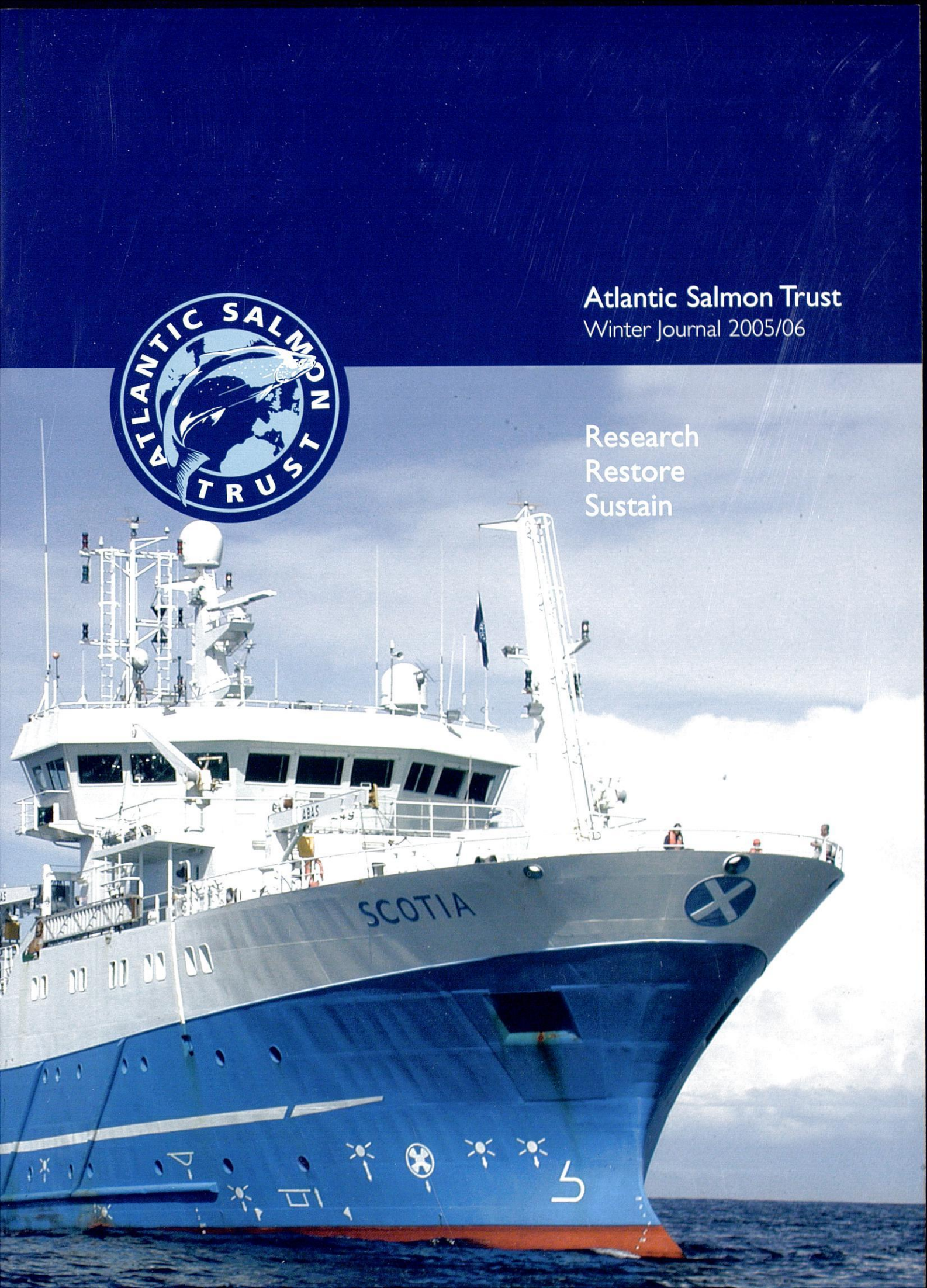
Atlantic Salmon Trust

Winter Journal 2005/06

Research
Restore
Sustain



WHAT IS THE TRUST?

- Founded in 1967, the Trust is an Atlantic-wide UK based 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 nets
- Improvement of fish farming codes of practice
- 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.

Moulin, Pitlochry
Perthshire PH16 5JQ
Tel. 01796 473439
Fax. 01796 473554
E-mail. director@atlanticsalmontrust.org or
jenny@atlanticsalmontrust.org or
tim-hoggarth@countryside-alliance.org
www.atlanticsalmontrust.org
Registered Charity No. 252742

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JOURNAL DATES
Summer Edition:
Contributions by 1st May
Published late June
Winter Edition:
Contributions by 1st December
Published late January

Photographs:

Covers:
FRV Scotia trawling the revolutionary new gear, Jens Christian Holst

Other photographs:
Andrew Graham-Stewart, Seymour Monro, Dick Shelton, John Webb.

The Journal is for many the 'shop window' of the Trust. I am confident that the contents demonstrate just how involved the Trust is in so many areas which affect salmon and sea trout. Some issues take a frustratingly long time to resolve, but we will keep working away at them. Research and restoration projects by their very nature are long term, but we will continue to increase our efforts to support them.

The highlights of the past six months have been the inaugural marine research cruises to find out more about the lives of salmon at sea. This is ground-breaking, revolutionary work and the Trust, along with its partners in the Scottish Fishery Research Services and the Norwegian Institute of Marine Research, is leading the way in this critical quest for information. Do read Dick Shelton's fascinating article which starts on page 12.

Our relatively new President and our new Chairman both write for the first time in the Journal. Two regular features also make their inaugural appearances: Andrew Graham-Stewart's review of this year's fishing in Scotland, and Claire Macdonald's 'Fishy Dishes' offers delicious suggestions for the fruits of people's efforts on river and loch.

There are many other articles which I hope you will enjoy. I am always on the lookout for interesting material including photographs – do not hesitate to come forward if there's something you would like to be considered. I am also keen to find reviewers of fishing in England, Wales and Ireland – any volunteers?

Seymour Monro

Seymour Monro, Editor

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

From the Chairman

I have for some time held the view that management of salmon fisheries should be founded upon three principles; scientific knowledge, common sense and, inevitably, politics.

Robert Clerk

A passionately keen angler for as long as I can recall, I caught my first salmon in April 1958 at Bemersyde on Tweed. To this day I still have a vivid memory of the many spring fish that were to be seen head and tailing in that very pretty part of the river at that time. One day, I am sure, we will see runs of spring salmon restored to the strength of those days but it will take time. Much later in life I had the good fortune to find myself working from an office not far from the Spey and through this started a long and fascinating involvement with the management and politics of salmon fisheries.

From experience as a member of various District Salmon Fishery Boards, the Salmon Advisory Committee of the 1980s and the Salmon Strategy Task Force of the 1990s, I have for some time held the view that management of salmon fisheries should be founded upon three principles; scientific knowledge, common sense and, inevitably, politics. It is the role of the Atlantic Salmon Trust to see that at the very least the first of these three tenets is made available and wherever possible applied by fishery managers.

It is a very great privilege and honour that I should have been asked to take over from Bill Bewsher the Chairmanship of the Trust's Board of Directors at this time and I am extremely fortunate that I should be doing so when the Trust is in such good heart and is at the forefront of so many important issues. In his ten years as Chairman Bill has achieved a great deal. Our corporate structure has been revised and we have a new Executive Director; deliberate decisions have been taken to raise the Trust's profile and we have committed more funding to research projects than ever before. Already we are seeing signs that adoption of this policy is paying dividends as we have benefited from some wonderfully generous financial support in recent months.

Promotion of research and the adoption of sound scientifically based best practice in the management of salmon fisheries is the *raison d'être* for the Atlantic Salmon Trust.

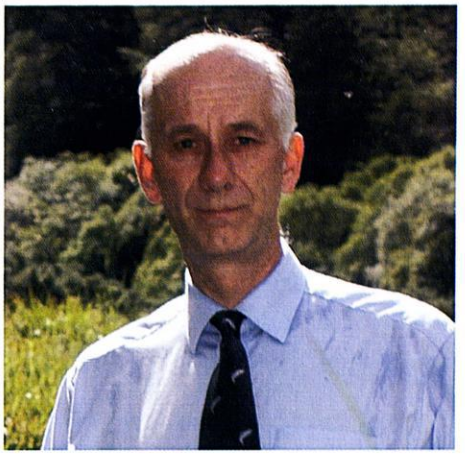
The past six months have been busy and both Seymour Monro and Tim Hoggarth have covered many miles representing the Trust at many committee meetings, visiting fisheries and research establishments, to say nothing of manning stands at Game Fairs ranging from Inverness-shire to Derbyshire. The Trust is very fortunate to have such committed and enthusiastic staff and we are very appreciative of their sterling efforts.

In his contribution to the last Journal Bill Bewsher referred to the decision taken by the Board of Directors to focus its activities upon marine research, restoration of stocks, principally on the West Highland coast; and to fundraising. There is evidence that recently the survival of salmon in the marine phase of the life cycle has improved and the fishing seasons of 2004 and 2005 have generally benefited from a greater abundance of salmon and grilse than earlier years. Only a small change in the rate of marine mortality makes a considerable difference to the number of returning adults and so highlights the importance of understanding the reasons that underlie these changes and, where possible, the steps that might be taken to avoid the unnecessary loss of fish at sea.

To this end the Trust's support of the two marine cruises undertaken jointly by Dr Richard Shelton, the Trust's Research Director and Dr Jens Christian Holst of the Institute of Marine Research, Bergen have been very successful and have demonstrated that it is possible to find the migration routes of post-smolts as they head north to their feeding grounds. The article by Dick Shelton in this edition of the Journal describes in detail the results of their observations. Their achievements form a valuable precursor to the international SALSEA research programme which is being co-ordinated by NASCO and which the Trust firmly endorses.

On the West Highland coast, where abundant and regular rainfall this summer has contributed to an encouraging salmon fishing season the Trust continues to support a number of restoration and research projects. John Webb, our Biologist continues to act as support co-ordinator for the Tripartite Working Group and thus for the Fisheries Trusts biologists and we are very grateful for the financial assistance given by Scottish Natural Heritage and the resources given by the Marine Laboratory in Aberdeen which make this task possible. Additionally the Trust has given grants

If we are to be able to support all the projects and maintain our influence and profile in the way that we would like to we need to raise our annual income further.



towards the cost of a number of research projects including, amongst others, estimating the impact of seal predation on sea trout smolts on the West Coast, a project to enhance the sea trout populations of the Orkney Islands and, much further south, a project to improve spawning areas on the River Dart and to help implement the Water Framework Directive there.

Dick Shelton and Seymour Monro have recently visited Ireland and we intend to increase our activities there from this year. As an important aside, we have been delighted to add our support to the "Stop Salmon Drift Nets Now" campaign. Do read the article on page 22 by Niall Green, who became a member of the AST in the summer.

Promotion of research and the adoption of sound scientifically based best practice in the management of salmon fisheries is the *raison d'être* for the Atlantic Salmon Trust. However there is a need also for the Trust, principally through its staff, to be involved in the committee meetings and fora where national fisheries policies and regulations are developed. In recent months we have been represented at meetings considering the proposed Fisheries Bill for Scotland, the strategy to be adopted to prevent the transfer of *Gyrodactylus salaris* to the UK and, heaven forbid that it should find its way here, the contingency planning for dealing with such an eventuality. The threats of pollution from disposal of toxic waste and in particular arising from the use of sheep dips are matters with which we have been closely involved and which are of considerable concern at the present time. In all of these meetings the Trust is acknowledged as being authoritative and influential.

All of these activities, especially promotion of research at sea are costly. We are very grateful for the many charitable trusts, generous individuals and the Fishmongers Company for their invaluable and regular support. A lot of hard work has been done, especially by Jenny Sample our tireless secretary at the Moulin office, to promote our annual Postal Auction, and to great effect. We very much appreciate the generosity of those who donate fishing opportunities to the auction and those who bid for the fishing offered, this raises an important part of our annual income.

If we are to be able to support all the projects and maintain our influence and profile in the way that we would like to we need to raise our annual income further. To this end we have established a Fundraising Committee under the chairmanship of Lord Guernsey and hope that this will bear fruit in the years to come. We need to increase our income from donations and from legacies and we are confident that this can be achieved.

I believe that it is important to project a clear image of the Trust as an efficiently run and modern organisation. Our re-styled Journal and our website have both received favourable comments but we are under resourced both financially and in terms of personnel. We propose to address this by appointing a new member of staff, an Assistant to Seymour Monro the Executive Director. Additionally the Board of Directors has taken the decision in principle that we should move the Trust's office from Moulin near Pitlochry to premises in Perth which will be more convenient for our staff and for visitors and which should lead to a more efficient use of office space and staff time. It will probably be late 2006 before we are able to complete this relocation but already planning for the move is under way.

The year 2007 will be a major milestone in the Trust's history being the 40th anniversary of our foundation. We hope to celebrate this event by organising a major fundraising dinner in London. More importantly perhaps, it would be good if we could mark this anniversary by making a significant contribution towards the better management of our wonderfully valuable but fragile stocks of salmon and sea trout. The prospect of this being possible has been enhanced by the success of the marine projects undertaken last summer and I very much hope that this new year will bring as much progress and encouragement as we enjoyed in 2005.

The President

The Duke of Westminster

This article comes at the end of my first year as President of the Atlantic Salmon Trust, a post I was eager and delighted to accept. The British Isles provide the finest salmon and sea trout fishing in the world and this, coupled with my exhilaration and enjoyment of the sport, leads to an exposure to the dedication and hard work of so many in promoting and conserving this impressive species.

Salmon have been navigating the waters of the Atlantic for millions of years until, relatively recently, the industrial revolution and the corrosive culture of commercial fishing have threatened their very existence. Man's ignorance has jeopardised the future of this remarkable fish and now it is up to us to ensure that the species survives.

Without the Trust tirelessly speaking up for these fish in the committee rooms of government, the conservation progress made to date would be considerably reduced. Engaging in legislative and political debate is a long and arduous task and it is all too easy for us, whether we be conservationists, the fishing industry, land owners or politicians, to get embroiled in arguments between ourselves. Our lack of scientific knowledge together with several competing interests and abuse of statistics has, for many years now, fuelled this dispute, as each tries to win its individual battle.

The Trust is not mired in politics and continues to spend the majority of its time leading cutting-edge marine research and restoration projects. Over the years this has meant that a valuable contribution has been made by the Trust to our understanding of the ecology of Atlantic salmon and sea trout. This year, from the restoration on the Dart in Devon to the surveys of the Loch Maree shoreline, the Trust's work continues in earnest.

I found the Trust's Research Director, Dr Richard Shelton's article on 'New insights into the lives of salmon at sea', fascinating.

I had been following his progress through various reports and press releases since May. We have been watching the survival rate of salmon at sea drop further and further in the last 30 years with little understanding of why. The ecological explanation described in Dr Shelton's report seems to make a lot of sense. Marine climate change leading to lack of food, meaning smaller, slower fish becoming prey may explain why so few salmon are returning from their epic marine migration. The research being done by Dr Shelton and his team is fundamental and revolutionary in marine science and will go a long way to benefiting NASCO's 'Salmon at Sea' project in future years. The Trust's funding of projects like this is desperately needed to tackle this issue head-on and I fully condone their support.

There is clearly still so much confusion and speculation surrounding exactly why stocks of Atlantic salmon and sea trout find it so difficult to recover. We know that aquaculture has played a significant part, and that intensive fishing, pollution and seal predation are all key issues.

I am looking forward to reading the report of John Webb which also appears in this edition of the Journal. Mr Webb, a familiar face on Scotland's west coast, has recently finished his survey of the Reay Forest Estate hatchery. This survey was commissioned in order that we might understand more fully the short- and long-term impact of the hatchery and so that a strategy for the future could be developed. I thank him for his recommendations and the hatchery will be working in tandem with the West Sutherland Fisheries Trust to assist future conservation efforts.

Co-operation is very important and through my involvement with various different conservation efforts, I often find areas where groups might complement each other. One of the most commendable characteristics of the Trust is its inclusive policy. It is vital that all groups are kept in the loop. In particular, it is not appropriate for fishermen to be ostracised in the way that farmers have in recent years. I am pleased to say that the Trust invites members of many different groups to their annual meetings and many of you reading this will be aware of its constant efforts to work with and learn from other conservationists. This attitude is what will keep the Trust alive and ultimately, I hope, see the Trust fulfil its goal.

Finally I would like to mention the life blood that makes all this work possible – funding. As you will know, the Trust receives no official funding and survives solely on private donations. None of the voluntary members of the Trust's Board or Committee or even those making up the Honorary Scientific Advisory Panel receives payment for their efforts. This all shows a worthy dedication to the cause and reassures supporters that donation money is sent straight to the front line where it is used for research, to restore and sustain.

I am proud to support the Atlantic Salmon Trust and I am impressed with the work it is doing to protect this important natural resource. Collectively we can save Atlantic salmon and sea trout from extinction. I hope you join me in continuing to support this valiant and worthwhile cause.

England and Wales

... the effect of contaminants on Salmonids is that certain pesticide levels in the aquatic environment may be too high and as such pose a significant biological risk to migratory salmon populations.

Tim Hoggarth, Deputy Director

Legislation

The Animal Welfare Bill was published on 14th October and specifically excludes fishing, live baiting and catch and release from its competency.

Environment Agency's Fisheries Statistics for 2004

The Trust particularly welcomes the heartening news included in the publication of the EA's statistics for 2004 which showed that salmon rod catches, including released fish, were dramatically up from 11,519 in 2003 to 27,332. The most abundant river was, once again, the Tyne (4,122) followed by the Eden (2,622), the Lune (1,893) and Derwent (1,770). Releases were also up from 6,425 to 13,208. By contrast, the NE drift net catch was significantly down from the last pre-buyout figure of 27,685 in 2002 by 69 netsmen to 5,921 by 16 netsmen in 2004. We had always been worried that individual net catches would go up once the number of licences had been reduced following the buyout but, statistics show that they have actually marginally reduced.

Association of Rivers Trusts (ART)

Both the Executive and Deputy Directors attended the Autumn Seminar in Pembrokeshire which highlighted Community Partnerships in fisheries management. The Trust's £2,000 award for "Contribution to Science" was made to Dr Stephen Marsh-Smith of the Wye and Usk Foundation for applying best science to headwater regeneration. The award for the "Outstanding Contribution by a Volunteer" was given to Michael Martin for his contribution to the activities of the West Country Rivers Trust. Michael, of course, is a member of the AST and served on its Board for many years.

Sheep Dip Pollution Reduction Planning in England and Wales

During the course of discussions with Dr Andrew Moore, from the Salmon and Freshwater Fisheries Team at the CEFAS Lowestoft Laboratory, who is a member of our Honorary Scientific Advisory Panel, the Trust was alerted to the impact of the leaching of agricultural pesticides, including herbicides and sheep dip insecticides, into our rivers. Dr Moore had produced a report *The Impact of Environmental Levels of Persistent Aquatic Contaminants on Atlantic Salmon* in which he concludes that the effect of contaminants on Salmonids is that certain pesticide levels in the aquatic environment may be too high and as such pose a significant biological risk to migratory salmon populations. At about the same time the Environment Agency published a report entitled *A Summary of Investigations of Sheep Dip Pollution in South West Wales 2002-2004* which particularly highlighted concerns about the use of Organophosphates and Synthetic Pyrethroid pesticides and their impact on aquatic ecosystems. Along with the Salmon and Trout Association, the Trust felt that it was now the time to take the initiative in alerting Government to the threat posed, in particular by sheep dips, to the aquatic environment and so wrote to Elliot Morley MP, Minister of State for the Environment and Agri-Environment, on 30th June 2005 asking for his guidance and views on sheep dipping. As a direct result of our approach to the Minister, the Veterinary Medicines Directorate (VMD) called a meeting on 30th September with the aim of bringing together relevant groups including farming organisations, angling, conservation and wildlife groups, sheep dip manufacturers, the textile industry and regulators from England and Wales to update them on the current situation and begin discussions on potential measures that could be taken to reduce environmental impacts. The ultimate plan was to develop a Pollution Reduction Plan (PRP). A number of factors emerged from the day's deliberations which included:

- No other effective and practical alternatives currently existed with which to treat sheep. This included the use of Ivermectin.
- Manufacturers only made marginal returns on the sale of dips. Thus there was no incentive for them to fund research into alternative options. Any such research would, in any case, take a minimum of 10 years to come to any form of resolution. It was not clear if Government was prepared to fund an associated research programme if manufacturers were reluctant to take on this task themselves.
- There were virtually no useful guidelines issued by officials or manufacturers on the current treatments and their application.
- No information was available from manufacturers on the toxicity of products and their impact on water systems. It was pointed out that it took only a few centilitres to pollute a water system.

River Wye, Heirag Pool

- No guidance was available on how to neutralise products or dispose of unwanted and waste residues after sheep dipping.
- In some cases sheep were being sprayed instead of dipping, a comparatively ineffective use of products leading to difficulties in containment.
- A Certificate of Competence was only required to be held by the purchaser of treatments. There were no such requirements in place for operators.
- Delegates were unaware of Andrew Moore's paper. The Chairman, realising its relevance, agreed that I could table it and distribute copies to all present.
- The VMD indicated that this was an ideal time to identify concerns and integrate remedial solutions in the PRP as all sheep dip products were currently going through the 5 yearly renewal of their Marketing Authorisations.

A number of initial findings and possible actions were identified:

- As there were no alternative effective treatments for sheep it had to be accepted that current medications would continue to be used and thus an effective PRP was required now.
- It was essential to develop a clear information trail from manufacturer to operator.
- Clear guidelines were required on the application and disposal of products and their threat to the aquatic environment.
- The use of sheep dips required regulation.
- The requirement for Certificates of Competence should be extended to include operators.
- Any proposals had to be quick, effective and simple to implement and regulate.

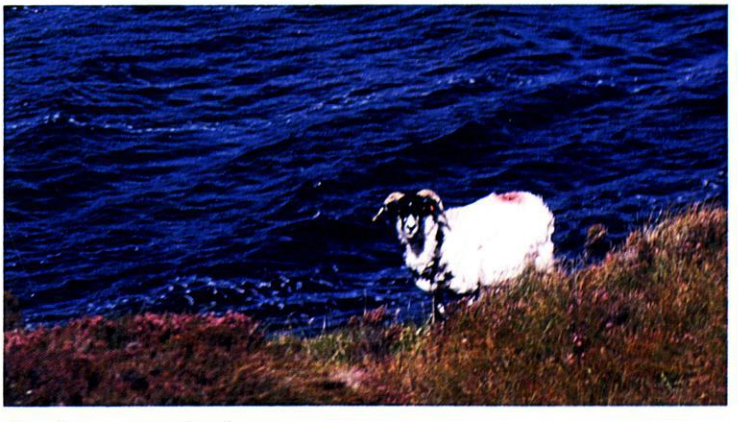
The VMD's meeting notes, written in collaboration with the Environment Agency (EA), have now been circulated. Sadly their proposals for a way forward do not reflect the urgency to set in place a robust Pollution Reduction Plan which was clearly communicated to the VMD and EA by delegates at the meeting. Their recommendations only consider:

- Circulating the notes to relevant Government Ministers.
- The need to design a poster and a one-page guide for distribution to sheep dip merchants and farmers designed to raise an awareness about the environmental toxicity of sheep dipping products and how dipping should be managed.
- Drafting a Pollution Reduction Plan for implementation by April 2006.

We now await the circulation of the draft plan. However, what is particularly disappointing is that the need to make any code of practice statutory with an effective regulatory and enforcement package appears to have been ignored.

The Fisheries and Angling Conservation Trust (FACT)

Readers will be interested to know that FACT, the formation of which was reported in the Summer Journal, is now in business. John Slader has been appointed as a part-time Executive Officer and the Anglers Conservation Association attends meetings as an observer organisation. A dialogue has been opened with both the EA and DEFRA and Jim Glasspool, the Chairman, has had exploratory meetings with Ben Bradshaw MP, the Minister with responsibilities for inland fisheries. FACT also joined with the British Association for Shooting and Conservation (BASC) and the Country Landowners' Association (CLA) to host a Rural Fringe Meeting for MPs at the Labour Party which attracted 4 Ministers including Jim Knight and Ben Bradshaw. Future meetings include one with Lynda Warren, the EA Board Member for Fisheries, to discuss future fisheries legislation proposals.



Ewe about to contaminate?

Scotland, Ireland and International

... the Trust should work even more closely with the Irish Marine Institute, many of whose current scientific activities overlap or coincide with the Trust's

Seymour Monro, Executive Director

Legislation

The Scottish Executive continues to work on the new Fisheries Bill and a consultation paper appeared just before Christmas. The Trust has been fully involved in all the preparation work and will also attend the next Fisheries Forum to be held on 30th January in Dundee. The legislative process is due to be completed by the end of 2006.

In conjunction with this, a consultation has started to seek views on the long-term management of Scotland's freshwater fisheries; what will be the role, powers and form of the future authorities?

Scottish Salmon and Sea Trout Catches, 2004 Statistical Bulletin

The Bulletin, published in September, gave some very encouraging figures for rod catches of salmon. They indicate that stocks in general are stable or recovering, and evidence from fish counters confirm that migrations upstream were higher than has been the case for many years. The story, unfortunately, was not so rosy for sea trout. The wet conditions undoubtedly helped but what impact survival at sea had upon the figures is unknown – and hence why the Trust's marine research programme is so vital.

The total reported catch of salmon by anglers during 2004 was 92,918 of which 46,249 (or 50%) were released. This is the second best catch figure since 1952 and 54% up on the previous five year average. Nets caught 27,160 salmon.

The total reported catch of sea trout by anglers was 25,860 of which 10,264 were released. Nets caught 7,824. The overall total of 33,684 caught represents a 7% decrease over the 2003 figure.

Sheep Dip

The Sheep Dip and Pesticides issues has been well covered in the 'England and Wales' section. The Scottish Executive and the relevant agencies are taking the conclusions of Dr Andy Moore's report extremely seriously and are liaising closely with their counterparts south of the Border. The Trust has been involved heavily in the discussions and will watch developments closely.

Gyrodactylus salaris (Gs)

This issue was given a high profile in the last issue of the Journal and has also received significant coverage in other publications. The Scottish Executive has appointed Arthur Griffiths – a former state vet who played a leading part during the Foot & Mouth crisis – to chair the '*Gs* Task Force'. It has two sub groups which are responsible for reviewing preventative measures and for contingency planning respectively.

The Task Force is due to report by March 2006. In the meantime, the *Gs* threat is as deadly as ever and it behoves us all to ensure that everyone knows about it and takes the right precautions before going near a river if they have come from a *Gs* infected area. The Trust has copies of the leaflet 'Keep fish disease out' available to those who would like them.

Aquaculture

Concern has been expressed about the possibility of live fish imports from Norway now that Marine Harvest is in the process of closing its Scottish broodstock sites. Any increase in the importation of eggs or fish clearly would increase the potential to import *Gs* as well. This is a complex issue as it involves EU free trade rules. However, the Trust and other fisheries organisations will maintain pressure in the right fora to resolve this issue satisfactorily.

The Aquaculture industry has published a Code of Good Practice document in draft. Furthermore, the Tripartite Working Group (TWG) process has been reviewed by the HIE and by a small group chaired by the Trust's Executive Director. Both these reviews should lead to improvements in the TWG process and thus to improved situations where wild and farmed fish share the same environment.

Scottish Countryside Alliance Education Trust (SCAET)

SCAET's principal objective is 'to reconnect Scotland with its countryside through research, study and education'. It aims to engage the next generation and to encourage and support people to take up rural employment and set up new businesses in the countryside and to introduce young people to country sports. It is currently working on a 'Scottish National Angling Programme' following on from its successful 'Get Hooked on Fishing' initiative. The Trust has made available, free, its posters of Salmon Recognition, the Salmon Life Cycle and Threats to Salmon.

Seymour Monro, Malcolm Windsor, NASCO, and Dick Shelton at Burrishoole, Co. Galway.

Those who wish to support SCAET should contact its Director on 0131 335 0200.

Wind Farms

The Trust has no remit to comment upon wind farms *per se*. However, as with any significant construction, it will make its concern clear where there may be adverse effects upon water quality, river habitat and local area ecology or bio diversity. Leaching of construction materials – especially cement – and increased silting pose particular threats to salmonid habitats. We urge that those responsible for fishery management, in whatever capacity, take a proactive, critical interest at every stage of wind farm construction and of their associated roads and pylons.

Irish visit 15th-18th November

The Research Director and Executive Director attended the Buckland Trust lecture at the Royal Dublin Society and then took part in the Marine Institute's Golden Jubilee celebrations and lectures in Newport.

Dr John Armstrong, FRS, was the Buckland Lecturer this year and gave a fascinating talk entitled *Salmon in Space: relating production to habitat quality* to a full house at the RDS, an event introduced by Dr Ken Whelan. An article based on this talk will appear in the next issue of the Journal.

The day at Newport was spent between a tour of the Marine Institute's facilities at Burrishoole and in the neighbouring lough and river catchment area – surely one of the finest natural laboratories in Europe; celebrating the first 50 years at Burrishoole; and listening to a fascinating series of lectures in the Hotel Newport in the evening.

The reduction and eventual closure of these most damaging mixed stock interceptory nets (which caught 120,000 salmon in 2004) will greatly benefit not only the rivers of Ireland but also those in south west Scotland, Wales, south west England, France and Spain.

It was a hugely useful and enjoyable trip. There is no doubt that the Trust should work even more closely with the Irish Marine Institute, many of whose current scientific activities overlap or coincide with the Trust's: marine research, the effects of aquaculture and predation, and the improvement of river habitats to name but a few.

Irish Drift Netting

The indications are that all the pressures from so many quarters, from the EU to the campaigners on the streets of Killarney, are beginning to pay off. The Trust actively supports the 'Stop Salmon Drift Nets Now' campaign, so energetically led by Niall Greene, a new member of the AST and whose article on this topic appears on page 22. The reduction and eventual closure of these most damaging mixed stock interceptory nets (which caught 120,000 salmon in 2004) will greatly benefit not only the rivers of Ireland but also those in south west Scotland, Wales, south west England, France and Spain.

NASCO

The Executive Director attended the NASCO meetings in Vichy, France in June; whilst John Webb, our Biologist attended a joint NASCO/ICES seminar – partially sponsored by the AST – in Bergen, Norway in November. The messages from NASCO are positive: a more proactive and consultative attitude for the future, increased effort into researching the lives of salmon at sea under the SALSEA project and a more positive relationship with the aquaculture industries.

The Trust will continue to work very closely with NASCO and particularly over the marine project.

France

Jeremy Read, a former Executive Director, attended a seminar in Bergerac in October on 'Salmon Rehabilitation'. This was hosted by AIDSA and marked the twentieth anniversary of the twinning of the Dordogne and the Jacques Coutier (Quebec) rivers.

Research

Dick Shelton and Ken Whelan, Marine Institute of Ireland and NASCO, at Burrishoole Co. Galway.

Dr Dick Shelton, Research Director

Research projects supported in 2005

During 2005, The Honorary Scientific Advisory Panel of the Atlantic Salmon Trust supported research projects, less the marine research, to a total value of nearly £20,000. An update on progress appears below.

Sea Trout & Seals (FRS & SMRU)

During 2005, Dr John Armstrong and his FRS colleague, Mr David Hay, supervised the tagging of twenty sea trout smolts at the FRS trap on the River Shieldaig which runs into upper Loch Torridon in Wester Ross. Each of the tags generated high frequency sounds (well above the hearing range of the fish) and the movements of the fish were followed for periods of up to 55 days using an array of 30 hydro-phones deployed on the bed of the loch. All except one fish remained within the loch. By the end of the 55 days, only 3 of the tagged sea trout were still active. This result is indicative of a high rate of mortality, some of which may be associated with the effects of the tags themselves on the health of the fish and their susceptibility to predation and disease.

In separate trials at the Sea Mammal Research Unit, headed by Professor Ian Boyd, sea trout smolts carrying P.I.T. tags were fed to 8 captive seals fitted with tag detectors; 28 of the 32 smolts were successfully detected. Both these studies, which form part of a larger investigation into the fate of sea trout in north west Scotland, were supported by grants from the Atlantic Salmon Trust which is also contributing to the cost of a more broadly based study, also led by Professor Boyd, into the place of seals in the ecosystem of the North Sea.

Electro-fishing of Loch Margins (WRFT)

Summer electro-fishing surveys by Drs Shelton and Walker (then of FRS) along the margins of Loch Maree in Wester Ross in the 1980s revealed substantial numbers of early trout parr. During the 1990s, minnows, *Phoxinus phoxinus*, were introduced into the loch by anglers using them as live bait. Similar surveys, undertaken in the autumn of 2005 by Dr Peter Cunningham of the Wester Ross Fishery Trust and with the support of the Atlantic Salmon Trust, revealed large numbers of minnows but few trout. While making due allowance for possible seasonal differences in the results, there is a strong possibility that the presence of the minnows has displaced the young trout into deeper water where they are at greater risk from predation. A survey this autumn in Loch Coulin, which contains no minnows, found young trout along its margins.

Surveying Young Salmon Resources in the Cumberland Eden (ERT)

During January 2005, the Cumberland Eden was subjected to such severe spate conditions that the Eden Rivers Trust really feared that redd wash out would seriously affect subsequent fry production. Detailed electro-fishing surveys, supported by the Atlantic Salmon Trust and carried out during the year under the direction of Miss Judith Dickson (Biologist to the ERT), nevertheless revealed that fry numbers in both tributary and main stem sampling sites were within the range recorded historically.

The Atlantic Salmon Trust also supported the work in the Eden system of Miss Lucy Dugdale, who is studying for her PhD with the University of Durham. Miss Dugdale is using data from aerial surveys, land use maps and a digital terrain model to explore the hydrological links between the river and the main features of the adjacent catchment. Miss Dugdale hopes to use the results to predict and validate the effects on the Eden of such local features as erosion, over-shading and diffuse pollution.

Baseline Survey of Sea Trout Burns in Orkney (Malcolm Thomson)

Despite their lack of large rivers, the Orkney Islands have historically supported valuable sea trout fisheries. Concern over the effects of aquaculture developments on these resources has stimulated Mr Malcolm Thomson of Stromness to plan a baseline survey of potential sea trout spawning burns in Orkney. The Atlantic Salmon Trust is currently providing both financial and, through on-site visits by our Field Biologist, Mr John Webb, direct, practical support to this important initiative which is the first study of its kind in the northern isles.

The Trust also gave donations to the River Dart Restoration Project, the NASCO/ICES Aquaculture Seminar in Bergen and a River Engineering Seminar held in Birnam.

Outlet from Loch of Stenness, Orkney

How many eggs do salmon parr eat at spawning time? (FRS and Aberdeen University)

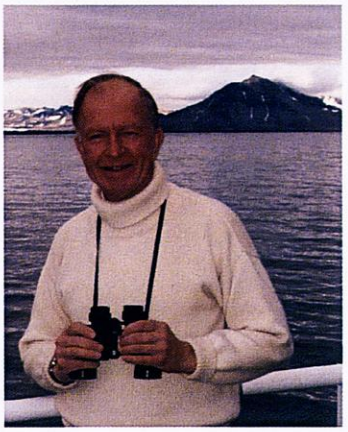
It is well known that salmon parr scavenge stray eggs at spawning time. The parr often swallow the eggs whole and, because of the small size of the parr and the large size of the eggs, tell-tale bulges in their bellies sometimes give the game away. The Atlantic Salmon Trust is helping to cover the laboratory costs of a joint investigation with the University of Aberdeen led by Mr Alan Youngson (FRS) of experiments designed to account for egg losses to which parr contribute during and after spawning.

The study will involve the application of established biochemical techniques in combination with relatively new knowledge of the natural occurrence of the stable isotopes of nitrogen. Both fatty acid composition and stable isotope ratios for nitrogen differ characteristically in tissues built up in fresh water or in the sea. In both instances, parr are expected to show freshwater profiles but the tissues of adult salmon and their eggs will typically exhibit marine ones. Parr which have eaten salmon eggs and assimilated the material into their own tissues ought to show intermediate tissue types. By examining parr sampled from streams before and after spawning, and comparing their tissue profiles with those of captive parr which have been fed known numbers of eggs, it is hoped to calculate how many eggs the free-living parr have eaten. Laboratory analyses of both fatty acid composition and of nitrogen isotope ratios will be used and the methods compared to see which procedure is the more informative. Parr are not the only consumers of salmon eggs and several potential invertebrate scavengers, such as the larvae of large stoneflies will be tested in the same way.

Although this study is intended to be a small scale preliminary to more extensive later investigations, the results are expected to be of great practical interest. They will supply one of the currently missing links between the relatively large numbers of eggs laid in autumn and the much smaller numbers of fry which hatch and emerge in late spring. They will also quantify the benefits that parr enjoy from access to such a rich source of fat and protein late in the growing season and just before the onset of winter.

The Trust also gave donations to the River Dart Restoration Project, the NASCO/ICES Aquaculture Seminar in Bergen and a River Engineering Seminar held in Birnam.

New insights into the lives of salmon at sea



'Captain' Dick Shelton on the Johan Hjort. *Spizbergen in the background.*

Dr Richard Shelton, Research Director

When salmon smolts abandon the shallow security of a frugal feeding territory in the river in which they were born, to seek their fortunes among the far greater riches of the sea, they bargain an increased risk to their lives against the chance to attain a larger adult size, and with it, the opportunity to lay and fertilise more and larger eggs and thereby leave more offspring. It is an ancient way of life which has been adopted by a wide range of species from lampreys to three-spined sticklebacks. What makes the Atlantic salmon special is that it takes the gamble to extremes which combine thousands of miles of ocean migration with a remarkable capacity to home to its natal river. Because of the paucity of the fossil record, which tends to favour fishes which live and die in slow flowing muddy rivers rather than fast flowing stony ones, we have no way of knowing how long it took the ruthless forces of natural selection to perfect the life cycle of *Salmo salar*. The Atlantic is the youngest of the world's oceans, widening at the mid-Atlantic Ridge at the rate of a thumb nail's width a year. We do not know how much of that time it took for our salmon to evolve the tools it unconsciously uses to find its way out and home, only that a channel gently widening from narrow sea to mighty ocean, would provide as good an opportunity as any, for a fish following a coastal pattern of marine migration like an Arctic charr or sea trout, to achieve something more ambitious and reproductively rewarding. What we can be certain of is that some populations of Atlantic salmon had reached this milestone in its development as a species, tens of millions of years before Man had emerged as a threat to the integrity of rivers and to the lives of fishes at sea.

> ... an Irish drift net fishery pursued on a scale which makes a cynical mockery of modern, population-based salmon management.

From the moment that Man, the terrestrial mammal, developed the capacity to obstruct and pollute watercourses, the finely honed life history characteristics of salmon were exposed to threats for which their evolutionary history had not prepared them. As the industrial revolution spread across the countries bordering the North Atlantic, so more and more salmon populations lost the spawning and nursery habitats on which they had depended to sustain their early development. Only with the relative decline of heavy industry among the countries that pioneered the Industrial Revolution are we beginning to see signs of recovery in rivers like the Clyde, Tyne and Rhine. Welcome as this news is, it has unfortunately been accompanied by new threats to the lives of salmon at sea for which their evolutionary background had, once again, not prepared them. For some years, directed fishing on the high seas by drift net and long line posed the most serious of the new marine threats. Buyout schemes, made possible by the increased availability of intensively reared salmon, have largely removed that threat, at least for the time being, but some drift net fishing still takes place off the coast of north east England and Ireland's salmon populations, and to a lesser extent those of the west of England, Wales and Scotland, continue to reel before an Irish drift net fishery pursued on a scale which makes a cynical mockery of modern, population-based salmon management. Given that, sooner rather than later, this economically and biologically illiterate fishery will be closed, and that fewer and

Norwegian Research Vessel Johan Hjort.

The AST flag flies alongside that of Norway on the Johan Hjort.

fewer of the long established coastal netting stations will continue to operate, it would be comforting to think that we can now look forward to increasing numbers of salmon in our rivers. Yes, there is a little evidence of improved runs here and there and Tweed, already greatly improved by scientifically planned in-river management, has benefited enormously from the reduction in the Northumbrian drift net fishery. However, the continuing relative lack of older sea age fish in returning stocks, throughout their southern European range, is strong evidence that the survival rate of salmon at sea is still much lower than it was 30-40 years ago when a number of other sub-arctic species, including cod and haddock, were also enjoying periods of high abundance. There is general agreement among fishery scientists that widespread changes like these have their basis in the effects of alterations in marine climate on what biologists call, secondary production, the community of small planktonic creatures in the water column that sustain the lives of fishes that spend part or all of their lives in mid-water. In the words of the great English fishery scientist, David Cushing, "fish grow to avoid mortality". In other words, the longer fish remain small the slower they can swim and the greater is the range of predators capable of catching and swallowing them. Work by the Sir Alister Hardy Foundation for Ocean Science, partly financed by the Atlantic Salmon Trust, has demonstrated that changes in the abundance and distribution of certain crustaceans like krill could well have prevented post-smolt salmon from "eating their way out of trouble" as readily as they had in the past. We need to know such things, even if we can do nothing about them, so that we can focus our efforts on things we **can** do something about.

The challenge for the future is to extend this knowledge to more of their geographical range and to put this increasing understanding to practical use in managing the threats salmon face

Foremost among the latter is the effect of infestation by sea lice from caged farmed salmon on the survival of wild smolts migrating to sea down long sea lochs. It had long been known that post-smolt and older sea trout can be affected in this way because at least some of the moribund individuals return to fresh water to relieve the leakage of body fluids into the sea through their damaged skins. Post-smolt salmon are fish of the open ocean and do not respond to skin damage by returning to the river. My Norwegian colleague, Dr Jens Christian Holst, knew from experimental work that post-smolt salmon were at least as vulnerable to attacks from sea lice as post-smolt sea trout but it was not until he was able to combine trawling at the surface of fjords with a live fish cod end that he was able to observe the problem at first hand in the fjords and coastal waters of Norway. Later, he and I were able to see exactly the same phenomenon to the north west of Scotland. There, however, the similarity ends. Although, in Norway, a strict policy of sea louse control was introduced and enforced by independent inspectors, in Scotland voluntary "Area Management Agreements", arranged under the auspices of a "Tripartite Working Group" on which both wild and farmed salmon interests are represented, were the inadequate substitute. Some local success has been reported but the results fall far short of those achieved in Norway, where many previously affected salmon populations are recovering from the effects of sea louse predation. The Atlantic Salmon Trust continues to press for the introduction of the strict control of sea lice in Scotland, in the meantime contributing strongly to the Tripartite Working Group, including the Chairmanship by Seymour Monro, of its Restoration Subgroup. The Trust's Biologist, John Webb, also supports the efforts of local Fishery Trust staff seeking to restore stocks in those areas of Scotland and the Northern Isles where salmon and sea trout resources have suffered as a result of fish farm-related effects, including the potential genetic problems posed by the presence of escaped farmed fish at spawning time. Much of this work in support of local staff takes place on the spot, including in the river! However, it is also important that local restoration efforts take account of the most up-to-date knowledge available to the wider world of science. This knowledge John is also able to supply in his capacity as Restoration Co-ordinator for the Tripartite Working Group, a post financially supported by Scottish Natural Heritage (SNH), the principal Government

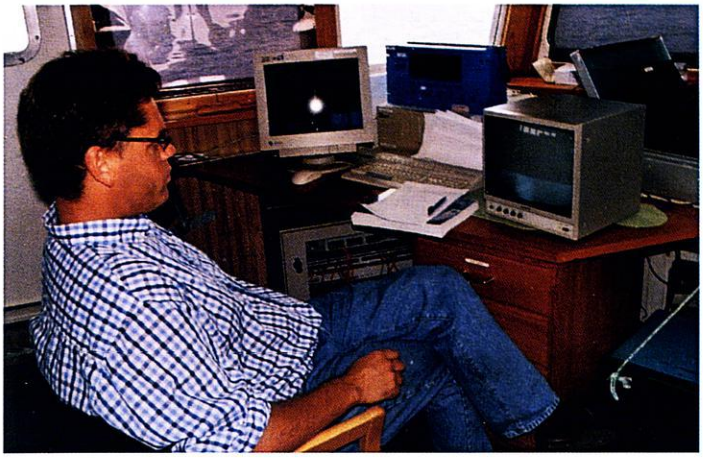
Revolutionary new gear: the open 'cod end' with the video camera housing on the right side, and Dr Jens Christian Holst with the catamaran and transmitter.

nature conservation body in Scotland and an organisation which shares the Atlantic Salmon Trust's concern about the plight of salmon and sea trout resources in areas of intensive fish farming. SNH interest in these fishes extends beyond the fish themselves to include their role as temporary carriers of the larvae of pearl mussels which depend on healthy stocks of migratory fishes to transport their young stages safely upstream.

Our current understanding of the distribution of salmon in the north-east Atlantic is largely based on trawling in the surface of the sea using gear developed in the early 1990s by the Institute of Marine Research in Bergen. The early work was undertaken using a conventional mid-water trawl, fitted with additional flotation and rigged to fish with the head line breaking the surface. As a result of this work, undertaken over the last decade by both Norwegian and Scottish research vessels, we know that salmon of all marine life stages spend considerable periods in the upper five metres of the sea, especially during the daytime. This behaviour greatly reduces their vulnerability to most forms of mid-water and bottom fishing for other species but it cannot save them from the relatively new fashion for trawling at the surface for mackerel and herring. We still do not know how serious a problem this is but we already know that it is likely to vary from year to year according to the degree of coincidence between the distribution of the salmon and the mackerel and herring at which the fisheries are targeted. On present evidence, the behaviour of the salmon appears the more constant at least during their early months at sea.

A succession of Norwegian and Scottish research cruises has found that post-smolt salmon migrating north tend to be concentrated in small groups along the edge of the continental shelf, apparently making use of the so-called Slope Current to assist their passage north into the richly productive waters of the Norwegian and Greenland Seas.

Building on the results of our earlier work, the Institute of Marine Research developed a modification of the surface trawl in which the net mouth opening would be extended laterally to 60 metres, so enabling us to triple our sampling power. It was not the only modification planned for the net or even the most important one. The cod end, which would otherwise have trapped the catch, was to be left open and a closed circuit television (CCTV) system installed so that we could observe the fish passing harmlessly through the net. Jens Christian Holst had already experimented successfully with cameras in trawl nets using an arrangement in which the images were recorded on video tape. This simple system worked well but it had the disadvantage that the images could not be seen until the tapes were recovered. Recovery was possible only after the net and camera were safely back aboard. To know precisely where the fish were at the time they encountered the net, we needed to see the images at the same time as the camera and this would require a means of transmitting its output to the bridge of the ship. Radio waves are severely attenuated in sea water so there was no question of attaching an aerial directly to the camera. The solution was to connect the camera by cable to an aerial projecting up into the air from a small catamaran, towed some way astern of the net. The new gear was tested for the first time in late May from the Fishery Research Ship, *Scotia*, principal research vessel of the Scottish Executive's Marine Laboratory in Aberdeen. We began by testing the net on its own in the lee of the Shetland mainland. It performed well but the more demanding task of testing the CCTV equipment and the catamaran required calmer sea conditions and these we found in the northern Minch. Each piece of the assembly worked perfectly on its own but, when we attempted to operate the three main elements of the gear together, we repeatedly failed to obtain stable images of events inside the net. Thanks to the patient efforts of the ship's Electrical Engineer and John Beaton of the Marine Laboratory's hydrographic team, the problem was eventually traced to the presence of sea water sucked by capillary attraction into part of the cable connecting the camera to the aerial on board the catamaran. Once the defective section had been cut out and the cable re-sealed, we saw our first good images and, a few minutes later, our first post-smolts, two fish in company making their way northward up the Minch. Taking advantage of the calm conditions, we tested the fully deployed gear over a range of trawling speeds, observing the performance of both the net and the aerial assembly from the ship's rigid inflatable boat (RIB). By the end of these trials, we knew that we had a research tool capable of withstanding the kind of strains it would be liable to meet in the long swells of the open Atlantic. Had the cruise ended at that point, Jens Christian and I would have been well satisfied with the successful proving of his



Dr Jens Christian Holst watches the monitor screen on the bridge.

An adult salmon caught on video as it swims through the net west of Bear Island.

revolutionary new gear. However, we still had three days left and, for the first time since we left Aberdeen, there was a moderation in the weather. Fishing above the edge of the continental shelf to the west of the Outer Hebrides and on both sides of the Wyville Thomson Ridge in the Faeroe-Shetland Channel, we made observations on 178 post-smolts and three adult salmon. So clear were the images that we were easily able to recognise one of the adults, from its fin deformities, as an escaped farmed fish. We were also able to make further observations from the RIB on the performance of the gear as it was towed at speeds up to 6 knots, a somewhat character building exercise in the breaking swells of the open Atlantic! Later, in August, we were able to use the gear again in pursuit of salmon, and other surface swimming fishes, in the Greenland and Norwegian Seas using the Norwegian Fishery Research Ship, *Johan Hjort*, a vessel very similar in design to *Scotia*. It was apparent from the results of our observations on post-smolt and older salmon on both cruises that, unlike many more numerous mid-water fishes, salmon do not form large, tight shoals but move about in small numbers. The largest number we saw together in the net at any one time was 11. This pattern of distribution, depends for its effectiveness, not on saturating predators by sheer numbers as mackerel, herring and sprat do, but in not attracting their attention in the first place. It is a valid defence for a relatively rare fish living in the surface and potentially at risk of attack from above.

One of the most interesting points about the observations made to the west of Scotland is that the fish appeared to be aware of the Slope Current independently of local variations in temperature, salinity and depth, suggesting, perhaps, that they either have a means of assessing their rate of progress through the earth's magnetic field or in relation to some celestial cue. We still lack direct observations on how far salmon dive when they leave the surface in response to changes in light intensity or other drivers but, the recently analysed records of data storage tags attached to fish returning to Norwegian rivers, reveal apparent feeding activity down to as much as 140 metres before the fish returns to its cruising station near the surface. We still have much to learn about the lives of salmon at sea but we already know enough to pinpoint some of the locations and depths where these precious fishes are most vulnerable. The challenge for the future is to extend this knowledge to more of their geographical range and to put this increasing understanding to practical use in managing the threats salmon face as they grow to maturity in one of the richest but most dangerous habitats on earth.

One of the immediate priorities is to survey the distribution of post-smolt salmon from our great eastern rivers as they make their passage across the northern North Sea to the Norwegian Sea. Do they do this on a broad front, where they would be less vulnerable to concentrated surface fisheries, or do they crowd into narrow corridors to take advantage of hydrographic features like the eastward flowing Dooley Current? We now have the equipment to answer this question provided the ship time could be made available and we were blessed with clement weather over the critical weeks of the migration. What happens later in the lives of salmon at sea and how long do they really spend at depth, especially during the long months of winter? Part of the answer might come from modifying the CCTV trawl so that it can provide images from a greater range of depths. Another approach would be to fit tags, capable of recording and storing hydrographic parameters like sea temperature and depth, to more salmon. Looked at in the light of hydrographic survey data, the records from such studies could tell us much about the distribution of salmon later in their lives, provided we could get sufficient returns from fish large enough to carry the tags in the first place. Jens Christian Holst has made the ingenious suggestion that tagging well-mended kelts leaving rivers with traps at which any returning fish could be screened, could offer a more cost effective alternative to catching and tagging the salmon at sea and relying on casual returns from the relatively small number of fish taken by anglers.

Clearly we have a great deal to do and pay for if we wish to gain a real understanding of the lives of salmon at sea. Should this surprise us? Not if we recall the uncomfortable fact that Mother Nature has ever been a coy mistress and if you wish to see Her naked you must be prepared to pay the price!

The activities of the Restoration Support Co-ordinator

John Webb, Field and Research Biologist

Part of my duties as the Atlantic Salmon Trust's biologist is also to act as West Coast Restoration Support Co-ordinator. The post was established in early 2003 as part of a package of initiatives which have stemmed from the Tripartite Working Group (TWG). The TWG was formed to bring together Government, salmon farming and wild fishery interests to address the decline in wild salmon and sea trout stocks in the West of Scotland. The primary aims of the post are to establish and co-ordinate an advice and evaluation framework in support of conservation and restoration projects for salmon and sea trout in freshwater environments. My role is therefore to provide a range of sound, scientifically based information and advice to biologists and fishery managers.

The post also acts to complement other initiatives including the appointment of the TWG Development Officers and the delivery of regional Area Management Agreement (AMA) projects. The appointment was initially for a period of three years (just extended for a further three years), and is funded by the Atlantic Salmon Trust and Scottish Natural Heritage and with support from the Scottish Executive's Fisheries Research Services. A Restoration sub-group, made up of a selection of 'stakeholder' representatives including the Association of Scottish Fishery Boards, Institute of Fisheries Management (Scotland), Fisheries Research Services and the Scottish Executive, guides my activities.

The area covered by this post covers nearly a third of the land area (including islands) of Scotland, ranging from the Highlands of West Sutherland in the north to the rolling expanses of Galloway in the south west. The post involves working with 9 different Fishery Trusts covering about 30 Fishery Districts. The area includes over 200 rivers whose salmonid stocks are impacted by issues as varied as fish farming, agriculture, forestry, acidification, mining and other major industrial legacies, wind farms and hydro-electric development.

The process of co-ordinating restoration activity over such a large and diverse area could be approached in a number of different ways. From the outset, it was important that I began by making contact and establishing working relationships with the various Trust biologists, District Boards, angling clubs and proprietors. At the same time, it was also important to gain a detailed understanding of the main factors threatening fish populations and their associated fisheries over the area – both over the broader, regional scale (e.g. the North West Highlands) and in particular situations on individual rivers and their sub-catchments.

Fisheries restoration is usually judged by how fish and their habitats respond to management. Therefore, in an effort to provide consistent standards of resource assessment and restoration planning support, it was important to gather as detailed an overview as possible on the salmon and sea trout distribution and abundance (current and historical), together with the condition of their critical freshwater habitats. Ideally such assessments should be routinely undertaken over a range of geographical scales that reflect the various problems impacting on stocks, together with the range of geographical scales over which the various tools of restorative management might be applied.

From a modern and fully integrated management planning stance, the distinction between the potential utility of synoptic (i.e. broad) scale evaluations of fisheries problems versus more localised assessments is important. A synoptic perspective tends to be comprehensive in geographical coverage and can therefore involve the integration of a wide range of interacting variables. Such approaches also serve to inform stakeholders about important wider scale conditions and trends in core attributes of both salmon and sea trout populations and their habitats. They are therefore particularly useful for evaluating responses to larger scale management programmes (for example, the impact of Area Management Agreements, reductions in coastal netting exploitation, broader-scale improvements in sea survival or changes in land use etc.). In contrast, finer scale, more localised perspectives are usually limited in their application to looking at relatively local issues.

In 1998, a basic stock rebuilding framework was agreed by NASCO and its contracting parties in the context of the precautionary management of salmon stocks. Though focused around salmon, the NASCO guidelines probably constitute one of the most useful frameworks for the restoration of both salmon and sea trout populations; detailing an array of generic management measures to restore stocks, including: evaluation of the status of stocks,

The TWG was formed to bring together Government, salmon farming and wild fishery interests to address the decline in wild salmon and sea trout stocks in the West of Scotland.

Spawning burn, Glen Hurich

identifying threats and problems, planning and prioritising action, stakeholder involvement, social factors, interim measures and monitoring and evaluation.

Guided by the NASCO output – together with relevant supporting scientific literature, a suite of broad proposals was subsequently presented to TWG Restoration sub-group for their consideration and support. The main thrust of the proposals focused around a requirement for a detailed review of west coast stocks and the condition of their critical habitats. The main reasoning behind this approach was threefold: first, to generate for the first time, a thorough, multi-scale assessment of the status of west coast stocks (i.e. perhaps answering the questions … how serious and extensive is the 'problem'? Does the 'problem' with west coast stocks extend further than the geographical limits of marine fish farming?). Secondly, to generate a firm and defensible context for restoration planning, and thirdly, to produce a robust, scientifically based benchmark with which to measure the impact of management initiatives against in the future.

However, notwithstanding the very large geographical scale over which the current problems besetting west coast stocks are likely to be operating, some stakeholders continue to argue that processes of assessment and the development of management goals and actions are a matter solely for local interests. Indeed, despite extensive efforts to promote and progress with an attempt to evaluate comprehensively the situation affecting west coast stocks, the initiative has failed to secure the necessary majority support of the TWG Restoration sub-group.

In its widest sense, restoration literally implies reassembling parts of natural ecosystems. However, such work can be very expensive and time consuming – even when conducted over comparatively small areas. The delivery of both **sustainable** and **cost-effective** restoration management is obviously important. Indeed, it is only when effective methodologies have been developed, that truly cost efficient programmes can be implemented and expanded with increasing confidence of success.

Restoration activity usually focuses on improving the conditions for native fish. Nevertheless, like conservation, restoration can be focused at different levels: around a particular species, communities of different species or whole ecosystems. Defining the main goals for restoration projects is therefore usually considered as the most important component of a project, because it serves to focus stakeholders' expectations, it drives the plans and actions and serves to define the nature and extent of post-project monitoring that will be required.

By definition, the concept of *co-ordination* implies actions etc. towards the harmonisation or a common action or effort. However, the management of freshwater fish in Scotland is currently characterised by a fragmented and an often philosophically disjointed system that operates without detailed guidance or direction via statutory controls or nationally approved (voluntary) management guidelines. As a result, there are currently no nationally agreed guidelines for either the setting of restoration goals or the most appropriate means of managing damaged or degraded systems.

One of the main consequences of this paradigm is that many stakeholders continue to operate without guidance on either restoration planning or which management techniques are likely to be most appropriate. As a result, the important distinction between the management support requirements of reasonably healthy populations of salmon and sea trout (that may or may not support a fishery), and those that are likely to be critically degraded and depleted are not widely understood. Furthermore, confusion exists about how local management initiatives should fit into the larger context of the broader-scale restoration and recovery of west coast salmon and sea trout stocks.

Arguably, these kinds of problem reflect a number of important failings in the current system of national fisheries management. However, it is also a symptom of the limited availability of information on the effectiveness of various management techniques on Scottish rivers and lochs. Against this background, efforts have recently been focused on trying to encourage the development and adoption of a new, broad advisory framework for conservation and restoration activity on Scottish rivers and lochs. The main purpose of such an approach would be to try and produce a scientifically and economically based consensus on the most appropriate

Tributary of River Orkney (Argyll)

Lower River Lael (Loch Broom)

Loch Stack (Sutherland)

management techniques that should be used. Some important questions remain unanswered: For example, what should managers focus on first – the fish or their critical habitats? Which river or loch systems should be tackled first – those systems that still contain the remnants of wild stocks, or those that are practically fishless? Furthermore, is it possible to develop guidelines for different sets of conditions under which different kinds of goal are appropriate, and what should be the key thresholds and trigger points for different management approaches?

The potential benefits of such an initiative are varied and likely to be worthwhile; by acting as a useful driver towards improvements in local fishery management performance via enhanced dialogue among managers and biologists, increased restoration planning expertise and more general levels of focused, forward thinking.

Salmon and trout management in Scotland has traditionally tended to focus monitoring and management activity on single attributes – often driven by attempts to simply generate 'extra' fish. Management therefore often takes place without the benefit of a full understanding of the impacts of the broader scale ecological and physical processes that exist.

Truly cost-effective and sustainable river restoration will necessarily require an expanded understanding of resource degradation. However, this can be achieved only by working at levels beyond basic fish biology.

In an effort to reduce the risk of ill-planned and wasteful projects, the co-ordinator is also attempting to increase the knowledge and skill base of biologists and fishery managers by encouraging a broader awareness and understanding of key information and skills over a wide range of disciplines. To this end, advice and support is given to Fishery Trusts, Fishery Boards and proprietors in a number of different ways. The most common include the use of site visits, presentations, training, encouraging and developing links to specialists in key fields, and providing summaries of published scientific information. This work also involves the targeted gathering and dissemination of the results of similar work undertaken elsewhere – drawn from a large collection of more general fishery science articles.

Perhaps not surprisingly, requests for assistance have tended to reflect the wide diversity of issues affecting rivers and lochs from the heather clad Highlands to the expanse of modern and historical development legacies scattered along the lower Clyde! Nevertheless, despite the diverse range of subjects that restoration support work inevitably involves, one area of management interest tends to emerge repeatedly – namely, the role of hatcheries and stocking.

At the present time, many routine management and restoration initiatives rely either partly or solely on the stocking of hatchery reared eggs or fish. However, despite over 150 years of widespread use, there has been little or no critical evaluation of the use of hatchery based supplementation on Scottish rivers. A range of important biological, genetic and economic questions associated with their use has therefore received little or no independent scrutiny.

Many hatcheries operating on west coast rivers do so against a background of considerable uncertainty about their impacts on wild fish populations – particularly those that are critically depleted and weakened. My core responsibilities revolve around the promotion of management actions that will serve to conserve, maintain and boost wild populations of salmon and sea trout over the longer term. My work now increasingly involves assisting the Fishery Trust biologists and fishery managers to assess the role of their hatcheries critically. To this end, existing and proposed hatchery programmes are being carefully reviewed, and those actions that are regarded as either posing unnecessary risks of mortality, wastage or that are simply incompatible with the conservation of wild fish resources are being identified.

In 2006 it is the intention to produce the first of a set of guidance notes to help proprietors, managers and biologists alike with restoration activities.

Editor's note: Further details of the Co-ordinator's work can be obtained from John Webb who can be contacted on (01224) 876544, Email: webbj@marlab.ac.uk

The Girnock and Baddoch Fish-traps on Deeside

A. F. Youngson, J. C. MacLean and I. S. McLaren, FRS Freshwater Laboratory

One of the main tasks of FRS Freshwater Laboratory is to provide the Scottish Executive with assessments of the state of the salmon fishery resource in Scotland. The unusual complexity of the salmon's life cycle makes this task difficult and there is no single procedure that provides information of sufficient quality or scope. Instead, we use a mixture of approaches to illuminate any problems at each of the various phases of the life cycle and integrate the results to provide a rounded overview.

Assessment is further complicated by the fact that salmon belong to discrete breeding populations. Indeed, tagging and genetic studies show that several or many populations exist within most of the larger river catchments. Because these populations breed separately and because they live in different places, the productivity of any one population is correspondingly capable of varying independently of the productivity of the others. The fish produced by separate populations also differ in characteristic ways. In particular, higher altitude streams tend to produce smolts that, as adults, return to their rivers relatively earlier in the year. These are the early-running, multi-sea-winter salmon (also known as spring fish) and the early-running grilse. Tagging studies show very clearly that run-timing is determined to a large extent by the genes that fish inherit from their parents. Spawners can also be shown to home with high precision to the areas where they lived as juveniles. In this way, spawners, showing the genetic characteristics of their parents, perpetuate the links between populations, the locations the populations occupy and the genetic characteristics of the fish that the populations produce.

This systematic diversity of salmon populations is of central importance in assessment because the value of the fishery resource is determined by only two main factors – the numbers of adult fish returning to rivers and the range of dates over which they enter fresh water. In Scotland, particularly, run-timing is unusually diverse. Indeed, fresh-run salmon enter rivers throughout the entire year. The national angling economy benefits greatly from operating in one of the few places in the world where such extended fisheries are possible. Indeed, with the exception only of December, angling is permitted, on one river or another, in every month.

As is well known, early-running salmon have shown marked declines over recent decades. The exact reasons for the declines remain unclear although major increases in natural mortality rates in the ocean are firmly implicated. Figure 1 shows the long-term trends for the estimated pre-fishery abundance of the monthly components of the Scottish spring catch. Although the values are based on the reported catches for each month, by both anglers and netsmen, they are estimates of the numbers of fish approaching the Scottish coast, before they reach any of the fisheries. The figures run from 1952, when records began and they stop in 1997, when the adoption of catch and release probably began to have an effect on the continuity of the figures. It can be seen that abundance declined in all the spring months over the period examined and that the declines were greater in the earlier months. Combined catches across Scotland are shown but separate investigation of individual rivers shows that they have all declined in a similar way. In recognition of this, various measures – including, notably, catch and release – have been introduced to reduce the exploitation of early-running salmon. The aim has been to ensure that as many as possible of the fish reach their spawning streams and that juvenile numbers remain correspondingly high.

It is important to know what the long-term trends are. However, picking out the trends plays down year-to-year variation in the values – and these are quite large. Emphasising trends based on catches also plays down year-to-year variation in catchability due, for example, to variation in rainfall and river levels and year-to-year variation netting effort caused, for example, by variation in sea conditions. Trends also tend to emphasise past events at the expense of recent ones and are therefore not particularly good at picking up changes as they happen. Different, complementary types of information are needed to look closely at recent events and this is where the Deeside traps come into play.

Fisheries Research Services, Freshwater Laboratory operates two sets of fish-traps on spawning streams in the upper catchment of the Dee. The first, which began operating in 1966, is located on the Girnock Burn near Ballater. The other, which is sited on the Baddoch Burn, near Braemar, was installed in 1988. The traps catch adult salmon migrating upstream and juveniles migrating downstream. Fish are counted, examined and tagged before being released to continue their journeys.

Adults migrate into the spawning streams only in October and November, close to spawning time. The juveniles they produce leave as smolts after either two or three years of stream life.

Both streams are high in the catchment and, as would be expected, spawning in both streams is dominated by early-running fish. Most are two-sea-winter fish but a few small, early-running grilse are also present. The fish-traps provide important information about smolt survival rates, the number of fish returning to spawn and the importance of catch and release.

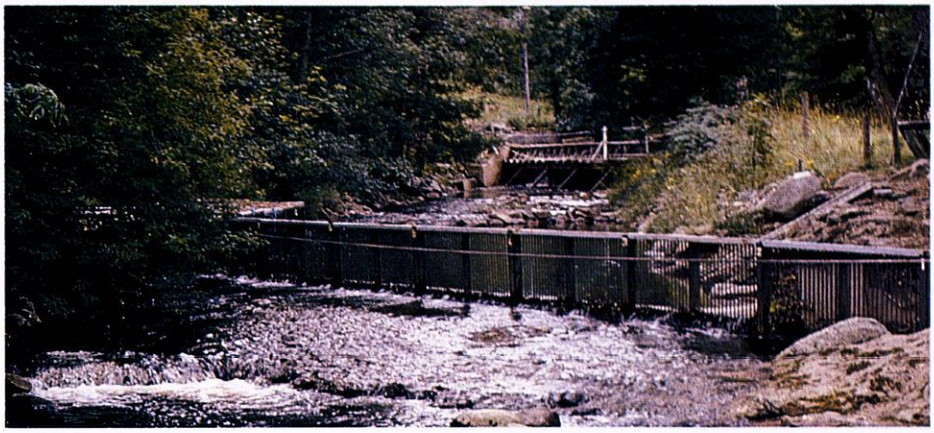
In Figure 2, the proportion of smolts that survived to spawn each year is shown for both the monitored streams. In the early years, fisheries in the ocean, on the coasts, and in the Dee estuary killed many fish before they could spawn. Anglers also caught and killed a considerable number of fish. By 1995, however, the net fisheries had been stopped or severely curtailed and anglers were releasing many of the salmon that they caught. Some key dates for changes in the fisheries are indicated in Figure 2. Each of the management measures was expected to result in an increase in the number of fish returning to the traps. Unfortunately, however, the effect of each successive measure was matched or exceeded by increasing total (largely natural) mortality in the ocean.

By 1997, the proportion of smolts surviving to spawn reached its lowest level. Since then, however, survival rate has gradually increased. This increase is probably due, in part, to a gradual improvement in ocean conditions. It is certainly partly due to the increasing practise of catch and release. Tagging studies show that released fish survive and that they go on to spawn. Catch and release is effective.

Analysis of smolt trapping data shows that 30-40 female spawners are required each year to fully stock the stream with young salmon. Figure 3 shows that in every year from 1997 to 2003 the number of female spawners fell below this minimum requirement despite the prevalence of catch and release. Of course, the situation would have been even worse in the absence of a catch and release policy.

Indeed, we can calculate the benefits of catch and release to the Girnock Burn. A variety of studies show that anglers catch about 30% of early-running salmon. Knowing also the proportion of salmon that were released by Dee anglers, we can estimate the number of fish that would have returned to the Girnock Burn if catch and release had not been practised. These numbers are also shown in Figure 3. It can be seen that catch and release has contributed a substantial number of fish to spawning at a time when they were sorely needed.

In 2004, the number of spawners in the Girnock Burn was more than adequate for the first time since 1996. This picture has been repeated in 2005. The improvements were due to a combination of three factors – the increasing practise of catch and release, gradual decreases in natural mortality in the ocean and, in the case of 2004, an unusually large run of smolts two years earlier. All these figures were produced by intensive monitoring of a small stream in the upper Dee catchment in which early-run fish spawn. The picture that emerges from the shorter time series



The Girnock traps. The fence in the foreground guides adult fish into the adult trap on the left. The smolt trap can be seen in the background.

for the Baddoch Burn, 20 miles further west, is rather similar. Moreover, separate studies of all the eastern Scottish rivers show that, in the past, the fortunes of their spring fisheries have tended to rise and fall in concert. Any changes in marine survival that are evident in the Dee catchment are correspondingly likely to apply elsewhere.

It is possible that the recent increases in marine survival are early signs of a welcome trend that signals the start of a general recovery on upper Deeside and elsewhere – but several more years must elapse before this can be established with confidence. Even then, all the fishery closures of past years, and the introduction of catch and release, have spared fish for spawning that would otherwise have been killed. Taking this into account, the number of fish heading from the ocean towards the monitored streams on Deeside can still only be a small fraction of the numbers that did so just 20 or 30 years ago.
A cautious approach to management is still therefore essential. This is particularly important because adult springers are four or five years of age when they finally return to rivers and the benefits of any improvement in spawning take a correspondingly long time to feed through to the next cycle of the fishery. Bearing all this in mind, anglers fishing during the spring months will probably conclude that it is still too soon to risk any reduction in the effectiveness of catch and release policy. One of the hoped for rewards for continuing restraint will be that populations of spring salmon, and the fisheries that depend on them, will recover their former vitality at the earliest possible time.

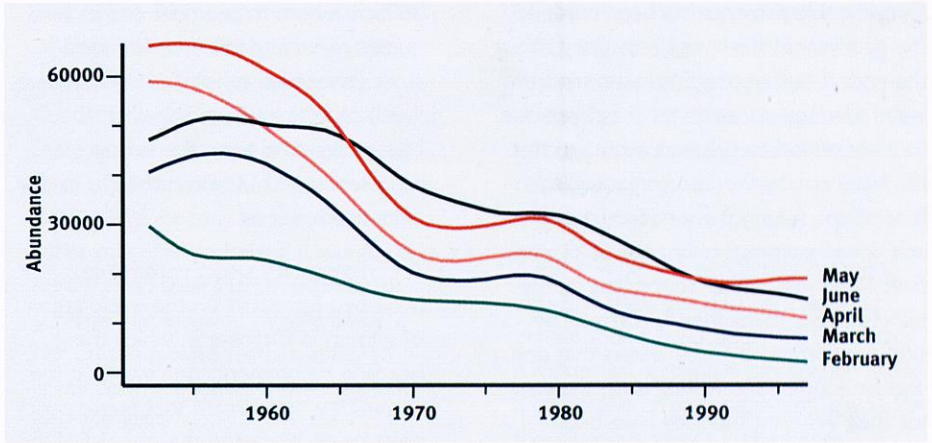


Figure 1. Pre-fishery abundance of early-running, multi-sea-winter salmon for each of the spring months: 1952-1997.

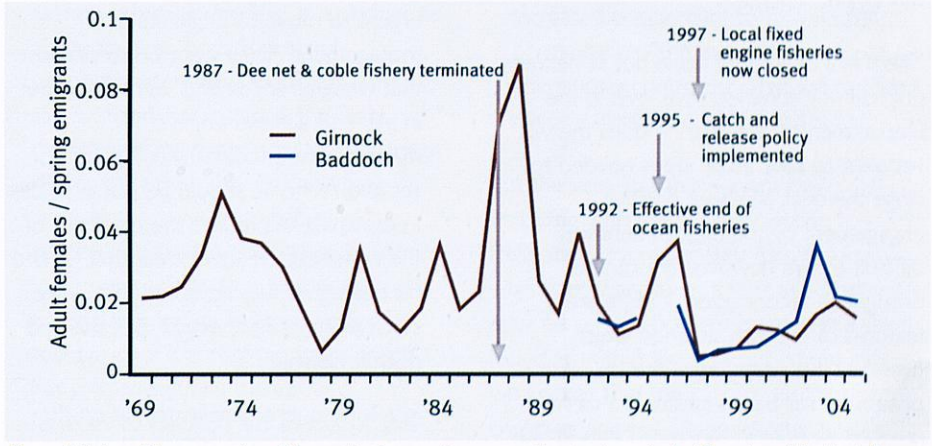


Figure 2. Index of the proportion of the smolts from each year surviving to spawn in the Girnock and Baddoch Burns.

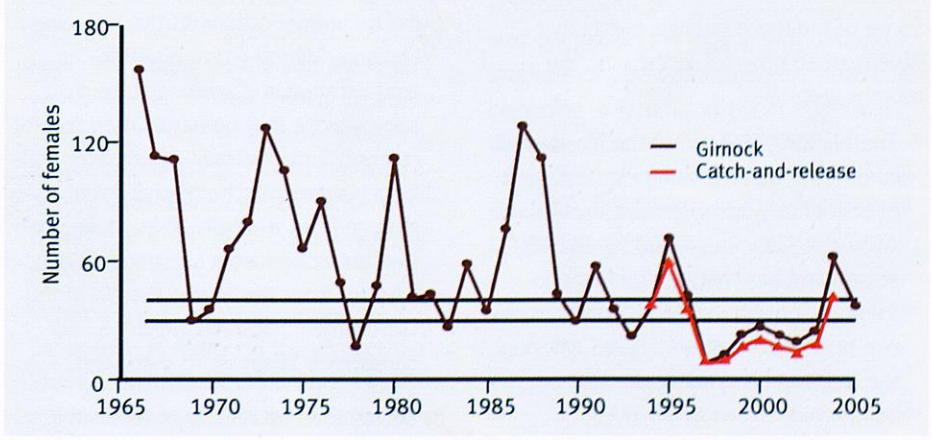
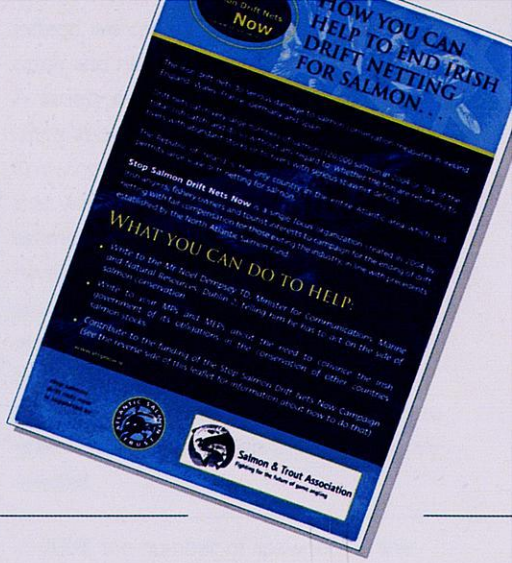


Figure 3. The number of adult female fish returning to the Girnock Burn (brown) and the numbers expected without catch and release (red). The target level of 30-40 spawning females is also indicated.

Irish Drift Nets



Niall Greene, 'Stop Salmon Drift Nets Now' campaign, AST member

Considerable progress has been made in the past year in the struggle to bring about the end of drift netting for salmon in Irish waters. In large measure this has been due to a concerted, facts based campaign that has been run by the Irish game angling federations, fishery owners, tourist interests and conservationists under the *Stop Salmon Drift Nets Now* banner, supported by the efforts of our many friends abroad. The drift net community itself knows that one way or another the writing is on the wall for their industry and they have been coming up with their own proposals for a retirement scheme.

There is a deal to be done but at neither political nor administrative level in the Department of the Marine does the will yet exist to take those steps needed to close the deal. Without positive engagement by the Department it is difficult to see how matters can be brought to a conclusion – there are features of the Irish situation which preclude the adoption of the largely private sector based initiatives that have recently worked in Northern Ireland and the north east of England.

Some of the more notable events that have marked progress in the past few months are:

- The Minister of State for the Marine has committed himself to the establishment of scientifically based district level Total Allowable Catches (TACs) for the 2007 season and has charged the National Salmon Commission (NSC) with advising him how this is to be achieved. Ignoring the fact that his predecessor had committed himself to achieving alignment with the scientific advice in 2005, it is hard to see how district level quotas make any sense while mixed stock fisheries in other districts continue. It will be interesting to see what the NSC make of it, given the strong representation of the commercial sector in its deliberations.
- A parliamentary select committee published its report on the exploitation of salmon in October in which the headline recommendation was that the committee "is adamant that public policy must be dedicated to the survival of the salmon species and in this regard it is urgent to move to single stock management". They went on to propose that while arrangements were being put in place to achieve single stock management a voluntary retirement or set aside scheme should be put in place. In launching the report the chairman of the committee made it clear that he and his colleagues fully accepted that single stock management would spell the end of drift netting.
- In a subsequent Senate debate on the report the Minister of State for the Marine announced that he was referring the recommendations to the incoming National Salmon Commission for its consideration and advice but he did acknowledge that he would have to respond "pragmatically" to any proposals for a retirement scheme that might emerge from the NSC. Pretty luke warm stuff but nonetheless a considerable advance from the "not in the life of this Government" position which he had consistently taken up to that point.
- Within the past couple of weeks the Irish Government has acknowledged that the requirements of the EU Habitats Directive must be adhered to in salmon management and that the NSC must take account of them in giving advice to the Minister. Provided they are followed conscientiously it is hard to see how drift netting could survive the application of the terms of Article 6 of the Directive to the establishment of the salmon TAC.
- The Directorate General for Fisheries is involved in a major review of interceptory fisheries for salmon in the EU. They would appear to have in mind some regulatory regime for salmon in the inshore area analogous to that which they are introducing for eels. Governments, like the Irish (and the UK), who have little enthusiasm for such an outcome know that they will have to move with pace to head off the Commission's entry into this area.
- In a surprising display of courage the Government has announced the dismantling of the current structure of a central and seven regional fishery boards and their replacement in 2006 with a unitary national authority. While this is controversial and by no means universally welcomed in all angling circles, there is no doubt that it is virtually an essential foundation for future salmon management – currently there are seven sets of largely autonomous salmon management policies and practices being followed around the coast.
- In June the Irish Hotel Federation joined with other tourist interests in calling for an end to drift netting and calling attention to the huge damage that was being done to Irish game angling tourism.

Niall Greene and Mike Egan (left and right) of Stop Now *presenting a letter to the Minister for Tourism, John O'Donoghue TD (3rd from right) watched by (l to r) John McGuinness TD, Pat the Cope Gallagher TD, Minister of State for the Marine and Noel O'Flynn TD (chair of the parliamentary committee that reported in October on salmon exploitation).*

Pictured are some overseas visitors to the rally with Niall Greene, chair of Stop Now *(extreme right): (left to right) Graeme Harris, Gareth Thomas, John Slader and Paul Knight.*

- The junior partner in the current Government, the Progressive Democrats, published a comprehensive policy on drift netting in September which committed them to the ending of drift netting. That leaves the main Government party, Fianna Fáil, as the only Irish party that does not have a policy on phasing out the mixed stock fishery – the mainstream opposition parties, Fine Gael, Labour and the Greens, all have positions that are rather similar to the Progressive Democrats.

Despite all of these developments, and others, pointing in the right direction and notwithstanding considerable support within the Cabinet itself for a resolution to what has become a major domestic and international political problem for the Government, the Minister for the Marine searches for every possible opportunity to kick to touch while assuring the world that progress is to be measured in such steps as the reference of complex issues, beyond their capacity to resolve, to the NSC.

So why does the "private sector" not take the bull by the horns and do the job itself? A good question and the response to which one hopes is not born of some Hibernian failure of imagination and vision!

The Irish situation has some features which dictate the necessity for a major role by the State in bringing a resolution to the drift net question:

- Since Scotland in 1962 (which involved no compensation) no one has attempted the ending of a mixed stock fishery as large or as complex as the Irish one. The scale of compensation alone, some Euro 20 to 30 million in the estimation of *Stop Now* and much larger in the minds of the drift net community, demands that there be not only a major State contribution but probably some form of State underwriting of the entire deal. Whatever may be the mindset in other countries, in Ireland it would be hard to find takers for a withdrawal scheme that involved people taking a risk on the private sector's ability to continuously raise funds over, say, a five year period.
- The very fractured nature of Irish salmon fishery ownership is such that its ability to raise funds is probably proportionately very much less than in, say, Scotland. For instance, the State, directly and indirectly, is by far the largest owner of salmon fisheries and may account for as much as half of all the salmon producing water in the country. When you add to that factors such as the serious decline in game angling tourism over the past ten years which has greatly reduced the ability of fisheries to invest in any aspect of their future and deep scepticism about the diligence with which issues such as protection will be approached in a post legal drift netting regime you are faced with a severely limited funding capability. The best guess of what the private sector, including anglers, may be able to raise is some Euro 2 to 2.5 million per annum – and it is probably at the lower end of that scale.
- While a good deal of it is more on paper than in reality on the ground, the Irish commercial fishery is quite heavily regulated. This will have to be adjusted as operators withdraw so that, for instance, State licences are suppressed and district TACs adjusted to reflect the catching capacity that has been retired. That may even require legislative change and without formal arrangements there could be no credible scheme in which anyone would want to invest.
- If, even within the constraints outlined above, there is going to be a significant private sector contribution to the cost of a retirement scheme it can only be within a comprehensive management regime for the salmon resource in the future. Without that regime the benefits of increased escapement to spawn cannot be maximised and exploitation cannot be scientifically controlled. That will require a major engagement by the State.

But the very fact that we are now grappling with these issues, while frustrating, is a major step forward from where we were even a year ago. There is now no serious body of opinion in Ireland, including within the drift net community, who argue that the current situation can continue. The EU Commission is heavily involved, drift netting is firmly on the political agenda and public opinion is strongly behind the ending of the mixed stock fishery. Everyone, including anglers, is beginning to face up to the changes and disciplines that will be needed to restore Irish salmon to abundance and to end the plundering of salmon returning to neighbouring countries.

We're getting there!

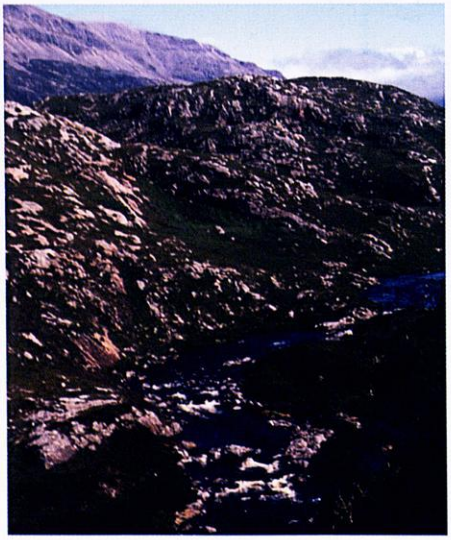
Rivers & Fisheries Trusts Scotland

RIVERS & FISHERIES TRUSTS OF SCOTLAND
(RAFTS)

Sarah Bayley, Director RAFTS, AST member

RAFTS (Rivers and Fisheries Trusts Scotland) has been established to represent all the River and Fisheries Trusts operating in Scotland. Our core objective is to conserve and enhance freshwater fish in their natural environment through the endeavours of all our member Trusts; the latter include Fisheries and Rivers Trusts as well as Foundations, all of which are registered charities.

RAFTS evolved out of the Association of West Coast Fishery Trusts (AWCFT). The AWCFT was formed in 2001 to provide back-up for the work of nine Fisheries Trusts (covering the west coast of Scotland) – helping them to present a co-ordinated and consistent approach to fisheries research and management and relieving them of some of the fundraising burden. As the network of Trusts spread geographically in 2004, so the need for a broader support organisation became apparent and in January 2005 RAFTS formally took on this role.



River Laxford

The objectives of RAFTS include the raising of funds for its members, the facilitation of a forum for information exchange, the development of good practice for a range of activities, the furtherance of political and economic influence and the creation of educational opportunities.

RAFTS has the following member Trusts:

- Galloway Fisheries Trust
- Ayrshire Rivers Trust
- Clyde River Foundation
- Loch Lomond Fisheries Trust
- Argyll Fisheries Trust
- Lochaber Fisheries Trust
- Wester Ross Fisheries Trust
- Western Isles Fisheries Trust
- West Sutherland Fisheries Trust
- Kyle of Sutherland Fisheries Trust
- Cromarty Firth Fisheries Trust
- Ness and Beauly Fisheries Trust
- Spey Research Trust
- Deveron, Bogie and Isla Rivers Charitable Trust
- Dee Salmon Fishery Trust
- Forth Fisheries Trust
- The Tweed Foundation

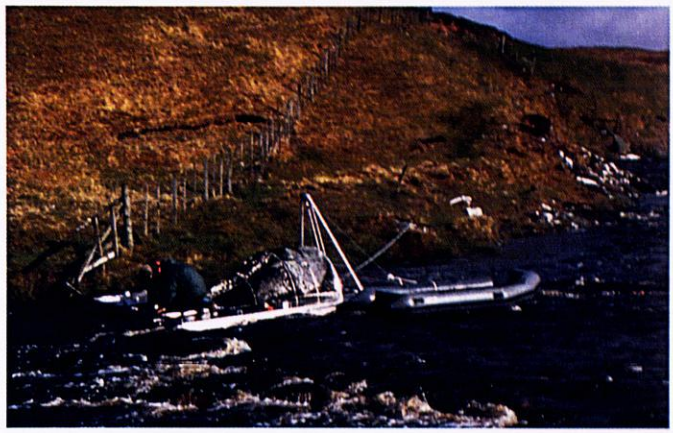
RAFTS is currently working with two additional affiliated Trusts (Don Fisheries Trust and the Tay Foundation) to bring them into the membership and has also been helping to establish new Trusts such as the fledgling Ness and Beauly Fisheries Trust. To facilitate expansion RAFTS, with assistance from its sister organisation the Association of Rivers Trusts in England and Wales (upon which there was an article in the Summer 2005 Journal – Ed), has produced template governance documents and guidelines on the setting up of Trusts.

RAFTS membership currently represents some 80% of Scotland's river catchments.

The Trusts contribute to river and fishery management for the benefit of all fish within and native to their own particular area. In line with their constitutions, Trusts are equally representative of both proprietorial and community interests.

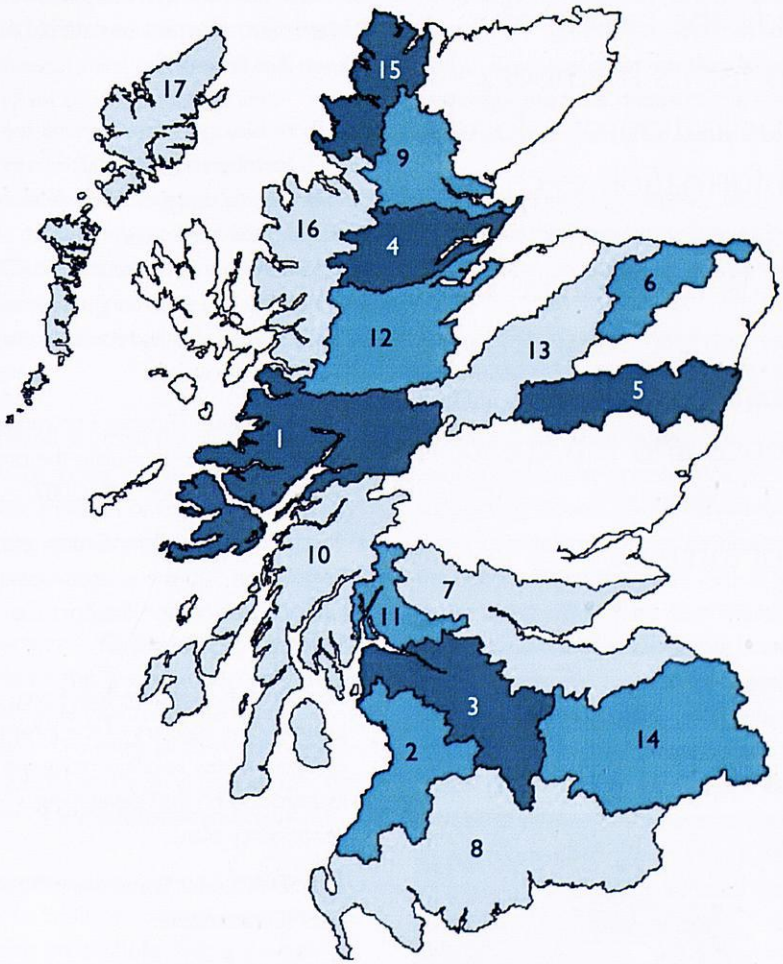
Many of the member Trusts were established to address the major (and in some areas catastrophic) decline in fish numbers in the last 20 years. They research and collect scientific information to provide objective advice for fishery and riparian owners/managers, produce River and Fishery Management Plans, and undertake restoration work with a view to reversing this decline. Each Trust employs one or more highly qualified biologists, who collect scientific data on fish stocks, health and habitats; this information is collated on a national database by the Scottish Fisheries Co-ordination Centre (SFCC), based at the Freshwater Fisheries Laboratory by Pitlochry. This accumulation of knowledge is vital for the successful implementation of fish restoration initiatives and habitat management. The Trusts design and manage practical projects, such as habitat enhancement, improvements to water flow, and the removal of obstacles both in rivers and on their banks. They also engage in an enormous range of related activities, often supported by suitably trained volunteers from the community.

Our members are responsible for the hugely successful "Salmon in the Classroom" scheme for Scotland's primary schools, in which children take on



Removing smolts from rotary screw trap on the River Tirry – part of a major project to determine smolt survival as they migrate through Loch Shin.

RAFTS Network of Trusts



1. Argyll Fisheries Trust
2. Ayrshire Rivers Trust
3. Clyde River Foundation
4. Cromarty Firth Fisheries Trust
5. Dee Salmon Fishery Trust
6. Deveron, Bogie and Isla Rivers Charitable Trust
7. Forth Fisheries Foundation
8. Galloway Fisheries Trust
9. Kyle of Sutherland Fisheries Trust
10. Lochaber Fisheries Trust
11. Loch Lomond Fisheries Trust
12. Ness and Beauly Fisheries Trust
13. Spey Research Trust
14. Tweed Foundation
15. West Sutherland Fisheries Trust
16. Wester Ross Fisheries Trust
17. Western Isles Fisheries Trust

temporary "ownership" of hatching fish eggs, before returning the young fish to their natural environment, carefully supervised by our biologists. We also provide training for fishing guides in the Western Isles.

River, inshore aquatic and catchment area management has traditionally been the responsibility of riparian and land owning interests through the District Salmon Fishery Boards (DSFB). Over the last 140 years, these Boards, which cover most of Scotland's rivers, have been granted various statutory powers and have been responsible for the protection and improvement of fisheries (including where necessary the stocking of systems with salmon), for the easing of fish migration and for the policing or 'bailiffing' within their areas of responsibility. Their work has also evolved into carrying out research and development programmes.

Historically, DSFBs have successfully managed the proprietorial interests of owners and other interested parties. However, modern political reality and legislation require a broader approach and a more transparent and inclusive style of catchment area management involving the wider community. This now includes greater rights of access to the countryside for the wider population.

In many instances DSFBs have assisted with and indeed been the driving force in the establishment of Trusts or Foundations to facilitate the cause of wider representation in their management practices. Whilst there is a clear demarcation between the interests of the two types of organisation and, although Boards and Trusts may have

Electro-fishing

common or even similar objectives, they employ quite different strategies to achieve them. There is substantial political pressure, which may in due course become an obligation, from the Scottish Executive for every DSFB and Trust to alter their management structures to promote increased community involvement. The devolvement of responsibility for specific research, habitat restoration and enhancement and educational projects to Trusts is considered to be an acceptable and effective way of demonstrating compliance and encouraging wider representation.

The Trusts are inclusive organisations with a remit to protect and enhance the aquatic habitat and use their influence to address any factors, which may have an adverse impact. Trusts are all species orientated. It is hoped that the gradual merging of objectives and interests between DSFBs and Trusts will create a model for the development of long term freshwater species and habitat management policy currently under consideration by the Scottish Executive.

Trusts are ideally placed to provide relevant scientific and economic research, the identification and delivery of improvement projects to benefit species, habitat and environmental issues and the delivery of broad educational programmes throughout the community. All of this needs to be achieved without prejudicing the statutory obligations incumbent upon DSFBs.

RAFTS has developed a highly innovative website: **www.rafts.org.uk** This is an extremely versatile vehicle for the use of

The objectives of RAFTS include the raising of funds for its members, the facilitation of a forum for information exchange, the development of good practice for a range of activities, the furtherance of political and economic influence and the creation of educational opportunities.

RAFTS and its members and the dissemination of relevant information to a wider public. The website has the capability to host microsites for each of its member Trusts as well as links to the existing Trust websites. Surveys, data, newsletters, reports will all be available on the site and made accessible to either the general public or to password protected groups.

Since its formation RAFTS has produced both a comprehensive Business Development Plan and a Fundraising Proposal to strategically plan for the future. RAFTS is developing national projects with its membership and has also been helping the Fisheries Trusts produce project applications and fundraise at a local level. It provides an administrative centre to help co-ordinate and manage collaborative, national and international projects across the Trust network. This currently involves a Trust wide project, funded by the Scottish Executive Environment and Rural Affairs Department, and the international Atlantic Salmon Arc Project.

RAFTS or biologists representing the RAFTS membership take part in a number of initiatives to represent the views of the Trusts and aid communication and information flow between the RAFTS membership and other organisations. In 2005 RAFTS and its representatives played pivotal roles in:

- The Freshwater Fisheries Forum Steering Group, helping to formulate the proposed new Fisheries Bill for 2006/2007.
- The Tripartite Working Group and its Restoration Sub-group in co-operation with the Restoration Support Co-ordinator (AST Biologist).
- The Scottish Executive Task Force assessing the dangers of the introduction of *Gyrodactylus salaris*, limiting the risk of its introduction and developing contingency plans.
- The SEPA Water Framework Directive SAEMS committee.
- The Scottish Fisheries Co-ordination Centre Committee.

RAFTS Conference

The first RAFTS conference, which will showcase the work of the Fisheries Trusts and include key speakers from the fisheries management sector, will take place on the 10th March 2006. If you would like to register your name to receive further information regarding the conference please email: info@rafts.org.uk

FishScotland

What originally started as an enterprise to let beats on the Tweed is fast becoming a Scotland-wide franchised marketing organisation covering all the main salmon rivers, species and angling types.

Ian Wood, Marketing Manager, FishScotland

Scotland is a name synonymous with malt whisky, stunning scenery and warm hospitality. Combine this with truly world-class salmon fishing and you have a powerful incentive to make a visit.

What an idyll, fishing in the spiritual home of salmon fishing; but how does one get onto the great and varied rivers in Scotland? To complement the fishing, there is now an innovative marketing organisation which can help you fulfil this desire.

FishScotland set itself the challenge to get all types of fishing online. Yes, the internet – that most modern of technologies – will eventually unite one of the most ancient of sports, angling.

What originally started as an enterprise to let beats on the Tweed is fast becoming a Scotland-wide franchised marketing organisation covering all the main salmon rivers, species and angling types under the umbrella of **www.fishscotland.co.uk**

The website allows potential angling visitors to Scotland to track exactly what's happening on a whole river and where best to find their chosen sport.

For the thousands of anglers travelling to Scotland each year, salmon is the most highly sought after quarry. Consequently salmon was the first to have its own state-of-the-art dedicated website. Salmon runs can be tracked as browsers monitor the progression of salmon catches along the river. There is even a specified instant catch reporting monitor for each individual beat on the river. By no means is the system foolproof, and the best any angler can hope to do is be in the right place at the right time – the fish may well not turn up but if you know where they were yesterday and have details of the river condition you stand a far better chance.

FishScotland also has websites set up for sea trout, coarse fish, grayling and trout (both Stillwater rainbow and wild brown trout).

In 2004, the Scottish Executive commissioned a report which calculated that all types of freshwater angling netted £113m for the Scottish economy making angling one of the largest employers supporting around 3,000 livelihoods. The direct correlation that can be drawn from the report is that the more people who come and try the world-class fishing Scotland has to offer, the better for the Scottish economy with the revenue generated being invested in tourism as well as important conservation efforts.

The world wide web allows information to be provided in real time which makes it a powerful tool. Anglers and others can access the site worldwide and choose the area of Scotland they would like to fish, the species they want to catch, the price they are prepared to pay and the preferred date(s) of fishing. The angler can then look at yesterday's information today and book for tomorrow, it really is that simple. Booking is done online through secure servers and once the booking is completed an e-mail confirmation is sent to the anglers' e-mail address. Simultaneously the ghillie and fishery manager are automatically notified of the booking. For those who would rather not pass payment details over the internet, they may telephone into the call centre, during office hours, and one of the knowledgeable staff will assist with the booking.

How does all this technology work you may ask? Each beat and each ghillie are

River Tweed – Fairnilee

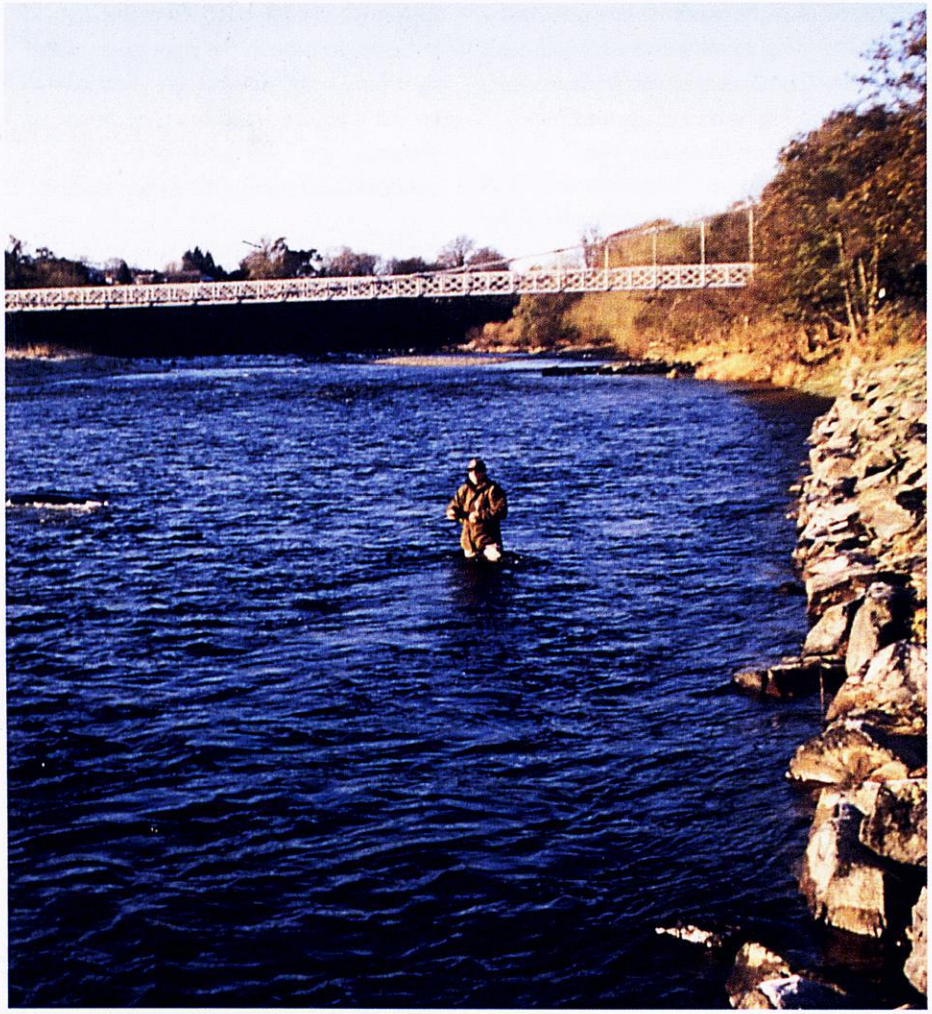
FishScotland website homepage

allocated their own individual login codes so they can update the website on demand, whether adding additional rods (or removing rods for bookings taken directly) or updating catches the moment they happen. Ghillies can send an SMS text message from their mobile 'phone to the dedicated server and catches are updated automatically.

Prospective anglers can also use the website to keep abreast of conditions of where they propose to fish by registering to receive weekly reports of the past week's fishing.

No angler can catch fish without sufficient water in the river system and whilst this is easy for the local angler it is far more difficult from a distance away. FishScotland takes river level data automatically from the Scottish Environment Gauging Stations on the various rivers, twice daily at around 7 a.m and 7 p.m each day which gives details of the current river height and whether this is rising, falling or steady. Anglers can also, for a modest fee, subscribe to receive this information by SMS text message or by e-mail in advance of and during their fishing trip.

The FishScotland website is also designed to provide information to both the experienced and novice angler with details on when to fish, where to fish – including details of the beats on each river along with their respective letting conditions – tackle required (and where to obtain it), accommodation, listings of trout and coarse fisheries, listing of guides/ghillies/ instructors and information of disabled access for less able anglers.



River Tweed – Lower Pavilion

The first FishScotland franchise was FishTweed and this was quickly followed with franchises for the Tay, Dee, Esks, Hebrides, Spey and Annan. The Findhorn and the Don are expected to be online in time for the 2006 season.

FishScotland also works closely with VisitScotland and now provides the pages for their fishing website (**www.visitscotland.com/fish**). We take stands at game fairs and other exhibitions and trade events in Scotland and England to promote fishing to people who might not otherwise have thought of coming to Scotland.

Scotland truly has some world-class fisheries and a huge variety of fishing to choose from, in terms of price, location and species.

Scottish Fishing Review 2005

... for most rivers 2005 has been another reasonably productive year and it is likely that the total rod catch will exceed 80,000.

Andrew Graham-Stewart, AST PR Consultant

Scottish rod catches in 2005

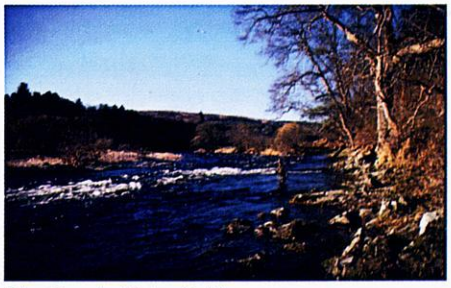
In recent years rod catches of salmon in Scotland have fluctuated dramatically, underlining the importance of long-term trends rather than isolated years when it comes to the use of catch figures as indications of stock levels. The 2003 season (with the longest drought for 50 years) produced a desperately low rod catch of just 52,000. 2004 saw a marked turnaround with anglers landing almost 93,000 – the second highest figure since consistent records began in 1952 – with several rivers having their best-ever year. Whilst this is written at the end of November 2005, before many catch returns for the season have been collated, it is clear that for most rivers 2005 has been another reasonably productive year and it is likely that the total rod catch will exceed 80,000.

For the second year running the grilse runs have been late. In 2004 they were two to three weeks behind schedule but this year they were generally some four weeks late; concern (and in some instances panic!) amongst river workers that they would not appear proved to be unwarranted. Generally speaking, the main summer grilse runs started in the second half of July and continued through most of August and often into September. August, which has traditionally been a 'doldrums' month (with little happening), can now be as productive as July.

On the negative side the presence of considerable numbers of long thin ('eel-like') grilse has been a cause for concern. The problem has not been consistent either within rivers or indeed between rivers although it is apparent that a sizeable percentage of this year's grilse failed to find sufficient food in the period before they returned from the sea. In this context it is worth noting that, most unusually, many grilse caught in the Montrose area coastal nets were full of sandeels; one can only presume that, as their reserves were so depleted as they approached their rivers of origin, they took advantage of last minute inshore feeding opportunities. In contrast this year's multi-winter salmon (whose marine feeding grounds differ from those of the grilse) were in superb condition and on most rivers there seemed to be more heavy fish in evidence – over 20lb and occasionally over 30lb.

Below I have summarised the 2005 season over much of Scotland.

Tweed



River Tweed – Upper Caddon

Spring fishing was bedevilled by unsettled and/or yo-yoing water conditions (generally high or very high) and inevitably catches were restricted accordingly. Stocks of fish were more than adequate but they were spread through the system far more than has been the case in recent years. The total rod catch between February and the end of May was estimated at around 1500. July and August were afflicted by low water; the odd lift in levels was never enough to give the river the thorough scouring it needed. The low water and the summer heat encouraged a profusion of weed and algae and fishing was really restricted to the lower beats. There was no change (and no meaningful precipitation) in September and consequently the autumn season got off to a slow start with most sport still concentrated on the lower river. In fact there was no relief until October 12, which saw a massive spate; the rest of the month remained wet with several days 'lost'. November was rather more satisfactory but conditions in the previous two months conspired to restrict the season's total catch to rather less than the previous year's record of over 15,000.

Tay

Catches to the end of April (approximately 1000 for the system as a whole) were amongst the highest for several years, partly reflecting the fact that fish were well dispersed through the system. Thus the Tummel had its best spring for many years. Between early May and late June the main stem of the Tay was beleaguered by excessive water levels, rendering effective fishing virtually impossible; some prestigious beats hardly landed a fish during this period. This culminated with a 6ft rise on June 20th. The odd grilse was showing by the latter part of June but they were comparatively scarce up until late July. When the main runs eventually arrived, it was to the considerable benefit of the August fishers; indeed some beats had their best August for several years. The petering out of the summer grilse runs

River Lochy, Autumn Run

River Nith, Friars Carse Hotel Water

coincided neatly with the start of the autumn runs; indeed fishing was 'steady' from late July right through to the end of the season. Catches in September were excellent, particularly on the lower and middle beats of the main stem; the total for the month off the whole system was in the order of 3000. Water was plentiful in October and in the first week catches amounted to approximately 1000. It was estimated that the total for the year was close to 10,000. The counter on the Ericht tributary to this date showed an upstream migration of some 11,000 (the third best figure since 1990). The counter at Pitlochry showed a normal (average) run.

North and South Esk

River South Esk

This was the first year of the five year conservation order obtained by the Esk District Salmon Fishery Board preventing the coastal nets within the district from operating before May 1st. As a consequence there appeared to be many more spring salmon in the North Esk and with some unseasonably high water temperatures they were not held back by Morphie Dyke. There was also a better run into the South Esk. However, when the nets came on at the start of May, numbers entering the rivers dropped dramatically; by mid June salmon were very scarce in the North Esk and sea-trout were practically non-existent in the South Esk. Low water prevailed in July. Some beats on the South Esk enjoyed fair catches of sea-trout but overall they have not been plentiful this season (probably the worst runs for 10 years or so). They were also scarce on the North Esk where the West Water (the renowned sea-trout tributary) seemed to be almost totally devoid of fish. The grilse finally arrived in fair numbers in late July and on the North Esk the lower (mainly tidal) beats scored. The long drought persisted during September and it was not really broken until the 11th/12th October when spates descended both rivers, injecting life into all beats and giving some perfect conditions to make up some of the numbers lost during the low water.

Dee

The consensus is that the spring runs on the Dee are making a steady recovery. Prior to February it had been a particularly mild winter and over 20 springers were caught on opening day. Following snowfall on February 12th, a very cold spell set in, holding fish back and thus benefiting the lower beats. This pattern continued in early March, when the upper river froze over. In the middle of the month a sudden thaw launched a 5ft spate, following which there was some first class sport. The total catch for the river for March was close to 500. April was slightly more successful despite a mixed bag of weather conditions (from snow to shirtsleeves). There was no let up in May with close to 700 recorded by rods. By the end of the May the rod total for the season to date was approximately 2000. The heady days of the 1950s and 1960s are still a long way off (between 1952 and 1960 the rod catch up to the end of April averaged 5337) but this year's figures are certainly encouraging. Up until the end of June catches were even better than those of 2004, which had been the best season for 15 years. However the next six weeks were dry; the saving grace was the fact that the weather was generally on the cool side. Grilse continued to trickle in steadily, populating the lower beats, where, in the absence of glaring sunshine, fish were caught consistently. Levels were low in September (with the odd mini rise); reasonable numbers were caught as far up as Aboyne although inevitably the majority were taken below Banchory. The provisional season's total was some 5000 (of which over 90% were voluntarily released) – up on the five year average.

Spey

Early in the season conditions were difficult for the traditional spring beats as fish ran through. Colder weather prevailed in early March, culminating in a heavy snowmelt flood later in the month. During this period and for most of April low water temperatures benefited the beats below Carron Bridge. The total rod catch of salmon up to the end of April was 840, compared to 1100 for the same period in 2004 and the ten year average (1992-2001) of 600. During May and June beats as far up as Castle Grant and Grantown started to pick up fish in fair numbers. As the drought set in during July, catches of early grilse (limited in numbers) were concentrated in the lower reaches. As elsewhere the main runs were late

River Spey – Upper Knockando

Loch of Stenness, Orkney

and high water temperatures (up to the mid 70s at one point) contributed to some difficult angling conditions. fish were reluctant to move upstream of Craigellachie before mid August when lower temperatures and the arrival at last of the main grilse runs prompted a good head of fish to push upstream as far as Grantown. August tenants enjoyed some prolific catches and the beats continued to fish well in September. The season's total for the river as a whole was some 9700, just marginally down on the figure for 2004 and comfortably above the ten year average of 9100. Sea-trout were scarce but at least there were large shoals of finnock.

Highlands

There was little discernible pattern to this year's spring catches on the northern rivers. Some did well whereas others were mediocre at best. Unseasonably warm weather in February and March rendered temperature barriers redundant with salmon forging much further upstream than is normally the case. Thus on the Findhorn the beats below Poolie Falls really struggled; the Oykel was similarly affected. The Ness system's main spring tributary, the Moriston, had an excellent four months including many in the 20lb class with the best at 27lb. The far north's premier river, the Helmsdale, had an average spring up to the start of May. Thereafter the beats landed a prolific average of 50 per week, contributing to a remarkable spring total of some 500. Low water dogged the summer fishing on many of the east coast and north coast rivers. There were exceptions on those systems where the headwaters are close to the west coast as well as those with adequate stored water. When the main grilse runs arrived (some four weeks late) these systems did especially well; for instance the four River Ness private beats had 500 between them in August. The Helmsdale had a strong last three months, boosting the season's total to almost 1900, 100 up on the 40 year average. Other systems were less fortunate in terms of water. Thus the Thurso remained essentially dry from late June to the end of the season, although, considering the adverse conditions, the season's total of 895 was more than satisfactory. Catches in the north-west Highlands, where the summer was very wet indeed, were encouraging in many instances. There were some significant recoveries in several rivers where local voluntary Area Management Agreements (in which the fish farmers and wild fish interests work together to resolve relevant issues, such as the synchronised treatment of lice on the farms immediately prior to the wild smolt runs) appear to be paying dividends. The most spectacular results were on the Lochy, where the year's total was over 1000 – the highest figure since 1982 and a most remarkable turn-around from a figure of just 50 in 1998.

Lewis and Harris

River Creed, Isle of Lewis

Apart from a dry spell in August, the summer was exceptionally wet and windy; at times the September gales made loch fishing impossible. However fish were in plentiful supply and some highly satisfactory results were reported. The Creed system had 241 compared to a five year average of 66. Grimersta produced 572 (five year average 450) and Amhuinnsuidhe had 266 (five year average 107).

Solway

There was a desperate shortage of water prior to October. When the rains eventually came, flood conditions were all too common. On the Nith this ensured that the main catches in October and November were concentrated in the lower beats. The total for the season was thus restricted to close to 3000 compared to the catch of 4150 in 2004. The neighbouring Annan 'lost' some 75% of its autumn fishing due to the surfeit of water. Its annual total was estimated to be considerably above the five year average of 1000 but inevitably nowhere near the record of over 2000 in 2004.

Fishy Dishes

Claire Macdonald

Salmon is such wonderful eating. It is a fish I never tire of, even when I am cooking a salmon dish repeatedly, as I do during our sessions of cooking demonstrations here at Kinloch; when Godfrey and I eat up the demo food salmon dishes, they seem to retain their appeal. Considering that our demos occur about ten times in five weeks, this means eating the salmon dish that often, therefore, that salmon still holds its allure come supper time speaks volumes for the fish. But then, salmon, like all fish, is fast food. Salmon is convenience cooking. It is ruined by overcooking. And better still, unlike that dreaded fast food image which springs to mind at the mention of the words 'fast food', the hamburger bearing the same name as me, salmon is so very good for us. Now, usually when I read about nutritious food, or food which we should eat because it is good for us, I feel a childish urge to consume a Mars Bar, and preferably a deep-fried one, at that. Nutritious food is too often brown, stodgy and fraught with a sense of duty with each mouthful that dispels all possible pleasure. And eating is, or should be, about pleasure. Salmon is pure pleasure on a plate – as ever, though, depending on the cook. Nothing, but nothing, can restore a piece of overcooked salmon to a delicious state. No blanket of the most sumptuous Hollandaise sauce can mask the cardboard texture of the overcooked salmon beneath.

The simplest method to cook pieces of filleted salmon to be served hot was

This recipe is one of my favourites. I thought that making quenelles of whatever type of fish would be way beyond my capabilities. That is, until I was staying with Sebastian and Henrietta Thewes several years ago. Henrietta (and both her sisters, too) is a wonderful cook. She was making salmon quenelles, and with such apparent ease that I asked her for the recipe. So I have Henrietta to thank for this recipe in principle, although the creamy tomato sauce is one I usually make to eat with hot ham, I think it is much better with the salmon quenelles.

Salmon Quenelles

1½ lb/675g salmon, filleted
1 large egg + 2 egg whites
2 anchovy fillets, drained of their oil
½-1 tsp Tabasco
½ pint/300ml double cream
a good grinding of black pepper, a grating of nutmeg

Creamy Tomato Sauce:

2oz/50g butter
1 red onion, skinned
juice of 1 lemon
4 ripe, vine tomatoes, skinned, seeded and chopped
½ pint/300ml double cream
½ tsp salt, a good grinding of black pepper

Put the salmon and anchovies into a food processor and whiz, adding the egg whites, the cream and Tabasco, and the pepper and nutmeg. Whiz till smooth. Scrape the mixture into a bowl, cover, and put the bowl into the fridge for 3-4 hours, or overnight. Make up the quenelles by putting stock to a depth of 2½-3 inches/6-7.5cm into a saucepan. When it has reached a fast boil, with two tablespoons form neat and even oval egg-shapes and slip the mixture into the boiling stock. Poach them for five minutes, turning them over during that time. Butter an ovenproof dish, and lift the poached quenelles with a slotted spoon from the stock and put them into the buttered dish. Cover with their sauce, cover the dish and keep them warm until you are ready to serve.

To make the sauce, melt the butter in a saucepan and sauté the chopped red onion until very soft. Add the chopped tomatoes, lemon juice and cream. Simmer for two minutes, stirring. Take the pan off the heat, whiz the contents in a blender or processor, return to the pan and season with salt and pepper. Pour this sauce over the finished quenelles in their ovenproof dish. Cover the dish, and keep it warm until you are ready to serve. (The chive cream sauce is suitable for the salmon quenelles as well as the smoked haddock ones, but the creamy tomato sauce is a delicious alternative to serve over the salmon dish.)

Quenelles

taught by the chef John Tovey (who owned Miller Howe, in Windermere, during the 1980's) and it is how I cook fish to this day. Simply put the pieces of salmon onto a baking sheet (I use a non-stick one, to make washing up easier) and put a piece of butter, 1oz./25g on each piece of fish, which should be skinless. John never even seasoned the fish with salt and pepper, but I now do, and, too, sometimes with a squeeze of lemon or lime juice also. Bake the fish in a very hot oven, 450°F/(220°C)/ Gas Mark 7 (hottest oven in an Aga) for five minutes. The fish is invariably perfect, succulent within. Beware, though, preparing the pieces of salmon in advance (do, by all means) and taking the baking sheet straight from the fridge to the oven. Allow the baking sheet and its contents 30 minutes at room temperature before baking the fish.

For serving a salmon cold, I was taught by someone who cooked for my parents for years that the salmon is put into a fish kettle and covered with cold water. I add handfuls of parsley, slices of lemon, bashed peppercorns and a teaspoon of rock salt. Bring the water in the kettle to boiling point, simmer the liquid around the fish for just one minute, then take the fish kettle off the heat and leave the salmon to grow quite cold in the water in which it is immersed. When cold, take up the fish, and carefully remove all skin, and cover with the thinnest slices of cucumber, unpeeled, overlapping the slices. Brush them with olive oil, which helps prevent them from drying out and curling up. This method of poaching salmon is infallible.

Baked fillet of salmon en croute, with lemon and shallot sauce

This is a most elegant and delicious – and convenient – dish for a special occasion. Convenient, because the whole thing can be prepared the day before, and baked before serving. The sauce, too, can be made in advance. No other starch is needed to accompany the salmon en croute, in the form of potatoes, or rice. The pastry is enough, and I love fresh garden peas, or sugarsnap peas, lightly steamed, to go with it.

Serves 6

2lb/900g filleted salmon, all bones felt for and removed (any leftover salmon is very good eaten cold, with mayonnaise)
1 ½ lb/675g puff pastry (I use Bell's, or Saxby's)
4 banana shallots, skinned and finely sliced
½ cucumber, skin removed (I use a potato peeler), the cucumber slit lengthways in half, seeds scooped away, and cucumber diced thumbnail-size
2oz/50g butter
½ tsp salt, a good grinding of black pepper
1 egg, beaten

For the sauce:

3 shallots, skinned and very finely sliced
½ pint/300ml dry white wine
finely grated rind of 1 lemon
½ pint/300ml double cream
½ tsp salt, a good grinding of black pepper

For preparing the salmon, melt the butter in a wide sauce or sauté pan, and sauté the diced shallots and the diced cucumber together for several minutes, until the shallots are very soft. Season with salt and pepper. Cool.

Roll out two thirds of the pastry so that it is bigger than the filleted piece of fish by a margin of about 1 ½ inches/4cm. Put the (skinned) filleted salmon on this. Spoon over the cooled shallot and cucumber mixture. Roll out the remaining pastry to an oblong to cover the salmon, and put this over the salmon. Brush around the edges with beaten egg, and crimp the edges firmly together. Put the salmon en croute onto a baking parchment lined baking tray. Slash in four or five places down the top of the pastry top, and garnish, if you like, with pastry fish. Brush the whole thing with the rest of the beaten egg. Cover with clingfilm and put in a cool place, a larder or fridge, until you bake it, in a fairly hot oven, 400°F/200°C/ Gas Mark 6, top oven in an Aga or Raeburn, for 30-35 minutes, or till well puffed up and deeply golden brown.

For the sauce, put the diced shallots into a saucepan with the white wine. Over moderate heat, simmer the wine till it has almost reduced away. Then add the lemon rind and cream, salt and pepper, and simmer until it is as thick as you would like – about two minutes simmering is usually enough, stirring.

Serve the salmon en croute in slices, with a spoonful of the cream over each slice.

For more information or to visit Claire's shop go to www.claire-macdonald.com

Scalereadings

Seymour Monro discusses the finer points of zoology with Professor Padraig O'Casey at Burrishoole.

Activities

As you will have read, the Trust's staff have been energetic on the high seas, on rivers, in research facilities and in committee rooms. We also had a most interesting and enjoyable visit to Dublin and Co. Galway. We work closely with our sister organisations and are delighted that the Association of Rivers Trusts (ART) and the Game Conservancy Trust (GCT) have joined those who send representatives to our Members' Meetings.

Game Fairs

The GCT Game Fair at Scone, lengthened by one day for the first time this year, was a great success as was the Highland Field Sports Fair at Moy. Our display at the CLA Game Fair – in its first year at Belvoir – did not attract the same interest as usual. As this was the experience of others in 'Fisherman's Row', we suspect it was because the local area is more oriented to hunting and shooting. Broadlands should be better!

The Salmon and Trout Association again gave us part of their display area; we are most grateful to them.

Dates for this year are:

30th June-2nd July
GCT Scottish Game Fair, Scone

28th-30th July
CLA Game Fair, Broadlands

4th and 5th August
Highland Field Sports Fair, Moy

Help from Members is always very welcome at these events – please let us know if you are able to give a hand.

Postal Auction 2006

Over 250 donations were made to the Trust for this year's Postal Auction. Pleasingly, there were a significant number of new donors; we are extremely grateful to all donors and to all those who bid. The Auction realised £55,000 in 2005, the best sum ever, and still represents the Trust's largest single element of income. 2006 catalogues were despatched at the end of November; it also appears on the AST website. Bidding closes on 1st February.

Governance

The Trust's Board, in consultation with members, has been considering ways to make the governance more simple and effective. At the AGM on 6th December it was agreed that the 'Committee of Members' tier in the infrastructure should be dispensed with, especially as all members had become welcome at bi-annual meetings. The Board has also decided to abolish the ceiling on membership of sixty. This will allow the Trust the headroom to invite more people to become members and thus broaden representation and the potential for support to the Trust's activities.

David Clarke's Bequest

David Clarke, the AST Chairman from 1983-1988, bequeathed a really wonderful collection of books to the Trust. They are housed in the AK Bell Library, York Place, Perth and looked after by Mr Jeremy Duncan, the Local Studies Librarian. Mr Duncan and Jenny have a list of the books. Mr Duncan's telephone number is 01738 477062.

Trust Publications

All publications are free except where indicated. Postage will be charged for packages over £5.

Salmon Stocks: A Genetic Perspective
N.P. Wilkins

Salmonid Enhancement in North America
D.J. Solomon

Salmon in Iceland
Thor Gudjonsson and D. Mills

Atlantic Salmon Facts
D. 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

Salmon in Norway
L. Hansen and G. Bielby

The Automatic Counter – a Tool for the Management of Salmon Fisheries
A. Holden
(Report of a Workshop held at Montrose, 15-16 September 1987)

A Review of Irish Salmon and Salmon Fisheries
K. Vickers

Water Schemes – Safeguarding of Fisheries
J. Gregory
(Report of Lancaster Workshop)

Genetics and the Management of the Atlantic Salmon
T. Cross

Acidification of Freshwaters: The Threat and its Mitigation
R. North

Scalereadings

'Blue Books' are available FREE!

Strategies for the Rehabilitation of Salmon Rivers
D. 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. Mills £30.00
(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. 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 and Aquaculture Science, Lowestoft November 2001)

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

Trust Shop

Other Books *(a percentage of the sales of 'other books', and the DVD, come to the AST)*

The Salmon Rivers of the North Highlands and the Outer Hebrides *(signed)*
Andrew Graham-Stewart £35.00

The Longshoreman *(signed)*
Richard Shelton £12.00

McSalar
Michael Martin £4.00

Richard Waddington 1910-1999 Autobiography
Richard Waddington £18.00

Upon a River Bank *(signed)*
Derek Mills £9.95

Occasional Salmon
Neon Reynolds £9.50

The Fox and the Orchid
Robin Page £5.00

Atlantic Salmon – an Illustrated Natural History
Roderick Sutterby and Dr Malcolm Greenhalgh £25.00

Other Items for sale:

DVD – 'Atlantic Salmon, a life on the edge' (incl. p&p) £18.99

AST TIES (dark or mid blue)
Silk £10.00 Polyester £5.00

Posters and Postcards

"Salmon Recognition"
Posters £3.00
Postcards (A5 size) 50 pence

"Life Cycle of Atlantic Salmon"
Posters £3.00
Postcards (A5 size) 50 pence

"Threats to Salmon"
Posters £3.00

Poems

"The Best Worker in Europe"
Signed by Ted Hughes, with drawings by Charles Jardine £100.00 (incl p&p)

"Lines from Euston (by one who is not going)"
by A.M. Harbord £5.00 (incl p&p)

Prints

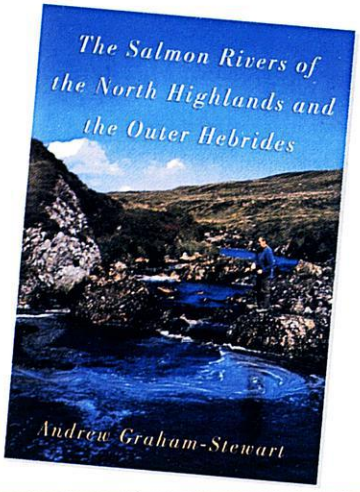
"The Junction Pool, River Tweed"
by Shirley Carnt £20.00

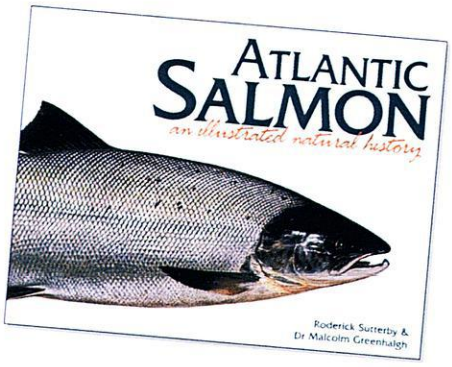
Extra copies of the AST's Journal, leaflets and car stickers are available free

To order, contact
Jenny at the Trust's office:
Moulin, Pitlochry PH16 5JQ
Telephone: 01796 473439
Fax: 01796 473554
e-mail: jenny@atlanticsalmontrust.org

Book Reviews

Both these superb books are available from the Trust's office. A significant proportion of the price of each is being donated to the Trust.





The Salmon Rivers of the North Highlands and the Outer Hebrides

Andrew Graham-Stewart
Robert Hale. 268pp. 102 colour illustrations. ISBN 07090 75898. £35.

It is sometimes said there are two types of angling book – science fiction, and romantic fiction. The latter describes sporting passion, and the former is full of wishful thinking and gobbledegook. My library contains hundreds of examples of each category, and harmless enough they are; but it is also a welcome occasion when a book appears for which there is a genuine need, especially when it has been as well researched and deftly executed as the volume under review.

In this *tour d'horizon* of the waters specified in its title, we are treated to a description of rivers and lochs by region from the Findhorn to South Uist. Where possible, the history of these systems – ownership structure, catch returns, improvements – is traced back to the early nineteenth century, and the author's researches (into the baggy archives of the Sutherland Estate, in particular) will certainly interest all who make a study of the relative values of fish caught by net and angling.

The obvious comparisons here will be with Grimble (1899), Calderwood (1909) and the more recent work of Mills and Graesser. Where Mr Graham-Stewart excels is not just in the marshalling of statistics but in his crisp style and keen eye for anecdote. His entry on the Brora is exemplary, including details of how to fish the slack upper pools, the analysis of a huge 'portmanteau' fish, and a story about a frustrated guest snapping his rod. Good capsule histories of the Conon and Naver are matched by portraits of less storied waters, such as the Polla and Rhiconich. Of the two dozen or so waters known to me, the descriptions seemed authentic, though I doubt my late Uncle (Harold Balfour) would ever have deliberately broken off a fish on the Shin because it appeared too big to land.

The book is well produced, including an index, a compact bibliography, and numerous photographic illustrations. It will be an indispensable reference work for the travelling sportsman, but is also quirky enough to read for entertainment – I especially enjoyed the surgeon who used to carry Dionard fish in tights around his neck, and the Stack sea trout that vaulted into an angler's lap and delivered 'a good clack in the balls.' If Calderwood had not been such a purist, he would be spinning in his grave.

David Profumo (AST Member)

Atlantic Salmon an Illustrated Natural History

Roderick Sutterby and Dr Malcolm Greenhalgh
Merlin Unwin; 144 pp. 54 colour paintings. ISBN 18736 74732. £25.

Of all the fish that anglers pursue there's none so enigmatic as the Atlantic salmon. Trying to tempt a fish to take a fly in its mouth when it is going through a period of not actually eating is just the first part of the riddle that surrounds our king of fish. Which is strange, because as Malcolm Greenhalgh so poignantly observes, the funding and research attracted by the Atlantic salmon is unrivalled by any other wild creature on the planet. This book helps to distil that library of research into what we, as anglers, might like to know about our quarry without the references to research papers in brackets, or standard deviations from the mean.

For instance, what makes a smolt go silver? And how does it cope with the transition from freshwater to sea? What routes do salmon navigate at sea; not just our fish, but those of North America, Canada and the Baltic? And how were their feeding grounds originally detected? And, more mundanely – though just as interesting – how high can a salmon jump?

Dr Greenhalgh has patiently pored over the research and converted the science into a highly readable form of biological facts in easily digestible parts about the salmon's life and behaviour, and, with no lack of humour, occasionally looking deeper into more historical writings just to demonstrate the enduring mystery of the subject … and our innocence and misunderstanding of it.

Of all the fish that anglers pursue, can there be any fish so magnificent to catch? Roderick Sutterby's paintings and sketches not only capture the magnificence of *Salmo salar*, but also the detail. The production of this book has allowed for a lavish use of artwork and colour and, combined with the writings of Dr Greenhalgh, the pair have combined to make a mesmerising duet.

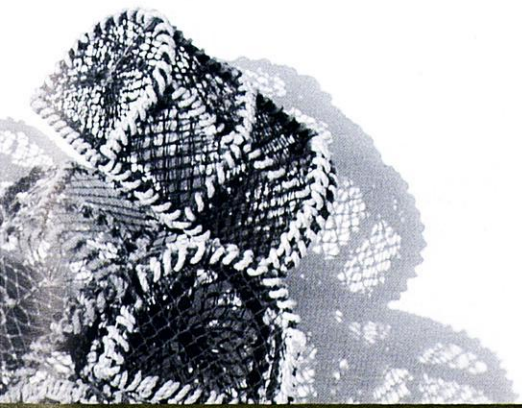
I'm certain that one of the attractions of angling is to view a fish fresh out of the water – even an aquarium cannot give the successful angler's privileged view. Many of our fish species are objects of natural beauty that drains away quickly once they die. Only a fisherman recognises that true beauty, and Roderick Sutterby has managed to capture the glistening vivid greens, blues, purples and lilacs of a fresh-run silver salmon and put it on paper.

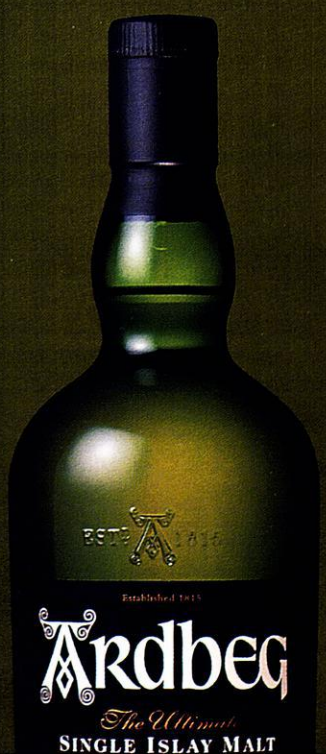
But this is far more than a coffee table book. Every salmon angler should have one as a reference so he can understand and appreciate his quarry more fully. It will doubtless help to settle many a fishing hut argument with its chapters (one page each) on temperatures and running times; tide and wind effects on entering the river; and rain, river height and upstream migration; the demise of large salmon; or, perhaps, the recorded effect of bird predation of smolts. For those who like to deal more in figures, there are compilation tables of the largest Atlantic salmon ever caught.

Captivating and delightful, full of interest but also accurate and topical, this book would make an excellent present for the salmon angler who thought he had everything.

Mark Bowler, Editor 'Fly Fishing & Fly Tying'

loads of body, plenty of legs and a lovely mouthfeel





beg to differ

ardbeg.com

Fundraising

Between April and December 2005, the Trust has spent nearly £50,000 on direct support to the marine and other projects. To increase this level of funding we need **your** help!

The Atlantic Salmon Trust is a charity and it relies almost 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 of specific research or improvement projects and to giving management advice.
- In this Journal you can see what our current priorities are.
- We are not a 'membership' organisation *per se* (we have about 70 invited members), 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 Banker's 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.

  Giving a Legacy – Your Will could express a donation in various ways, eg. The gift of a specific sum of money, a gift of specific assets (such as shares), or a gift of all or a specific part of the balance of your estate once all other legacies (eg. to the family) are taken account of. This is known as the 'residue'.

  Bequests to charities are deducted from the total value of the estate before the calculation of any inheritance tax therefore reducing the total inheritance tax payable.

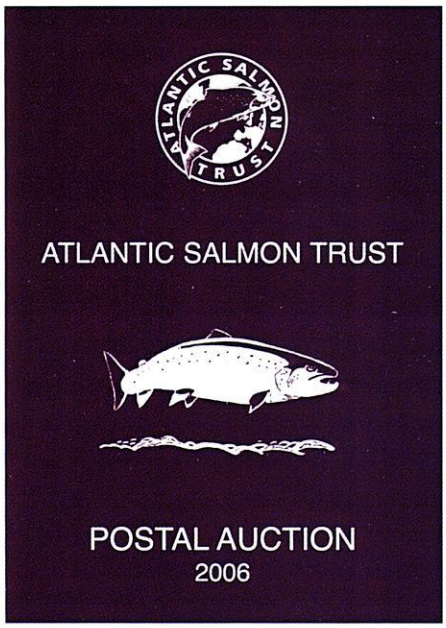
  If you would like to leave a legacy to AST by changing your Will please consult your legal and financial advisors.

  Some families invite friends to **leave the Trust donations in memory.**

  Contributing to our Annual Postal Auction either as a donor or a bidder.

  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 worth while cause.**
- **Please donate and encourage others to do so.** We can supply you with leaflets and other publications for fishing huts etc – free!



- The 2006 Auction closes on 1st February.

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

We are most grateful to everyone who supported the Trust in some way this year.

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 1st May. Quarter, Half and Full page sizes available.

Gift Aid Declaration

THE ATLANTIC SALMON TRUST – GIFT AID DECLARATION

PLEASE COMPLETE IN BLOCK CAPITALS, EXCEPT FOR SIGNATURES

Title Forenames Surname

Address

Post Code

I want the Atlantic Salmon Trust (Registered Charity No 252742) to treat as a Gift Aid Donation:

☐ (a) The enclosed donation of £ _____

☐ (b) All donations I make from the date of this declaration until I notify the Trust otherwise (Please tick as appropriate)

Signature Date

EXPLANATORY NOTES:

- 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.**

THE ATLANTIC SALMON TRUST – BANKER'S ORDER

To Bank Plc Sort Code

Branch Address

Post Code

Please pay to BANK of SCOTLAND, 76 Atholl Road, Pitlochry PH16 5BW (80-09-41) for the credit of

THE ATLANTIC SALMON TRUST LIMITED (Account No 00890858) the sum of £ _____ (_____ pounds)

on the _____ day of _____ 20___ and a like amount on the same day each month/quarter/half year/year

(delete as appropriate) for a total period of _____ years.

Signed Date

Full Name A/c No

Address

Post Code

PLEASE RETURN THIS COMPLETE DOCUMENT TO THE ATLANTIC SALMON TRUST, MOULIN, PITLOCHRY, PERTHSHIRE, PH16 5JQ

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As at 1st January 2006

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The Journal is designed by: Whitespace, Edinburgh and printed by: Woods of Perth Ltd.

Atlantic Salmon Trust, Moulin, Pitlochry, Perthshire PH16 5JQ Tel: 01796 473439 Fax: 01796 473554
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