for wild salmon could increase;
- NASCO agreements greatly reduced the interception by a Party of salmon originating in the rivers of other Parties. These fisheries accounted for 30% of the total harvest at their peak prior to 1984, but for less than 0.5% of the harvest in 2003;
- These NASCO regulatory measures stimulated management measures in 'home water fisheries' which have also greatly reduced harvests. There is a requirement under the Convention which effectively requires the process of 'putting your own house in order' before expecting others to make sacrifices;
- NASCO considerably broadened its base from an organisation which focused only on the fisheries to one which is now addressing a very wide range of threats to the resource (see below);
- NASCO introduced the concepts of the Precautionary Approach to all of its work so as to give priority to conserving the productive capacity of the resource and avoid irreversible change. In this regard, NASCO developed guidelines/agreements in relation to:
 - management of North Atlantic salmon fisheries;
 - habitat protection and restoration;
 - by-catch;
 - stock rebuilding programmes;
 - salmon aquaculture;
 - introductions and transfers;
 - and transgenics.
- NASCO identified all the social and economic values of the wild Atlantic salmon and developed guidelines on how to incorporate socio-economic factors in application of the Precautionary Approach without undermining its effectiveness;
- NASCO took steps to prevent the further spread of the parasite *Gyrodactylus salaris*;



Dick Shelton, Malcolm Windsor and Seymour Monro launching the marine research project.

- NASCO stimulated scientific research and advice to provide a basis for its actions;
- NASCO introduced a minimum standard for catch statistics, it has analysed the sources of unreported catches on an annual basis, and it has encouraged measures to minimise unreported catch;
- NASCO developed guidelines for catch and release fishing and for the establishment of gene banks;
- NASCO stimulated an exchange of statistics and information among the Parties and has established a number of databases related to the salmon and its conservation;
- Recognising that a major factor influencing salmon abundance is increased mortality at sea and that the causes of this are poorly understood, NASCO established an International Atlantic Salmon Research Board to stimulate research and links with NGOs and with the private sector on this issue;
- NASCO established a Liaison Group with the international salmon farming industry with a view to developing agreements on how to minimise impacts of this industry on the wild stocks;
- NASCO developed its transparency and admitted 30 observer organisations, a very much larger number than most fishery organizations, to its meetings. The contributions they make have been welcomed;

- In NASCO, over 100 delegates, all with differing experience and backgrounds in wild salmon, gather annually in a cooperative international spirit to do their best to conserve the wild stocks.

None of these elements existed prior to NASCO and not many international inter-governmental organisations have come this far in this timescale. Nonetheless, there can be no room at all for the slightest complacency. The situation for the wild stocks is still serious and the Organisation will now consider how to ensure its effectiveness for the next decade. One of the important things that we want to do is to seek the views of what we might call the "Stakeholders". By this we mean all those who depend on, utilize for recreation or livelihood, admire, get pleasure from or simply care about the wild salmon stocks. NASCO is calling this the "Next Steps" and we will hold two consultation meetings in January, one in London, UK, on 19 January and one in Portland, USA, on 25 January.

The situation for the wild stocks is still serious and the Organisation will now consider how to ensure its effectiveness for the next decade.

Clearly one of the central elements in future years will be to try to unravel the mystery of why salmon are dying at sea. For some monitored rivers, survival at sea is less than half the level it was 30 years ago. To better understand this phase of the life-cycle, and all the factors influencing salmon survival, is a huge challenge. Of course the underlying cause may be something that we can do little about, like climate change. Even being aware of that would, however, be of tremendous help in managing for the future. We are delighted to hear of the work at sea proposed by the Atlantic Salmon Trust, which will be part of a large international cooperative effort, SALSEA, on this subject. In NASCO we believe that only through international cooperation on this and all the other complexity of issues surrounding the wild salmon stocks, can we succeed in conserving this resource for future generations. They surely have a right to it too!

Editor's note:

Dr. Ken Whelan, elected President of NASCO in June, is a member of the Trust's Honorary Scientific Advisory Panel.

Dr. Richard Shelton, our Research Director is on the International Atlantic Salmon Research Board's Advisory Council.

The Atlantic Salmon Arc Project

Dr Dylan Bright, CBIol, MIBiol, Director of Science and Research,
Westcountry Rivers Trust, Project Director ASAP.

Atlantic salmon are an iconic species, the king of fish; they are a resource that underpins multi-million pound leisure and commercial industries. Paradoxically salmon are also members of a protected species that is in steep decline over most of its range, this decline is particularly acute in the southerly extents of its range.

There are many and varied reasons promulgated to explain this decline, some natural and some unnatural, however, it is *perceived* that marine exploitation is a significant factor exacerbating the decline.

Whilst marine exploitation continues, or at least, continues to be an unquantified factor, the costs and benefits of salmon conservation cannot be proven to be equitably shared; consequently groups of stakeholders will limit their resource allocation for salmon conservation until other groups of stakeholders show equal investment or restraint. A result of this *quid pro quo* approach to conservation is that the aims of conservation are never fully realised. This has been the result in other cases for other fish species where political negotiation over net size and age of capture have led to fisheries effectively postponing collapse rather than averting it. In short, the impact needs to be quantified for better or worse to allow informed and equitable conservation measures to be implemented at a precautionary level.

To achieve this goal managers need the capacity to identify salmon populations at sea, allowing them to apportion mixed catches between donor populations. It has long been understood by fishery scientists that information regarding the origin and the putative destination of Atlantic salmon is required for successful management of the marine phase of the salmon life cycle.

As mentioned this will allow:

- informed management towards sustainable exploitation based on the precautionary approach (run at the pace of the slowest);
- informed apportionment of the benefits of harvesting the resource between interests at sea and in the freshwater;
- informed apportionment of the costs of conserving the resource at sea and in freshwater.

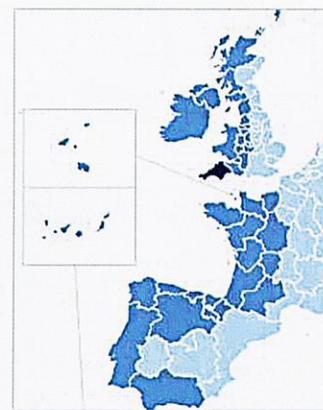
However, the scale of this issue is huge and transcends administrative, economic and political boundaries. To tackle the issue at the appropriate scale requires a wide cooperation between regions and countries, access to international funding mechanisms, and appropriate scientific methods. Until recently this was not feasible.

However, the increasing accessibility of European Regional Development Funding for Spatial Planning and improvements in the scientific methods of Genetic Stock Identification has now made this goal attainable.

In response to this rising potential the Westcountry Rivers Trust (WRT) with its expertise in fisheries and European funding, set about building a partnership with the task of delivering the goal of Genetic Stock Identification of Atlantic salmon in the North East Atlantic. As a result, in May 2004 the Atlantic Salmon Arc Project (ASAP) was officially launched. This project is worth 1.5 million Euros and is part of a European programme called Interreg IIIB, Atlantic Area. The partnership hails from across Europe and there are many associated partners who have helped significantly in the project development and delivery to date, too many unfortunately to list in full here.

The initial aim is to collect samples from the majority of salmon rivers on the Western Atlantic coast of Europe and use methods of Genetic Stock Identification (GSI) to effectively, genetically type salmon from particular regions and rivers across the Atlantic Arc Region as defined by the EU (see Map 1). Once this database of genotypes is assembled, it is hoped that

Towards the identification of salmon populations at sea.



Map 1. Eligible areas for the ASAP project.
WRT's base in Cornwall is highlighted

managers will be able to take fish caught at sea and quickly assess their river or region of origin.

The huge geographic scale of the genotyping undertaken in the ASAP project ensures that, when salmon are sampled at sea, we stand a good chance of getting a fish from, or from very nearby a genotyped population. The more genotyped populations there are the higher the probability of successful meaningful assignment and the more information for management. However, the exact level of spatial discrimination attainable for a study of this scale is not yet fully understood because levels of genetic differentiation vary within and among rivers. The geographical distance between populations explains some of the variation but it is also a result of historic and current ecological variables that are difficult to predetermine. Some rivers may have several distinct populations and in other cases whole regions may be occupied by one freely interbreeding population. This information has huge implications for our spatial description of meaningful salmon management units and is another potentially fascinating output from the ASAP project. These units will almost certainly not adhere to current political, economic and conservation boundaries.

Additionally, the database of genotypes compiled during the ASAP project could also be used for studies examining stock structuring during sea migration or macro scale adjustments of stock migrations year on year. Smaller scale studies on local mixed stock fisheries and peculiarities in the life history strategies might also benefit from using the database and protocols established during the ASAP project.

To achieve these exciting aims across the desired scale, one of the first things required is a standardised set of laboratory protocols and calibrations to maximise integration of the ASAP database with existing and future studies by different research groups. To address these issues, recently, Tim King, Eric Verspoor (leading salmon geneticists from West Virginia and Scotland respectively) and WRT co-convened a conference in West Virginia, attended by salmonid geneticists from around the world. The conference was a success and consensus was reached on several important technical issues and several exciting projects and collaboration will be taken forward as a result.

Another exciting outcome from this meeting was the decision by salmon geneticists covering the whole of the North Atlantic, to collaborate in a project to type populations genetically throughout the entire range of the Atlantic salmon using common protocols and share information through a common database. WRT was given a mandate to commence fundraising for this ambitious partnership project early next year. However, matched funding is still required for the successful delivery of the ASAP project and all stakeholders private and public that stand to benefit from the greater understanding provided by the ASAP project are being asked to contribute.

Editor's note:

Dylan Bright has recently been elected to the AST's Honorary Scientific Advisory Panel (HSAP).

Salmon conservation project in Scotland

Andrew Graham-Stewart

AGS reports on a milestone conservation boost for some Scottish salmon rivers

Whatever one's opinion of the European Union, most of us would agree that there are some areas of policy that it should leave well alone. Indeed the idea of Europe's politicians meddling in or holding sway over our salmon rivers is anathema. Mainland Europe's management of its salmon rivers over the past century or so hardly inspires confidence. Germany, France and Spain had some truly great rivers (the Rhine was once the most productive river in Europe with salmon averaging 17 lb) but a combination of uncontrolled pollution, systematic and unregulated netting and unsympathetic hydro developments has decimated the runs – often to the point of extinction. At best the survival of migratory fish runs in these countries hangs tenuously in the balance.

Given the foregoing, it is somewhat paradoxical that EU money is enabling what is the largest public/private sector partnership in salmon conservation ever undertaken in Scotland to proceed. The LIFE-Nature project, Conservation of Atlantic Salmon in Scotland (CASS), confirmed in August, has a total budget of £3.25 million. This is part funded (up to 50% for many elements of the programme) by the EU under the European Union's LIFE programme, which works to protect and restore threatened wildlife and habitats: it is in fact the biggest ever single public sector investment in salmon conservation. The project is being co-ordinated by Scottish Natural Heritage, in partnership with the Association of Salmon Fisheries Boards, participating fisheries boards

and trusts covering the rivers involved, and the Scottish Executive. It also involves an array of commercial partners including the Forestry Commission, Scottish Hydro-Electric and the Crown Estate.

Eight rivers will benefit. All are candidate Special Areas of Conservation for salmon under the European Habitats Directive – only rivers with this status are eligible for LIFE money. Whilst one can argue that these arbitrary designations are something of a lottery (many highly important salmon rivers are not members of this club), those that have this status and have elected to be part of the bid will, as a result of the funding package, be able to proceed with a range of very substantial conservation projects. The majority involve significantly increasing the amount of suitable habitat for adult salmon to spawn and for young salmon to grow in, with the aim of increasing the number of smolts going to sea. On all the participating rivers the project includes funding to raise awareness of the importance of salmon conservation amongst schools and the public. Below are the project details on a river by river basis.

TWEED

A fish counter will be installed on the Gala Water at the weir in Galashiels. This major tributary flows off the hills to the north-west. The counter will allow for the monitoring of migratory fish stocks including the timing and quantity of the runs. It will be operational for the 2005 season and will provide an excellent opportunity to compare the Gala Water with the Ettrick, which already has a fish counter.

Total costs: £35,000.

TAY

Scottish Hydro-Electric in conjunction with the Tay Board has drawn up a schedule of works between now and 2008, designed to improve access to key areas of the River Tay catchment vital to the production of spring salmon. The areas in question are all in the headwaters and the work will involve easing access in areas at the top of major tributaries including the Tummel, Lochay and Lyon.

Total costs: over £200,000.

SOUTH ESK

The Esk Board has drawn up an extensive schedule of works between now and 2007 to address serious habitat problems in eight miles of river in Glen Clova above Gella Bridge. This headwater area has suffered from over-grazing and flood damage with consequent silting and loss of bank foliage. Once a survey to identify the most affected sections has been carried out, these sections will be fenced off, reseeded and planted with native hardwood trees to provide shade and shelter. In addition there will be remedial work in commercial forestry plantations and improvements to existing flood prevention measures in Glen Clova. **Total costs: £140,000.**

DEE

Efficient fish passes will be constructed on five tributaries. This will afford adult salmon easy access to an additional 34 miles of spawning streams, representing a significant increase to the amount of suitable spawning territory. In addition many tributaries of the Dee have been degraded by years of dredging for agricultural drainage purposes. This has left featureless streambeds and uniform flow regimes. Around 30,000 square yards of streambed will be made fish-friendly through the introduction of "boulder beds".



River Spey, Grantown

Dee Board staff will carry out all this work by hand. Similar works carried out in the past have shown dramatic increases in juvenile salmon numbers.

In order to prevent overgrazing and thus improve bank stability and riparian biodiversity on tributaries, 22 miles of fencing will be constructed. Again similar works carried out in the past have been monitored, showing impressive increases in juvenile fish numbers. The project also includes provision for the installation and long-term maintenance of 199 silt traps at key locations to reduce the amount of silt entering watercourses in the middle and lower reaches of the Dee valley; excess silt damages both spawning and juvenile habitat. Finally 10 miles of stream bank will be sympathetically coppiced to alleviate intense over-shading by bankside trees. **Total costs: over £700,000.**

SPEY

The Spey Board has drawn up an extensive schedule of works between now and 2008, which aim to remove or ease 13 major man-made obstacles to salmon migration. These obstructions include distillery intake weirs, hydro-electricity dams, road culverts and bridge aprons, and, once eased, will enable salmon to access a further 20% of the Spey catchment. Three fish counters will also be placed in fish passes on the River Truim, Dullan Water and at Spey Dam to monitor runs of adult salmon. The work will involve collaboration between the Fishery Board and the owners of the obstacles, including Scottish Hydro-Electric, the Crown Estate, the Moray Council, Scottish Executive Roads Division, Alcan Aluminium UK Ltd and Diageo. **Total costs: over £650,000.**

MORISTON

The Ness District Fishery Board, working in partnership with Scottish Hydro-Electric, is to reopen an important area of juvenile salmon habitat on the River Moriston, one of the Ness system's main spring salmon producing rivers. The area in question, the River Loyne tributary, has been unavailable for juvenile salmon production since the Moriston system was harnessed for the generation of electricity in the 1950s.

The outlet at the Loyne dam is to be modified to allow a more constant flow of water in which juvenile salmon can thrive. In due course this nursery area will be stocked annually with young salmon. In addition the partners are to expend considerable funds on reducing physical barriers within the Moriston to minimise the potential risks to migrating smolts. A smolt trap will also be installed to monitor the progress of this programme.

Total costs: £250,000.

OYKEL/CASSLEY

(Note: the Cassley was recently added to the Oykel's candidate Special Area of Conservation designation)

The existing screens at the Duchally dam on the Cassley, which prevent smolts accessing the tunnel that diverts water from the upper Cassley to the Loch Shin and the Shin hydro-electric system, are to be replaced by Scottish Hydro-Electric. There have been concerns about the efficiency of the existing screens. The new screens are state of the art and self-cleaning. Some 350 salmon migrate upstream past the counter at Duchally to the high altitude headwaters above; this area is understood to be where many of the spring run spawn. Funds are also allocated

for buying-out netting rights in the Dornoch Firth. **Total costs: £400,000.**

BLADNOCH

The works incorporate essential monitoring and research programmes including water quality analysis, electro-fishing surveys and smolt tagging. All of this will further the understanding of Bladnoch salmon and their environment. A wide range of practical habitat enhancement works will be completed across important spawning and juvenile nursery areas. A hatchery programme focusing on spring salmon will be undertaken in the headwaters. The Forestry Commission Scotland and the Galloway Fisheries Trust have worked together to identify key fishless areas of the upper river that historically were important spawning areas for spring salmon and where careful restructuring of the present forestry should produce significant environmental benefits and a return of fish. In these same areas a trial using limestone gravels to combat low pH is proposed. Funds are also allocated for buying-out local netting rights. **Total costs: over £250,000.**

Inevitably there will be some who argue that the EU money should have been targeted at more deserving conservation and restoration projects – for instance on rivers on the west coast where salmon numbers have plummeted since the introduction of fish farming rather than systems where they are comparatively healthy. The fact is, however, that as indicated above, for better or worse the criteria of eligibility allows no such flexibility. EU LIFE Funding is only available to candidate Special Areas of Conservation.

Editor's note:

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Poland

Tour of dams on the River Vistula

John Webb, Field & Research Biologist, AST

In July I was fortunate to be invited by the World Wildlife Fund for Nature (Poland) to tour some of the main dams and fishpasses on the River Vistula. The Vistula was once one of the great salmon and sea trout rivers of Europe. It drains a catchment area of 190,000 square kilometres (74,000 sq miles) covering nearly half the total area of the country. To put these figures into a UK perspective, the catchment of the Vistula covers an area approximately 27 times the size of the

The Vistula was once one of the great salmon and sea trout rivers of Europe.

catchment of the River Tay. Originating in the south of the country, at Barania Gora (1220m) near the country's southern border, the river flows 1000km from the mountains to the great Polish plains passing through Krakov and Warsaw until it empties into the Vistula Lagoon and Gdansk bay of the southern Baltic sea. The basin catchment area consists of 83% farmland, 1.8% forest cover (approximately 82% of the original cover having been lost) and 11.7% urban and industrialisation. The river is also impacted by numerous dams and weirs – of which thirteen dams are of 15 metres height or greater.

... the early running Vistula sea trout were particularly large; casual examination of published details of a sample of 124 net caught fish taken in the autumn of 1951 shows that the average weight was 5.9 kg (13lb), with a few fish between 1.0 and 11.5kg (22-25lb)!

The river is home to 59 different species of fish (incl. 13 introduced), including species as varied as pike, zander, carp, bream, Danube salmon (*Hucho*), resident brown trout, grayling and catfish. However, up until about the 1970s, the Vistula was perhaps most famous for its runs of large sea trout and salmon. In the past, salmon entered the Vistula over two main periods. The first fish were the immature 'winter' fish that entered the river in the autumn and then spent the whole winter, spring and following summer before spawning 8-12 months after entry to fresh water. Typically, these fish returned to spawning grounds in the very upper reaches of the river situated as far upstream as 800-1000 km from the sea. The second and later group of migrants were the so called 'summer' races that entered the river in the same year that they subsequently spawned – usually located in the lower reaches of the river basin. Subsequent research by Berg (1935) and Zarnecki (1963) demonstrated that the run timing of sea trout and its population were broadly similar to the salmon. However, the early running Vistula sea

trout were particularly large; casual examination of published details of a sample of 124 net caught fish taken in the autumn of 1951 shows that the average weight was 5.9 kg (13lb), with a few fish between 1.0 and 11.5kg (22-25lb)!

My tour began with a visit to the huge Wloclawek dam and reservoir. The dam was built in 1968 and is currently the lowest dam on the river (674 km from the mouth) and therefore of crucial importance as a gateway for access to the great majority of the river system. The site's statistics are impressive; the dam is 1200m long and 19m high with an integral 12m wide navigation lock. The resulting reservoir is 57km long and stores 370 million cubic metres of water. The integral power station operates on an 11.3m head and has six Kaplan turbines with a maximum discharge capacity of 2,190m³ sec⁻¹. The dam also has 10 vertical sluice gates with a further capacity of 7,500m³ sec⁻¹. The combined capacity of the site is therefore about 10,000m³ sec⁻¹.

At the eastern end of the turbine array there is a fishpass. It consists of a 30-chambered pool/traverse (plus submerged orifices) unit with a discharge of about 0.94 cumecs. There are nine separate tail-water entrances to the pass set at 0.4m height differences. An additional 'attraction' flow (0.52m³ sec⁻¹) was discharged near the pass entrances by an independent supply pipe. When fully operational, the combined fishpass/attraction flow capacity was less than 1.5 cumecs – equivalent to less than 1% of the discharge emerging from the turbines, even at low summer flows. However, due to the collapse of the associated pipework, the attraction flow facility has not been operational for some time.



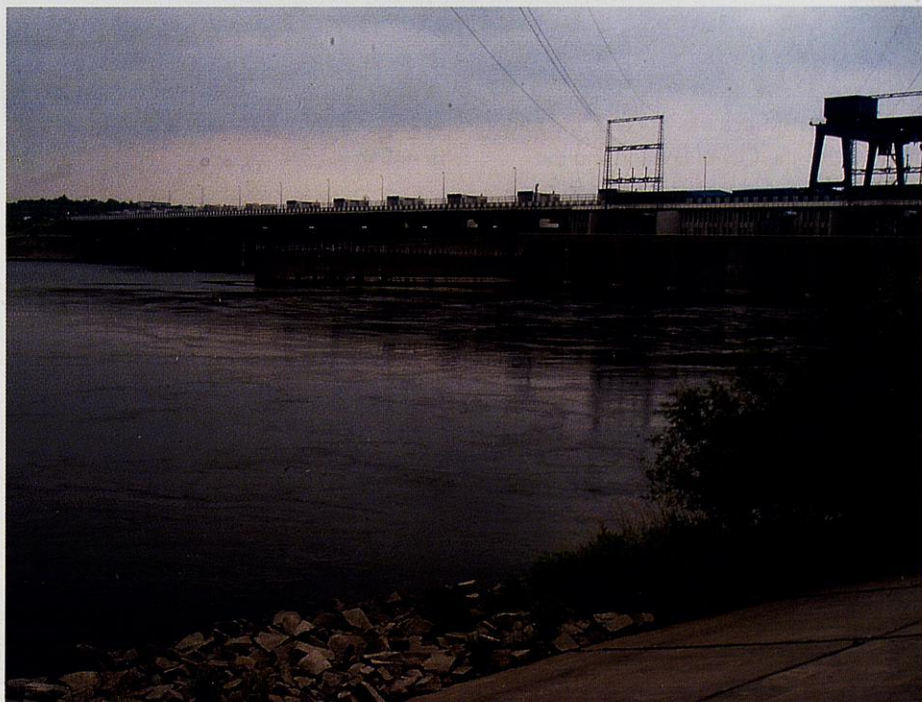
An upper tributary of the Vistula. This remote 'alpine' area near the country's southern border was once used by salmon and sea trout. However, access is now blocked by a series of high dams.

The importance of this single fishpass for salmon and sea trout cannot be overstated, as it represents the only means by which migrants can progress upstream and gain access to the great majority of the Vistula system. Because of the inefficiency of the fishpass, the dam complex at Wloclawek has nearly cut off access of winter running sea trout and salmon to the majority of the river system, and in particular the upper spawning grounds. As a consequence, the once famous large runs of fish that passed the area are now all but extinct. Migratory salmonids are now restricted to the main tributaries further downstream, in particular the Drweca River (which also has two dams) and its tributary the Brynica River.

My tour continued with visits to key sites on some of the main upper tributaries of the river. Particular attention was focused on the Dunajec River that rises in the Tatra Mountains on the border with Slovakia. This large, fast flowing river is impacted by a series of four hydro dams. One of the dams (Roznow) has an extraordinary fish pass that is 800m long. However, due to the height of the dam the mortality of smolts passing through the turbines has been shown to be 100%. It is difficult to imagine how planners could have gone to such lengths in designing and building such an enormous adult fishpass without considering whether juveniles might ever safely get to sea. Sadly, in the absence of a series of effective smolt bypass facilities the potential for restoration of runs of salmon and sea trout on the upper Dunajec is virtually zero.

Unfortunately, the problems that were so obvious at the Wloclawek and Rozow dams were not the exception to the rule. Many of the other dam sites that we visited raised a familiar suite of concerns about fish passage. Fishway entrances were often positioned too far away from power plant tailraces or overflows. At other sites, openings were too small, facing in the wrong direction or were effectively 'perched' above the normal waterline of stilling basin due to lowering of the river-bed (caused by erosion) downstream of the dam. In summary, many of the fish passage facilities appeared to have been designed with neither an adequate understanding nor due regard to the behaviour or basic migratory requirements of many species of fish. I passed on my detailed comments and advice.

A concerted effort is now being made by the World Wildlife Fund (WWF) to begin an attempt to ease the problems caused by the dams and reinstate large areas of the river's natural floodplain. WWF recently commissioned an Options Assessment for the Wloclawek dam. The report concluded that the dam presents a severe or complete obstruction to migration routes of many important fish species, many of which have now become virtually extinct upstream of the dam. WWF are now pressing for the development of a long-term and sustainable management strategy for the Vistula and its catchment.



Wloclawek dam. The multiple entrance fishpass is in the centre of the picture.

The Fishmongers' Company



Fishmongers' Coat of Arms

Keith Waters, Clerk to The Fishmongers' Company

The Fishmongers' Company, or the Worshipful Company of Fishmongers, as it is more formally known, is one of the most ancient of the London City Companies, one of the Great Twelve. The companies, or guilds, were an integral part of everyday life in the Middle Ages, existing for the common commercial good and social enjoyment of their members, all of whom were originally employed in the same class of business. Offering protection from the competition of outsiders while encouraging internal co-operation, they set standards for the quality of goods, oversaw the training of apprentices and gave financial assistance to Freemen of the company and their families in times of need. Those promoted to the Livery also played a part in the election of officers of the City of London.

The Fishmongers were granted their first Royal Charter by Edward I who came to the throne in 1272. This and subsequent ordinances bestowed on the Company provided them with a monopoly of the trade in fish within the City of London and the right to hold an independent court to settle disputes.

The Company also played an active role in the politics of the day. The Lord Mayor of London traditionally belonged to one of the Great Twelve Companies and, in 1381, William Walworth – one of the most famous Fishmongers of the Middle Ages – played a significant role in putting down the Peasants' Revolt. The dagger purported to be the weapon used by Walworth to stab Wat Tyler, who was threatening the life of the 14-year-old king, Richard II, is now on display at Fishmongers' Hall.

In the 16th century the Salt Fishmongers, dealers in wet fish, and the Stock Fishmongers, who traded in dry fish, were formally united. By this time Fishmongers' Hall had been established on land overlooking the Thames, near the medieval London Bridge. In 1666 the Hall was reduced to a smouldering wreck in the Great Fire. Pepys, who had attended many meetings there witnessed the fire and mentioned it in his diary. A new post-fire Hall was built shortly afterwards.

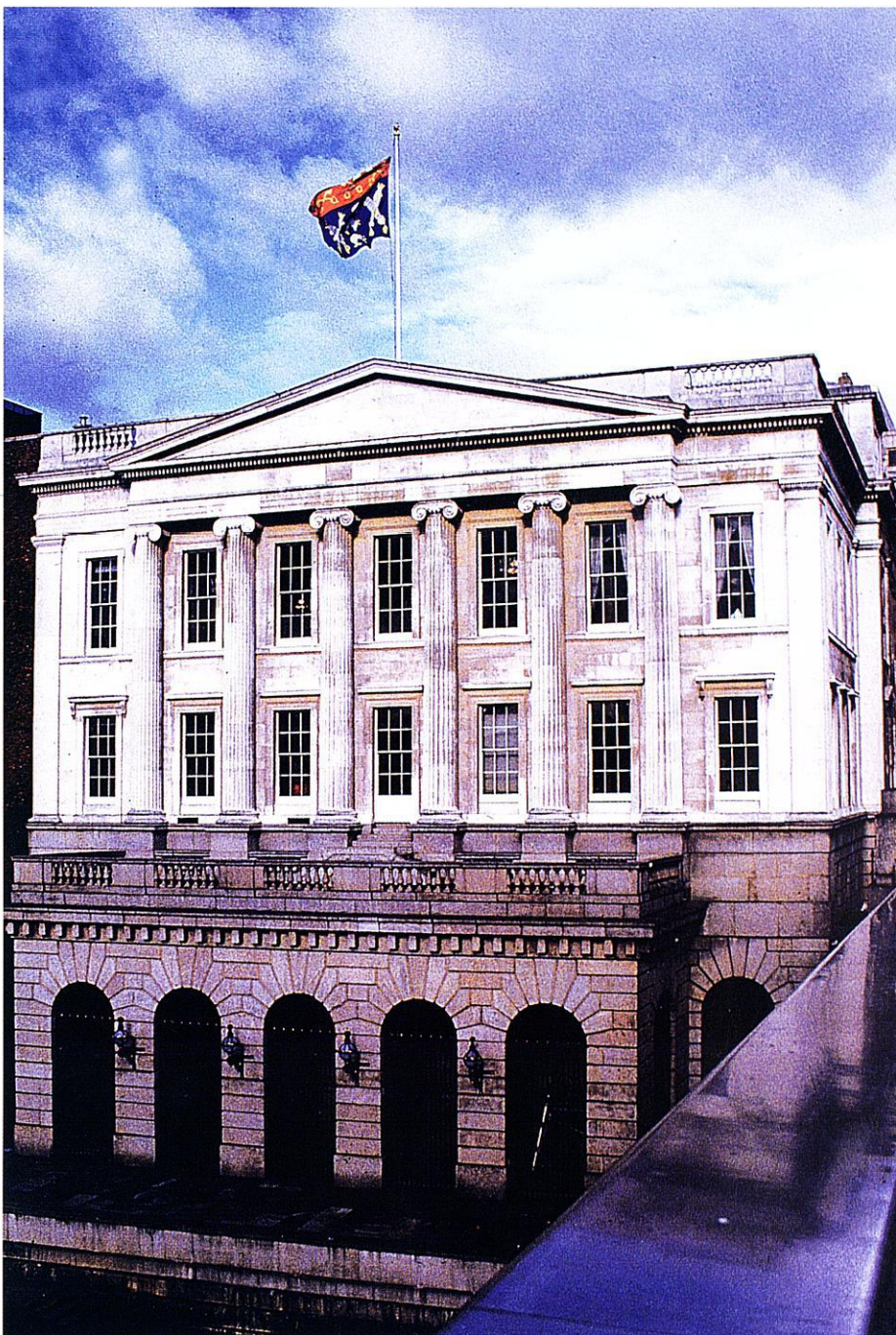
On the other side of London Bridge from Fishmongers' Hall stood Billingsgate Market which for centuries was considered London's 'larder door', being the prime location in the City for fishing boats to unload their catch. James I's Charter of 1604 gave the Company the right to search all persons 'selling, or having, possessing, or keeping to sell, any salted fish, salted herrings, fresh fish of the sea, salmon, stockfish, or any other fish whatsoever' and 'survey wether the same be wholesome for Man's Body, and fit to be sold or no'.

In 1827 the Fishmongers again experienced serious upheaval when their Hall was demolished to make way for a new London Bridge. The architect Henry Roberts, with plans for a building in the Greek Revival style, won a competition for the design of the new Hall. The exterior survives today as it was originally conceived with an arcaded granite base and the walls above faced in Portland stone.

After the outbreak of the First World War, the main floor of the Hall was used as a Red Cross hospital, but the building escaped damage. During the Second World War, however, it was set alight for a second time, by a German incendiary bomb. The damage was not as serious as in the Great Fire, however, and the Banqueting Hall was used as a British Restaurant, to feed the people of London.

The Company is involved to the present day in the business of fish and its inspectors still exercise the powers granted by Royal Charter at Billingsgate Market, which is now a low yellow brick building close to Canary Wharf. The inspectors are also appointed by DEFRA as British Sea Fisheries Officers to undertake work at Billingsgate, and the Company is mentioned in its own right as an enforcement body under various Acts. Since the late 19th century it has also employed staff in Scotland, until recently known as Inspectors of Salmon Fisheries. Currently the Company employs a Salmon Fisheries Co-ordinator whose remit extends across Scotland.

In addition, the Company has been instrumental over the years in helping to create many trade and representative bodies. In 1903 the Company founded the Salmon & Trout Association; in 1907 it formed the Oyster Planters & Merchants Association, later to be known as the Shellfish Association of Great Britain; and in 1967 it was a founder member of the Atlantic Salmon Trust. The Company also supports the Anglers' Conservation Association and other representative bodies.



Fishmongers' Hall

The value of the Company's financial and benefit in kind support to the trade, fisheries, fishing bodies and other similar organisations in 2004 is likely to be in the order of £800,000. This is a very significant investment annually by the Company, and it has been and continues to be the single most significant area of expenditure. During the course of the next twelve months a small working party of Liverymen has been tasked with looking into the value and effectiveness of the Company's support in the various areas. While this exercise may not provide immediate visible impact and results, in the long term the emphasis of the Company's support may well change.

In common with other Livery Companies, the Fishmongers' Company spends a large proportion of its resources in education and charitable giving. In education, the Company is proud of its long association with Gresham's school in north Norfolk, an outstandingly successful mixed boarding and day school offering an excellent all-round education. The City & Guilds of London Art School was saved from extinction in the early 1970s largely by Company members who incorporated a new charity to take over the assets and the running of the School from the City & Guilds of London Institute. The Fishmongers also support a large number of students on courses in schools, colleges and universities throughout the UK by means of scholarships, bursaries and grants.

A recent initiative by the Company's Chief Fisheries Inspector is the establishment of the Billingsgate Seafood Training School, founded to encourage interest in the fish trade and the cooking of fish. Courses are run for people employed in the retail and catering

industries, as well as for schoolchildren in the London area. In addition, from time to time, the Company's Executive Head Chef gives demonstrations of his gourmet fish dishes to special groups.

For many years the Company has had a tradition of making charitable donations and it continues to support a wide range of national or City of London charities concerned with the relief of hardship and disability, education, heritage, the environment and, of course, fishery related charities to which it gives priority. The Company also has two sets of almshouses, one in Bray (Berkshire) and the other in Hamletsham

(Kent), for the benefit of local parishioners and Freemen of the Company.

Hospitality and the promotion of good fellowship remain key features of the Fishmongers' Company. These days fewer Liverymen have a connection with the trade, but the Fishmongers' dinners still provide an opportunity to discuss matters of mutual interest in convivial surroundings.

Editor's note:

The Fishmongers' Company is a generous supporter of the AST. In addition they host our Annual General Meetings which are always followed by a delicious lunch!

Restoration of the River Carron

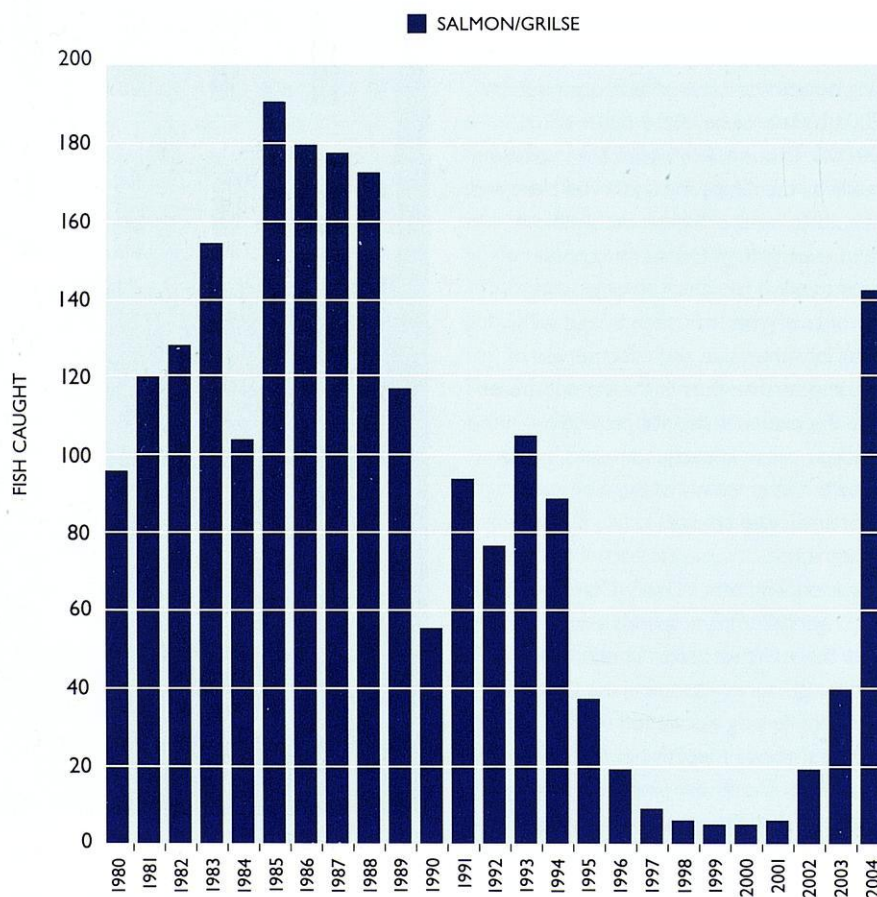
Bob Kindness, Seafield Centre

The River Carron in Wester Ross is one of the largest rivers in the West Highlands but, like many other rivers in this part of the country, it suffered a major decline in both its salmon and sea trout stocks during the 90's. Catches dropped to an all time low of 5 salmon, 1 sea trout and 1 finnock in 1999. The river as a fishery had died.

Various reasons for the collapse can be postulated but the end result was all too obvious. A lack of returning adults had led to a loss in juvenile production. Electro-fishing surveys carried out through the 1990's and evidence from anglers highlighted the problem. Since the quality of the habitat within the river was generally good, there was no reason why a healthy juvenile population could not be supported. Irrespective of the reasons for the stock decline, the one action that could be taken was to regenerate the numbers of young fish in the river thereby ensuring a reasonable smolt run. Without a smolt run there would be no possibility of getting adults back to the river. The answer was to instigate a restocking programme using appropriate stocks, at an appropriate level and adopting a suitable stocking pattern.

Broodstock programme

The first problem to solve was the choice of stock since gathering up wild spawning stock as a source of eggs was not an option. It was necessary to create a captive broodstock by gathering eggs from a number of wild fish and rearing a percentage of them through to full maturity thereby greatly increasing the potential egg production. This method was chosen in preference to catching wild parr or smolts since the original parents could be identified and disease tested and valuable



stock would not be removed from the river: In the case of sea trout, it was not possible to catch any from the Carron so it was decided to use stock from Loch Coulin (Ewe system) to create a broodstock. This was considered appropriate based on a major study carried out in 1936 and 1937 that compared large numbers of sea trout between Loch Doughail on the Carron and Loch Maree. Both types were considered to be very similar and could be described as a "standard West Coast type". Sea trout eggs were gathered in 1994 and 1995, with the help of FRS Freshwater Laboratory staff, to create broodstocks

whereby crosses could be made between the two year-classes. Salmon broodstocks were created in a similar way using original parents from the Carron. New stocks were added in subsequent years.

Separate facilities have been created for the broodstocks. Simple earth ponds are used for the sea trout, which are hand-fed daily (see photograph), while the salmon are kept in a combination of GRP tanks and rubber-lined rearing channels. Both broodstocks are kept entirely in freshwater.



Sea trout broodstock pond

Stocking strategy

The numbers of fish caught during the 30's study in Loch Doughail demonstrated the productivity of the Carron at that time. In two days netting in November 1937, 1,136 finnock and 411 adult sea trout were caught. Of the sea trout, 50 were over 7 lbs in weight and 1/3 were over 4 lbs in weight.

Egg deposition at that time would have been enormous and would be almost impossible to match with a stocking programme even if funds were plentiful. With this background and a relatively unchanged habitat, the policy adopted has been to stock as many fish into the system as possible and into as many locations as are accessible since the entire system was short of fish. As to the chosen life-cycle stage, in the absence of definitive advice, all the freshwater stages were chosen from eyed eggs to smolts. Since 1995, one million salmon and 1.5 million sea trout at various young stages have been stocked into the Carron.

Smolt releases

As part of the stocking strategy, a number of salmon S1 smolts have been released in each of the last three years (6,000 in each of 2002 and 2003 and 8,000 in 2004). Half of each batch has been treated with the anti-sea lice medicine Slice that will protect the migrating smolts for several weeks. All of these fish were tagged with CWT tags and adipose fin-clipped and were released through a specially constructed release pond.

Catch statistics

Although stock recovery in a river can be demonstrated through juvenile surveys, real recovery has only taken place when the number of returning adults increases and, perhaps, only when anglers' catches increase.

In the case of the Carron, rod catches can be used as an indicator of abundance of adult fish. Catch returns since 1980 tell the story (see charts for salmon, sea trout and finnock catches). The level of recovery has been as dramatic as the initial decline and has exceeded all expectations. The following facts should be considered:

- 1999 catch was 5 salmon, 1 sea trout and 1 finnock.
- 2004 catch was 141 salmon, 162 sea trout and 317 finnock.
- 5 year average for salmon up to 2001 was 6.2.
- 5 year average for salmon up to 2004 was 42.2.
- 5 year average for sea trout up to 2000 was 11.2.
- 5 year average for sea trout up to 2004 was 81.
- 21 fin-clipped salmon (from smolt releases) were caught in 2004.

The increase in catches has been year on year and is consistent with the hoped for, although perhaps not expected, effect of the stocking programme.

Relationship with salmon farming

Throughout the period of recovery of the Carron, two salmon farming companies have operated in the area, Scottish Seafarms in Loch Kishorn and Pan Fish (Scotland) at Strome in Lochcarron. The following is relevant when considering the possible interaction between the farms and the river:

- The farms produce a combined tonnage of over 4,000 tonnes.
- Sea lice are controlled on both sites by using Slice.
- Synchronisation between the two sites has only become possible from autumn 2004.
- No early returning post-smolts have appeared in the sea pools of the Carron during the last four years.



Bob Kindness with salmon broodstock

Restoration of the River Carron

- In a sample of 350 sea trout and finnock caught in the sea pools in 2003, a higher than background level of sea lice was recorded on only 2 fish. These were adult lice and did not equate to the local farms.
- Good co-operation has existed between the local farms and wild fisheries interests for several years, recently made more formal through an Area Management Agreement.

It would appear that the local salmon farms are having no adverse effect on the numbers of salmon and sea trout returning to the Carron.

Benefits of the stocking programme

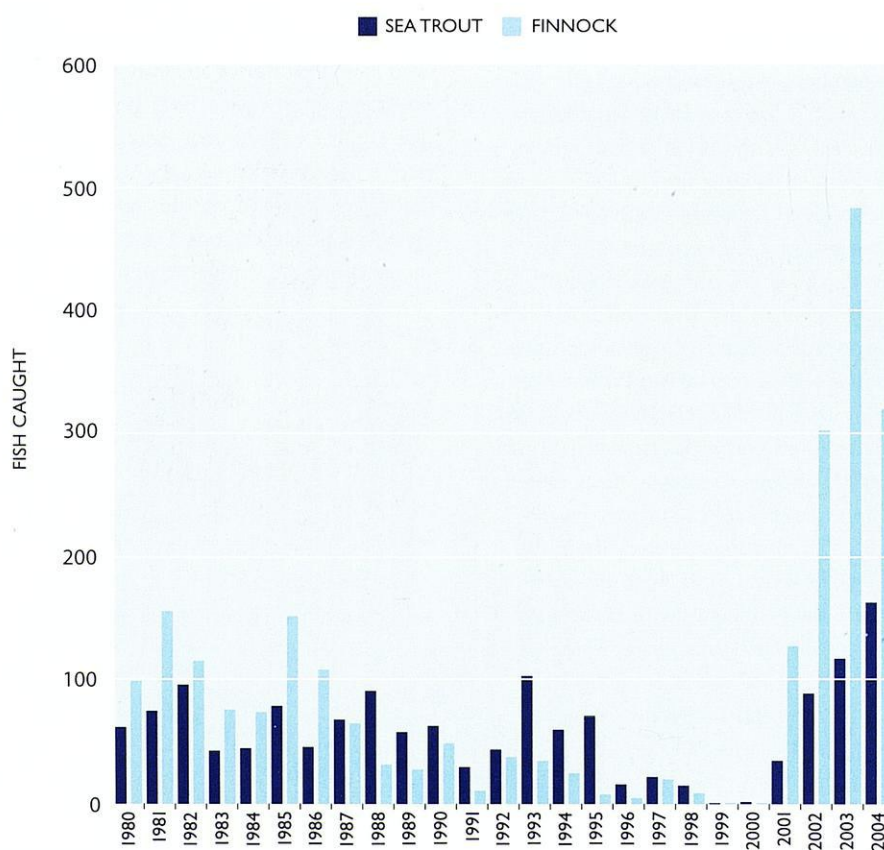
An obvious benefit of the programme has been the overall dramatic improvement in rod catches. This is exemplified by one party having their best week in 38 years of fishing the river while another equalled their previous best week which was in 1984.

Other benefits include:

- The number of fish spawning naturally will have increased greatly. This is helped by the fact that a 100% catch and release policy operates for both salmon and sea trout.
- The lower three beats have been made available to visitors on a cheap day ticket basis (149 tickets in 2004) making the river a real community asset.
- The biodiversity of the catchment is benefiting with the Carron now being one of the richest in the West Highlands both in and out of the water.

Conclusions

The fortunes of the River Carron as a fishery have experienced a remarkable turnaround and, although not completely back to its



former glory, it is certainly heading in the right direction. The reasons for the improvement would appear to be two-fold:

1. Rather than dwell in the past and argue about who is to blame for the decline in stocks, the Carron proprietors have taken the pro-active approach, through Bob Kindness, of regenerating the juvenile stocks in the river thereby re-establishing a smolt run. This has been done without necessarily rectifying the problem that caused the decline. If we were to wait until all the possible problems were ironed

out we would be waiting for a long time. There is little doubt that the stocking programme has been very effective.

2. Marine survival has improved to such an extent that the increased smolt run is generating a much improved run of adult fish back to the river. Without the improvement in marine survival, the increase in returning adults, as a result of stocking, would certainly have been more modest.

The nett effect is quite simple – the Carron has risen from the dead and come back to life.

Scalereadings

Activities

Trust staff – in addition to normal management and field biology activities – have attended AGMs and fairs and visited rivers, hatcheries and hydro schemes countrywide. It is vital that we continue to do so to keep in touch and to spread the word. Our thanks go to all those who have hosted us and briefed us.

Game Fairs

The venerable caravan has been pensioned off and so the Trust had a tent at Scone, Blenheim and Moy. The S&TA kindly let us have a very prominent part of their display area at Blenheim. We also had a small display at the Scottish Countryside Alliance's Fair at Glamis. Dates for 2005:

GCT Fair; Scone 1-3 July

CLA Game Fair; Belvoir 22-24 July

Highland Field Sports Fair; Moy 5-6 August

Countryside Alliance Fair; Glamis 3-4 September

Help from supporters at these events is always welcome! Please let us know if you are able to do so.

Postal Auction

As this Journal goes to press the final bids for the 2005 Postal Auction will be coming in. This was the first year that invitations were sent out to potential non-fishing donors: hotels, tackle shops and others directly or indirectly connected. It was also the first time that it was posted on the web. It is the intention to make the 2006 Auction even more attractive. If you would like to contribute, but don't currently receive an invitation, please make contact.

Publications

Please note that nearly all our publications now come free of charge – yes, FREE! Where postage comes to more than £5 we ask for the excess to be paid.

Communications

We have re-vamped our website – www.atlanticsalmontrust.org – and we have changed our e-mail to: director@atlanticsalmontrust.org or jenny@atlanticsalmontrust.org

Tim Hoggarth's e-mail is: tim-hoggarth@countryside-alliance.org

Trust Publications

The following publications are available from the Trust's office. Most are free of charge – we'd rather they were read than gathered dust on our shelves!

The Biology of the Sea Trout

E.D. Le Cren

(Summary of a Symposium held at Plas Menai, 24-26 October 1984)

Salmon Stocks: A Genetic Perspective

N.P. Wilkins

Salmonid Enhancement in North America

D.J. Solomon

Salmon in Iceland

Thor Gudjonsson and D.H. Mills



Game fair images

Scalereadings

Atlantic Salmon Facts

D.H. Mills and G. Hadoke

(Revised May 2003 by R.G.J. Shelton and J.B.D. Read)

The Atlantic Salmon in Spain

C.G. de Leaniz, A.D. Hawkins, D. Hay and J.J. Martinez

The Automatic Counter – a Tool for the Management of Salmon Fisheries

A. Holden

(Report of a Workshop held at Montrose, September 1987)

Salmon in Norway

L. Hansen and G. Bielby

A Review of Irish Salmon and Salmon Fisheries

K. Vickers

Water Schemes – Safeguarding of Fisheries

J. Gregory

(Report of Workshop at Lancaster)

Genetics and the Management of the Atlantic Salmon

T. Cross

Fish Movement in Relation to Freshwater Flow and Quality

N.J. Milner

Acidification of Freshwaters: The Threat and its Mitigation

R. North

Strategies for the Rehabilitation of Salmon Rivers

D. H. Mills

(Proceedings of a joint Conference held at the Linnean Society in November 1990)

Salmon Fisheries in Scotland

R. Williamson

The Measurement and Evaluation of the Exploitation of Atlantic Salmon

D.J. Solomon and E.C.E. Potter

Salmon in the Sea and New Enhancement Strategies

edited by D.H. Mills

(Proceedings of the 4th International Atlantic Salmon Symposium, St. Andrews, New Brunswick, June 1992)

Surveying and Tracking Salmon in the Sea

E.C.E. Potter and A. Moore

Automatic Salmon Counting Technologies – A Contemporary Review

G.A. Fewings

Salmon in the Dee Catchment: The Scientific Basis for Management

A. Youngson

(Proceedings of a one day meeting held at Glen Tanar House, 13 October 1994)

Spring Salmon

A. Youngson

Enhancement of Spring Salmon

edited by D.H. Mills

(Proceedings of a one day Conference held at the Linnean Society of London, 26 January 1996)

Water Quality for Salmon and Trout

J. Solbé *(second, revised edition)*

Salmon Fisheries in England & Wales

W. Ayton

The Industrial Fishery for Sandeels

A.D. Hawkins, J. Christie and K. Coull

Habitat Restoration for Atlantic Salmon

David W.J. Smart

The Interpretation of Rod & Net Catch Data

edited by R.G.J. Shelton

(Proceedings of a Workshop held at the Centre for Environment, Fisheries & Aquaculture Science, Lowestoft, November 2001)

Predation of Migratory Salmonids

(Assessment of a Workshop held in Edinburgh on 11-12 April 2000, the Chairman, Professor Fred Last OBE)

We also have copies of Dick Shelton's book 'The Longshoreman – a life at the water's edge' at a discount price.

Other items such as ties, prints and posters are also on sale at Game Fairs and from the Trust's office:

Moulin, Pitlochry, Perthshire PH16 5JQ

Telephone: 01796 473439

Fax: 01796 473554

E-mail: jenny@atlanticsalmontrust.org

Web: www.atlanticsalmontrust.org

Book Review

Andy Walker, FRS Freshwater Laboratory

"UPON A RIVER BANK" by DEREK MILLS

Sitting here beside a mountain creek full of cutthroat trout in western Wyoming, on the edge of Yellowstone National Park, it seems particularly fitting to be writing a review of this delightful little book on angling memories by Derek Mills. Dr Mills is one of the 'heavyweights' of salmon biology and fishery management and a long-serving committee member of the Atlantic Salmon Trust. The book mainly comprises short, graphic descriptions of fishing trips, usually highly successful ones at that, to rivers, but also lakes, throughout the UK, Ireland, Iceland and Austria. We fish for Atlantic salmon, sea trout, brown trout, Arctic char; American brook char; rainbow trout and there is even a piece on sea angling in Wester Ross. Fascinating, often hilarious, historical accounts, and frequent quotations of matters piscatorial, are cited from the works and lives of John Buchan and Sir Walter Scott. There is also an excellently researched and entertaining chapter on the history of angling clubs in Scotland, dating back to the birth in 1829 of the Ellem Fishing Club in Duns, Berwickshire. How angling has changed and yet has so many of the same old concerns.

Several of the places where Derek has fished are ones where I also have had the good fortune to wield a rod, which adds a certain piquancy, but what I found especially impressive was Derek's recollection of the details of the trips, presumably aided by a good diary. My own diary keeping, like my memory recall, fell by the wayside. Not that my memory has gone completely, but the people who ask me questions often move on before the answers arrive. Anyway, what was I saying? Quite clearly, Derek has learnt more

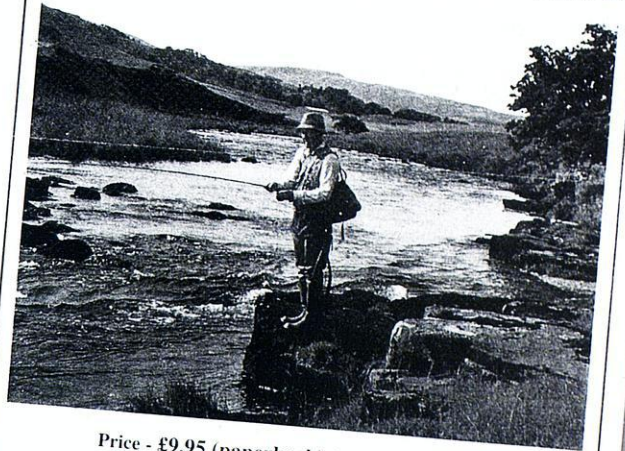
than a thing or two over sixty years of angling since his boyhood spent fishing in the Yorkshire Dales. Working much later as a fishery biologist in the north of Scotland, he describes some notable personal achievements with a salmon rod. Supreme among these accounts is his capture on fly of twelve fine spring salmon in a day on the Black Water, a tributary of the River Brora. This was back in the heady days of spring plenty, when anglers were true hunter-gatherers and could come home, as Derek puts it, "with comb erect." Now about all we have to offer are a few flabby put-and-take rainbow trout that could have been "gathered" much more cheaply from a fishmonger! And if you do hook a salmon, the chances are that someone will ask whether you are going to put it back.

Some of the chapters are based on articles written originally for the Journal of the Flyfishers' Club and now may seem dated with their references to "braces" of trout or grayling and "pulling the stumps" at the end of the day. Angling literature, like the sport itself, has changed gradually over the years. However, 'Upon a River Bank' reminds us repeatedly of core, traditional angling values. I found it absorbing in many ways. Far from being a nostalgic book, dealing mainly with the mechanics of the sport and tales of derring-do, it is packed with interesting biological and ecological observations and with poignant and pointed historical information. It is actually a warm appreciation of the total environment of angling.

UPON A RIVER BANK

DEREK MILLS

"Upon a River Bank" presents the reminiscences of a salmon and trout angler over a period of sixty years giving accounts of fishing in Austria, Iceland, Ireland and the United Kingdom. The author also includes a number of amusing chapters on fishing exploits by characters portrayed in the novels of John Buchan and Walter Scott. It is further spiced with a description of the hilarious activities of Scottish angling clubs. His accounts are enlivened with colour photos of fish, river scenes and waterfowl. Derek Mills is a well-known salmon biologist, fishery expert and academic and has produced a number of books on salmon and the marine and freshwater environment. He serves on the committee of the Atlantic Salmon Trust and is a member of the Flyfishers' Club.



Price - £9.95 (paperback) (ISBN 1-904784-01-1)
£ (deluxe leather-bound limited edition
of 50 numbered copies signed by the author)

Can be ordered from any good bookseller or direct from:
Coch-y-Bonddhu Books,
Machynlleth, Wales SY20 8DJ (Tel: 01654 702837; e-mail: paul@anglebooks.com)

The book, which is photographically illustrated and published by Derek Mills, is available in paperback (£9.95) or leather-bound in a limited edition, from any good book seller, or direct from Coch-y-Bonddhu Books, Machynlleth, Wales SY20 8DJ (Tel: 01654 702837; Fax: 01654 702857). Unfortunately, in my copy, Chapter 23, 'The Beginning', is repeated. No doubt this will be corrected in a second edition.

Advertisements

If you would like to advertise in the next issue of the Journal, please contact Jenny at Moulin by Telephone on 01796 473439 or by Fax: 01796 473554 or email: jenny@atlanticsalmontrust.org by the 1st of May. Quarter, Half and Full page sizes available.

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Fundraising

To maintain and increase our level of support to research and other projects – we urgently need your support!

The Atlantic Salmon Trust is a charity and receives no public funding whatsoever. It relies entirely upon contributions from supporters whether corporate or individual.

- The Trust has only three full-time and two part-time staff. Some of their salaries are met directly by generous donors. Administrative costs are kept to a bare minimum.
- Thus the majority of the funds go towards support to specific research or improvement projects and to giving management advice.
- In this Journal you can see what our current priorities are. Over £100,000 has been allocated so far for the period up to March 2006. More will be awarded to fresh projects at the Honorary Scientific Advisory Panel Meeting in May 2005.
- **TO MAINTAIN AND TO IMPROVE THIS LEVEL OF FUNDING WE NEED YOUR SUPPORT.**
- Please donate and encourage others to do so. If you do so already – our sincere thanks.
- We are not a 'membership' organisation, we have 'supporters'.
- As a 'supporter' you can help by:
 - Making a Gift Aid donation, on which the Trust can reclaim income tax. A form including a Bankers Order for regular donations (which allow us to plan our budget) is overleaf (we suggest a minimum amount of £30pa).
 - Making a gift of listed shares to the Trust. You can claim income tax relief on their value, and will be exempt from any capital gains charges.
 - Remembering the Trust in your Will – a bequest will be free of any inheritance tax.
 - Contributing to our annual postal auction.
 - Sponsorship of the Trust or of a specific project.
- Becoming a 'supporter' will secure you a place on our mailing list for the Journal, access to our publications and catalogues **and the knowledge that you are supporting a most worthwhile cause.**

Please complete the form overleaf. Further advice can be given by our Finance Director, John Gray.

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THE ATLANTIC SALMON TRUST – GIFT AID DECLARATION

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- You must be a taxpayer to make a valid Gift. The total of income tax and capital gains tax payable by you in each year must be at least equal to the tax recoverable on all your Gifts.
- For every £1 donated under Gift Aid, the Atlantic Salmon Trust can recover a further 28p.
- Higher rate tax relief can be claimed by you on Gift Aid Donations.
- A Declaration can be cancelled at any time by notifying us. It must cease if you no longer pay tax.
- Instruction (b) above means that any further donations that you make will qualify as Gift Aid donations for as long as you wish.
- **To make a series of donations, which will be of great help in allowing the Trust to budget for work in future years, please complete the Banker's Order below and Instruction (b) above.**

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(Scottish Quality Salmon)
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