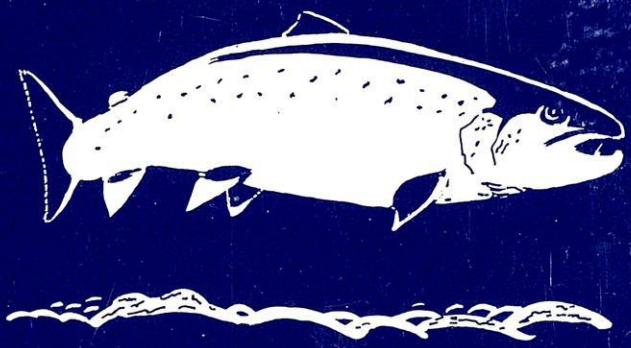
ATLANTIC SALMON TRUST

# PROGRESS REPORT

December 1999



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| ASFB | Miss Jean Matterson |
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K. Whelan, B.Sc., Ph.D. (Salmon Services Division, Marine Institute, Ireland)
Professor Noel P. Wilkins (Department of Zoology, National University of Ireland)
J.H. Webb, MSc. (AST Field & Research Biologist)

Observers:

N. Milner, B.Sc., Ph.D. (Environment Agency)
A representative of the Scottish Executive Rural Affairs Department
E.C.E. Potter, B.A., M.A. (The Centre for Environment, Fisheries & Aquaculture Science)

## INTERNATIONAL CONSERVATION ORGANISATIONS WITH WHICH THE TRUST IS IN CONTACT

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| France: | Association Internationale de Défense du Saumon Atlantique |
| Belgium: | Belgian Anglers Club |
| Spain: | Asturian Fishing Association of Oviedo |
| Germany: | Lachs-und Meerforellen-Sozietat |
| U.S.A: | Restoration of Atlantic Salmon in America Inc. |
| Canada and U.S.A: | Atlantic Salmon Federation |
| Ireland: | Federation of Irish Salmon & Sea Trout Anglers |

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# CHAIRMAN'S INTRODUCTION

There had been some hope that, following the improved grilse runs during 1998, there might be a further improvement this last season. Overall, however, and with few exceptions, it has been a disappointing year for most river systems. It now seems clear that the 1997 year class of smolts survived better at sea than those of the previous four years – hence the better grilse runs in 1998 and the improvement in the 2SW runs in 1999. However, the very poor 1999 grilse runs, with some running late, seem to indicate that the 1998 year class of smolts again suffered badly in the sea. In the result, the expectations of a continuing improvement in MSW numbers in 2000 are probably unlikely to be fulfilled. To date, there are no indications as to how well the 1999 year class of smolts will survive in their marine environment.

There is no escaping the fact that this is a depressing picture. It has of course been known for some time that poor sea survival of smolts is a crucial factor in the number of salmon returning to their natal rivers and underlines the Trust's long held view that more comprehensive research into marine survival needs to be undertaken urgently. Until we have a much clearer idea of precisely what is happening at sea, it is unlikely that the salmon will have any real prospect of surviving in substantial numbers in this new century. In the meantime, every effort must continue to be made to improve the conditions for the survival of the salmon and their progeny while they are in our river systems.

The Tripartite Working Group set up last year to examine the collapse of salmon and sea-trout stocks on the West Highland coast and to initiate remedial action has made useful progress over the last nine months. I had hoped to be able to report on the establishment of area management agreements between the fish farmers, District Salmon Fishery Boards and the West Coast Trusts at a local level but formal agreement, as is explained elsewhere in these pages, cannot be confirmed at the time of writing.

The report by the Review Group set up to examine Freshwater Fisheries in England and Wales, which was due to be with Ministers by Christmas, has also been delayed and is now unlikely to be in their hands before the end of January. This being the case, it is not thought likely to be made public before late February. As a consequence, until such time as the Group's conclusions and recommendations are known, both the Trust and the NASF(UK) have decided to delay forwarding their joint paper on interceptory netting to Government in Scotland, England and Wales.

One of the most worrying developments since the last Progress Report has been the detection of the ISA virus, but not the actual disease, in some brown trout and wild salmon parr. In view of the extremely serious implications of this discovery, the Trust in conjunction with the ASFB, the AWCFT, the S&TA and SANA made a joint démarche to the Scottish Executive seeking answers to a number of important questions and especially an assurance that there is no intention to down-list ISA or to abandon the current eradication policy. While no formal response has yet been received, it is encouraging that the eradication policy appears to be being maintained. The Trust nevertheless intends to keep a very close watch on this disturbing situation.

The following new members were elected to the Council at the Annual General Meeting in Fishmongers' Hall on 1st December:

Mr. John Lovett
The Hon. Sir Charles Morrison, DL

The following were also re-elected after a period of absence:

Lieutenant Colonel Robert Campbell
The Rt. Hon. Dr. Jack Cunningham, MP
Mr. Moc Morgan

I should particularly like to thank the following members who, having served for a period of six years, demitted office:

Mr. Gordon Bielby
Mr. Christopher Robinson
Mr. Andrew Wallace
Dr. Ken Whelan
Mrs. Margit Worsham

I am most grateful to all of them for the time they devoted and the contribution they made to the affairs of the Trust.

For some time now we have been looking at the Trust's publications to see whether they are any longer appropriate in their present form. In the result it was felt that some modernising was necessary and it has been decided to produce a much shorter half-yearly newsletter and a somewhat fuller annual report on the Trust's work. Both these publications will be produced in A4 format. While therefore this will be the last Progress Report in its present form, "Blue Books" on scientific and salmon management matters will continue to be produced in the present A5 format. The Trust will also be opening its own web-site early in the New Year.

Finally, after another busy year, I should like to thank our Director, Deputy Director, Treasurer and our secretary for all their hard and untiring work in attending to the Trust's many affairs over the last year. I am greatly indebted to them all.

H F O BEWSHER

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# DIRECTOR'S NOTES

Despite disappointments in 1999, one encouraging feature of the year has been the continued growth of co-operation and collaboration between the voluntary organisations concerned with angling, and especially with salmon fishing and salmon conservation. The Trust has taken its full part in this. Readers will know that the Trust associated itself with the committee which was established to develop co-ordinated submissions to the Salmon and Freshwater Fisheries Review Group on behalf of all bodies with angling interests. It was chaired by Lord Moran, who is, of course, one of our Vice-Presidents as well as being Chairman of the Salmon & Trout Association. Similar collaboration is evident north of the Border, where there is strong and constructive liaison between the Trust, the Association of Salmon Fishery Boards, the Association of West Coast Fishery Trusts, the Scottish Anglers' National Association, and the S&TA in Scotland. Chris Poupard, the Director of S&TA, has emphasised, in a recent message in Trout & Salmon, the need to build on all this common ground in order to develop and implement policies for the future, and the Trust strongly endorses this view.

One aspect of this in Scotland is the work of the "Angling for Change" group, whose Consensus Statement was reported in the June issue. Before taking this subject further, I have to apologise to the Grayling Society and to the Tweed Foundation. Both are active members of the group, and both were signatories to the Statement and the petition; I am sorry that their names were inadvertently omitted from the report. The Group is continuing its work – having set out the basic principles for overall freshwater fisheries management in Scotland, it is now engaged in the considerably more complex task of developing proposals for a management system that could implement these principles. Good progress is being made, but it is too early to enter into details here.

This growing co-operation and collaboration between United Kingdom organisations devoted to the well-being of wild salmon and sea trout is reflected abroad. In this issue, we publish two special reports on European salmon matters. One is a précis of a detailed survey of salmon in France in the 20th century, written by Jacques Tissier, whose wife Sylvie represents our French equivalent AIDSA (the Association Internationale de Défense du Saumon Atlantique) on our Council of Management. The other is a brief account of a conference in Spain on the problems facing the salmon of the Iberian Peninsula, where most of the principal speakers came from this country and Ireland. And, as always, we are reminded of the work of the North Atlantic Salmon Fund in rallying international support for the equitable ending of interceptory fishing for salmon, both on the high seas and in coastal waters.

As forecast in June, the report of the November 1998 workshop on "Problems Facing Salmon in the Sea" has now been published, and copies of the Proceedings may be obtained through this office at a 50% discount. The next workshop will be held in Edinburgh in April, and its subject will be Predation. The intention, having summarised current scientific assessments of the effects of predation (this will include the three year MAFF study whose conclusion the Deputy Director reports in this issue) is to examine the effectiveness and practicability of available or potential countermeasures and to identify a way ahead. Participation is by invitation; we have included representatives of animal and bird conservation organisations, in the interests of achieving a dispassionate and comprehensive approach to the problems, rather than provoking confrontation. An initial report will appear in the new June newsletter, which the Chairman has mentioned. As well as redesigning our publications, we have overhauled our database and removed a large number of out of-date addresses for the Progress Reports and Auction Catalogues. This will reduce printing and distribution costs.

However, we are always happy to send copies to new readers. Once again, we enclose in this Progress Report a Covenant Form and Banker's Order, together with an addressed envelope. The form has been redesigned to make it easier to complete; we hope that this will inspire readers to encourage others to join in providing the voluntary financial support that the Trust will always need.

The Chairman also referred to our website, which should be on line in February. For those with access to the Internet, the address will be <http://www.atlanticsalmontrust.org>. Little good does it do, however, to pride ourselves on being up to date – Dr Derek Mills shows us on page 23 of this Report that there is nothing new under the sun, by bringing to light a much earlier and less well-intentioned version of the method of tethering broodstock fish which our Vice-Chairman described in June

The show programme for the display caravan in 2000 is:

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| 6-7 May | Chatsworth Angling Fair |
| 17-18 June | Welsh Game Fair, Llandeilo |
| 1-2 July | Game Conservancy Scottish Fair, Scone |
| 28-30 July | CLA Game Fair, Blenheim |
| 4-5 August | Highland Field Sports Fair, Moy |

As always, we shall look forward to meeting supporters of the Trust at these events.

J B D READ

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## SALMONID 21C

A conference on the management of salmon and trout stocks in the UK and Ireland at the beginning of the new millenium will be held on 6th and 7th July 2000 at Newton Rigg College, Penrith, Cumbria. This conference is intended to bring together informed scientists and experienced fishery managers – the purpose is to examine how current scientific thinking can support managers in deciding on practical action to address the problems that are so widely recognised. The Atlantic Salmon Trust is one of a number of private and public organisations supporting this conference.

For further information, please contact:

Ian Gregg
SALMONID 21C
Brampton Grange
Penrith
Cumbria CA10 2QR

# THE WEST HIGHLAND INITIATIVE

The June 1999 Progress Report carried an announcement of the setting up of the Tripartite Working Group (TWG), representing Government, wild fishery interests, and salmon farmers, intended to address the collapse of sea trout and salmon stocks. The Terms of Reference of this Group were published on Page 8 of the Progress Report.

This Working Group has been chaired by the Fisheries Secretary of the Scottish Executive Rural Affairs Department (now Dr Paul Brady), and the Department has also chaired the three sub-groups which have addressed detailed aspects of work to promote measures for the restoration and maintenance of healthy stocks. The Trust has been represented in this Group by the Director, alongside Andrew Wallace for the Association of Salmon Fishery Boards, Mrs Jane Wright (President of SANA) for angling interests, and Dr James Butler (of the Wester Ross Fisheries Trust) for the Association of West Coast Trusts. For the salmon farmers, the Earl of Lindsay, Chairman of the Scottish Salmon Growers' Association (now Scottish Quality Salmon) has been supported by staff and consultants of the Association. Finally, the Scottish Environment Protection Agency (represented by Professor David Mackay) and Scottish Natural Heritage have also taken part in the work of the Group.

The Working Group has been distinguished by a welcome spirit of co-operation. It has developed practical proposals for establishing management agreements between fish farming companies and District Fishery Boards or Trusts at a local level. These agreements will cover a number of aspects, but one main aim will be that of reducing the levels of egg-bearing lice on farmed stocks to zero, especially immediately before and during the smolt run. This aim is to be achieved by synchronising production and fallowing cycles within an area, coupled when necessary with co-ordinated treatment as appropriate using new, more effective and environmentally acceptable medicines. It is hoped to have such agreements in place on a number of pilot river systems in time for this year's smolt run. Proposals have also been made for a viable means of extending fallowing periods and reducing the overall necessity for treatments. At the time of writing, the framework for these agreements has yet to receive full formal agreement, and therefore it cannot yet be reported in detail. An announcement should be made early in the New Year, and a comprehensive description will appear in the summer Newsletter which will follow this Progress Report.

The Group has also been working on a framework for assisting in the restoration of salmonid populations. This is intended to provide practical guidance and advice to District Boards on criteria and best practice, and to formalise arrangements for scientific support. John Webb, the Trust's Field and Research Biologist, will be associated with this work. Again, the framework is currently being finalised, and details will be available shortly. The aquaculture industry is expected to join in providing practical support.

This report is not as full as the Trust would have wished, but it indicates that we believe that real progress has been made, despite understandable doubts in some quarters. We look forward to being able to describe this progress in detail.

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# THE ASSOCIATION OF SALMON FISHERY BOARDS
# THE WAY AHEAD

(A report by the Director, ASFB)

In April of this year, at the AGM of the Association of Salmon Fishery Boards (ASFB), it was formally agreed that the roles of Salmon Fisheries Co-ordinator and Director of the Association would be amalgamated, due to the development of a considerable overlap between the two roles. This followed recommendations by the ASFB Review Group which was tasked with presenting ideas about how the ASFB should operate in the new political climate in Scotland with all the challenges facing salmon managers. Andrew Wallace, as the new Director of the Association, has taken on the responsibilities of the ASFB and was lucky to be able to recruit - from the former Scottish Office - Brian Davidson, who has many years of experience in salmon fisheries legislation and management matters.

The ASFB also took on premises in central Edinburgh and now has in place the makings of an effective and robust association which is outwards looking and engaged with many of the organisations with whom the ASFB will be doing business in future years. As well as inviting members on to the Council from the Scottish Anglers' National Association (SANA), Salmon and Trout Association, Salmon Net Fishing Association of Scotland, and the Fisheries Trusts, the ASFB now has an effective executive committee which will be the engine room of the organisation in future years.

The Association has attracted criticism in the past for being an organisation dominated by the larger East Coast rivers. The new executive and administration is committed to addressing this problem and will be devoting equal energy to the two fundamental problems facing salmonid stocks in Scotland today – the catastrophic declines of sea-trout, and in some places salmon, stocks on the West Coast and its corresponding effect on the local economy, and the long term problems associated with spring and multi-sea winter (MSW) fish.

Alongside the work of the Association, provision has also been made to continue the work of developing and supporting the Fisheries Trust network and the Association is already assisting in the formation of new Trusts in the Forth and Clyde catchments. The ASFB is also involved in the Scottish Fisheries Co-ordination Centre (SFCC), which is a partnership of 13 Fisheries Trusts and Boards with the Freshwater Fisheries Laboratory covering over half Scotland. The SFCC is responsible for standardising the collection of fisheries data throughout this network and provides a central facility for the collation, analysis and storage of fisheries data which will be of profound value in future years. A dedicated fisheries Geographical Information System (GIS) has also been developed to assist in the interpretation of data.

Finally, there are now the challenges and opportunities presented by the new Parliament, and the Association is already involved in a range of activities to ensure that it makes the best possible use of the much increased Parliamentary time that will now be available to address the issues of Scottish land and water resource management.

In order to do this it will be essential that the ASFB co-ordinates its activities with other fisheries NGO's and indeed, beyond that, with organisations who have less direct but often equally important mutual interest in the management of Scotland's rivers and salmonid resource. An informal but workable Salmonid Forum has been established between the ASFB, AST, the Scottish Anglers' National Association and the Salmon and Trout Association.

Wherever possible, efforts are being made to co-ordinate responses by the fisheries lobby to ensure a more unified voice.

The challenges for all fisheries management organisations are clear to all and many of them are daunting in their size and complexity. The ASFB and AST have always had a close working relationship, which is as strong as ever. But there are now clear signs that, at a more general level, fisheries users, owners and managers and their associated organisations are now able and willing to work together much more effectively, and as a consequence the prospects for making progress appear to be bright.

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## NORTH ATLANTIC SALMON FUND (UK)

(Andrew Whitehead – Secretary NASF(UK))

1999 has, in some respects, been a year of uncertainty, in so far as the purchase of Greenland and Faroes Salmon Fishing Quotas is concerned. There has been no clear indication as yet of firm agreements not to fish, with either country. However, in spite of these problems, there are some grounds for optimism. In Greenland, local enthusiasm for salmon fishing appears to be dwindling. The Quota is 20 tonnes, (for internal consumption), and NASF has funds in escrow to pay for it. In the Faroes, the situation is somewhat less certain, though there appears to have been little or no fishing there in 1999.

Because of the need to clarify the situation with Orri Vigfusson, the launch of the NASF(UK) Annual Appeal for 1999 was delayed until March. The Committee, notwithstanding the uncertain situation, accepted the obligation to contribute in 1999 towards the costs of Quota payments and the development and advocacy work in 1998. Moreover, there is little doubt that, in spite of the current problems in reaching satisfactory agreements, the much lower levels of commercial high seas fishing have been influenced by the continued pressure from Orri Vigfusson and NASF. Thus a much reduced target of £60,000 was agreed for the year, divided as follows:

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| Scotland | £50,000 |
| England, Wales and Northern Ireland | £10,000 |

The Committee has been greatly encouraged by the continued, widespread and generous support from River Boards, Angling and Fisheries Associations this year, as well as from a number of private donors. It is expected that the 2000 Appeal will set a further reduced target, given the funds already existing in escrow, and the prospects of relatively small costs to NASF for 1999.

NASF(UK) has joined with AST in the production of a paper on the interceptory exploitation of the wild Atlantic salmon. Written by Ian Gregg, the paper is painstakingly researched, covers considerable detail and is, unsurprisingly, somewhat controversial. It has been circulated for comment and consultation to a wide distribution, and will be submitted formally to Government to coincide with the completion of the report from the Salmon and Freshwater Fisheries Review Body. The Review Body is expected to finish its work early in the New Year. The paper has already received support from a number of organisations.

# AST FIELD AND RESEARCH BIOLOGIST'S REPORT

(John Webb)

## DNA Fingerprinting studies

### Lifetime fitness among spring salmon and early running grilse

This autumn, a total of 55 spring salmon and early running grilse have been captured in the adult trap situated near the mouth of the study burn. This group included 20 two sea winter (2SW) spring running female salmon and 2 early running female grilse (1SW). The remainder were a mixture of 1SW, 2SW and 3SW males. All the adults that have returned to the burn this year have been sampled for scales, microtags and tissue for DNA testing. Analysis of the various samples taken at capture will be used to identify which of the fish are derived from the experimental groups of smolts and autumn parr that have been sampled, tagged and released over the past four years.

The numbers of females that returned to spawn this autumn are a significant improvement on last year's total (nine females). However, this total still corresponds to less than 60% of the number of females required to stock the burn fully under natural conditions.

Monitoring of the juvenile salmon population, established via a rolling programme of experimental stocking in the experimental burn since 1994, is continuing. This year's autumn parr sampling began in early September with the arrival of the first downstream migrants to the trap. To date, more than 200 autumn parr have been trapped, sampled, tagged and released. Sampling will continue until the end of the autumn run in December.

### The family structure of the smolt and autumn parr migrations leaving an upland spawning stream.

DNA is being extracted from more than two thousand five hundred adipose fins removed from smolts and autumn parr that have left the study burn since the autumn of 1996. The DNA will then be subjected to an analysis using the latest DNA methods developed at Stirling University, the University of Aberdeen and FRS Marine Laboratory in Aberdeen. These methods will generate information on the maternal and paternal origin of each fish and its redd source within the burn.

The first data output will be from 200 smolts captured in a 24hr period in the spring of 1997. The samples are currently being analysed in the Marine Laboratory in Aberdeen, and the results of this preliminary analysis are awaited with great interest. This first stage will then be followed by the much larger genetic screening programme of the remaining sample groups which will be completed by the early summer of next year.

## Spawning studies

### The relationship between discharge and the distribution of spawning activity of spring salmon and early running grilse in an upland stream.

During the late 1980s, I undertook a series of detailed field studies on the spawning behaviour of adult salmon in the Girnock burn. The period of observation spanned the three consecutive

spawning seasons from 1986 to 1998. One output of this work was the production of a large data-set that describes the relationship between the distribution of spawning activity and flow.

In a collaborative study between the AST, FRS and the Geography Department of the University of Aberdeen we are investigating the relationship between discharge and the timing and distribution of spawning on a whole spawning stream system. To date, the study has concentrated on determining what effect discharge has on the distribution of spawning: an important factor affecting the efficiency of the processes of dispersal and colonisation by the young fish from natural spawning - within the limits of the availability of suitable rearing habitats.

Our analysis shows that some areas of the burn are used by spawning female salmon over a greater range of flows than others. However, the threshold varies from one area of the burn to another. Moreover, fish spawning in the upper part of the burn appear to require a greater minimum level of flow (expressed per unit area of the channel or indexed to the median flow at each site) than those using sites further downstream.

These early results have important implications for our understanding of how natural flow regimes affect the distribution of spawning activity of salmon in runoff-fed upland rivers. In particular, it shows that changes in discharge (via abstraction, drainage etc.) are likely to have a greater impact in the upper sections of spawning streams than areas further downstream.

Research is now focusing on attempting to run simulations of the effects of water abstractions, climate variability and land-use change on the timing and distribution of female salmon spawning activity in the Girnock system. The main aim of the simulations will be to attempt to evaluate how important the level and location of any water abstraction point or land use change is likely to be in determining the availability of suitable spawning discharges in different areas of the Girnock system.

**Meetings and Publications**

In late June I attended an International Conference on fish telemetry at the University of East Anglia in Norwich. A brief account of some of the presentations made at the meeting appears later in this Progress Report.

On the 18th November I gave the annual IFM (Scotland) lecture at the University of Aberdeen. My presentation focused on the problems currently facing spring salmon and their fisheries and the options that are available to managers to improve returns.

A paper entitled 'Spatial patterns of discharge utilisation by spawning female Atlantic salmon (*Salmo salar* L.) in an upland stream: implications for flow allocation' will be submitted shortly for publication.

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# PISCIVOROUS BIRDS RESEARCH

(Report by the Deputy Director)

The results of the long awaited fish eating bird research programme, jointly funded by MAFF, DETR and the EA, were made public during the 4th Seminar on Piscivorous Bird Research held on 30th September. The Trust's Deputy Director was amongst the 30 or so attendees who had been invited to attend the launch. The overall study aim had been to *investigate the problems of fish eating birds at inland fisheries in England and Wales* and was split into five discrete subject issues:

**Assessment of the Problem:** Conducted by The Centre for Environment Fisheries & Acquaculture Science (CEFAS) at a cost of £K32.

**Population, Distribution, Movements and Survival:** Carried out by The British Trust for Ornithology for £K102.

**Feeding Behaviour:** A joint study by The Wildfowl & Wetlands Trust (WWT), Institute of Freshwater Ecology (IFE) and the Institute of Terrestrial Ecology (ITE) for £K210.

**Case Studies:** These were carried out by Liverpool John Moores University at a cost of £K335.

**An Assessment of the Effectiveness of Management Measures to Control Damage:** Another joint study by The Central Science Laboratory, British Trust for Ornithology, CEFAS, and The Applied Ornithology Unit Glasgow University for £K332.

I have specifically listed the contracting organisations to indicate the widespread academic base used for the research programme. As a matter of interest the total cost, less MAFF/DETR/EA internal expenses, came to £1,011,000, which is, of course not much less than the reduction in Grant in Aid being imposed by MAFF on the EA in financial year 2001 – 2002. The first report, an assessment of the problem, was published at the start of the programme and has been complemented by four additional volumes, weighing in total 5.2 Kilos.

**Assessment of the Problem:** The objective was to identify the extent and significance of the impact of Cormorants and Sawbills on inland fisheries in England and Wales with due regard for the economic value of the fisheries and conservation of the bird species. Birds under study were Cormorants, Goosanders and Red-Breasted Mergansers. Cormorants were confirmed as being versatile hunters in terms of foraging methods, habitats exploited and the numbers of fish species taken (19 were recorded). Although goosanders could take a range of freshwater fish, those located on upland waters depended largely on salmonid fry, parr and smolts. Red-breasted mergansers were considered to be relatively scarce and not perceived to be a problem in England and Wales.

**Population, Distribution, Movements and Survival:** The objectives of this study were to establish the present population size, trends, distribution and seasonal movements of fish eating birds and survival rates for cormorants. Figures presented both at the seminar and in the written reports were confusing and difficult to reconcile. This led to considerable debate during question time. As far as I could establish, cormorants split into two categories: those breeding inland, which were estimated to be 1,473 pairs in 1998 compared with 9 pairs in 1981, and a wintering population of 15-16,000 single birds. Goosanders were estimated as being around 2,700 breeding pairs in 1987 with a percentage increase of 163% in Wales and 21% in England during the following 10 years to 1997. Some of the statistics offered were extremely dated. For

example it was reported that the wintering population of goosanders as at 1991 ranged between 3,300 and 8,900 birds, depending on methodology used, with a 3-11% increase annually. An estimated 800 pairs of mergansers bred in Britain in 1987 with wintering populations of 9,500 birds. The annual increase was estimated at 2-6%. All these figures have to be treated with caution in view of the confusion in presentation.

**Feeding Behaviour:** The aims of this element of the research programme were to review the feeding behaviour of grey herons and their impact on fisheries, the characteristics of sites preferred by cormorants, the behaviour of cormorants and goosanders, and finally the daily and seasonal movements of cormorants. Herons preferred caged stocks to those in open ponds, concentrated on small fish and could take up to 6% of stock. As such they were not considered to be the cause of serious damage. Cormorant sites reviewed were limited to 80 on enclosed waters and did not seem to reflect a true pan-country analysis. Roosts could be up to 26km from feeding areas. Feeding peaked in the early hours. (The Wye was included in this element of the study). The average intake of fish in the summer was 303 grams rising to 401 grams in the winter. Movements of cormorants included daily flights of up to 82Km.

**Case Studies:** A number of case studies were commissioned in order to quantify the impact of cormorants and goosanders on inland fisheries. Assessments were conducted on both still waters and rivers. The conclusions indicated that cormorants could take up to 50% of fish stocks in still waters and 14-30% in rivers. The diet of goosanders on the Wye included 16-97% juvenile salmon whilst this reduced to 7-14% on the Ribble and Hodder. However, the figures were variable and tended to be location specific rather than general. At some sites predation could lead to a decline in fisheries whilst at other locations there was not a significant problem.

**An Assessment of the Effectiveness of Management Measures to Control Damage:** The objective of this study was to investigate how damage to river and still water fisheries could be managed by using techniques which were humane, cost effective and acceptable in terms of environmental impact. These included:

Shooting to Kill and with Blanks: The results did not show a significant difference between the effects of lethal and non-lethal shooting. What the study did not say was that dead cormorants stopped feeding whilst those scared off merely moved on and continued with their feeding patterns elsewhere.

Stocking Control: This was the well-publicised technique of netting one still water and using an un-netted one as a control. After 6 weeks a 62% mortality was observed in the open lagoon compared with 4% in the netted water.

Fish Refuges: No reduction in predation was recorded.

Laser Light: It was very clear to me that the presenters did not understand lasers or what effect they would have on birds. When asked how they scared birds there was a deafening silence. No conclusive results were produced when using this extremely expensive method of control.

Habitat Management: Wires draped over open waters were found to reduce cormorant predation. However researchers failed to appreciate that they would have a similar effect on those trying to fish.

Conditioned Taste Aversion: CTA techniques using trout with captive cormorants proved to be successful and to last for up to 7 months. There was no indication as to how these techniques could be used with wild birds.

Human Disturbance: Whilst these were deemed to be effective in situ, birds warned off protected waters merely re-located to other feeding areas. Additionally, an attendee at the seminar pointed out that birds having to cover additional distances to feed significantly increased their food intake requirements.

It would be very easy to dismiss the research programme as being a waste of £M1+ and that the old saying that "a dead cormorant does not eat fish whilst a live one does" still had relevance. However this would be ignoring two important conclusions given in a joint press release by the Environment Minister, (Chris Mullen), the Countryside Minister, (Elliot Morley) and the Secretary for Agriculture and Rural Development for the National Assembly for Wales, (Christine Gwyther) which stated:

> That the results *confirm that serious damage to fisheries is a problem* (albeit the statement went on to say *for specific fisheries rather than a general problem*). The Government would like to *consider the views of fishing and bird conservation interests before taking final decisions.*

Clearly MAFF has recognised the need to open the debate on the findings and is now seeking to widen its consultation with interested bodies. It is the intention to hold what is described as being a *single meeting* with interested parties representing angling organisations, fishery managers, research institutions and a wide range of Non Government Organisations including the RSPB, the Salmon & Trout Association and, of course, the Atlantic Salmon Trust. It will be interesting to see how any conclusions and recommendations are to be developed and whether or not they will represent in a balanced and true fashion the interests of those organisations being brought into the consultative process. These will, of course, be examined during the Trust's seminar addressing predation, which is to be conducted in Edinburgh next April.

NB. This assessment of the research programme is a personal one by the author and may not always conform with the findings published in the official reports.

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## SALMON IN FRANCE AT THE END OF THE 20TH CENTURY

(Jaques Tissier – A.I.D.S.A)

In the last century, there were numerous salmon rivers in France, but now there are only 41. In three major catchments, rehabilitation has been initiated, starting from a zero residual stock level. In 1987 there were 5800 salmon fishermen, of whom only 2000 remained active after 1994. Perhaps only one in a thousand French fishermen now fishes for salmon.

In 1997 1430 catches were recorded, of which 125 were taken by commercial fishermen, which represents less than 50% of the average for the previous ten years. This figure should be increased by 644 fish caught in the Adour estuary, totalling 2074 salmon caught in 1997. In the last eleven years, only 1988 and 1994 were good in respect of rod catches.

The 1994 average catch per angler of 2.3 fish fell to 0.43 in 1997. In that year 46% of salmon anglers were unsuccessful, and on average it took 136 hours of fishing to catch a salmon. Scale readings did not reveal any fish that had been S3 smolts, and in the South West, 73% of smolts had only spent one year in the river. Brittany showed the highest proportion of grilse, while the South West recorded the highest proportion of three sea winter salmon at 11% of fish caught. In 1997 the stock enhancement introductions involved a total of 3,055,984 hatchery reared juvenile fish.

**The rivers of the South West**

The Nivelle, the most southerly, enters the sea at St Jean-de-Luz, and the Nive, with the Adour, at Bayonne. The Gave d'Oloron, formed by the joining of a number of mountain streams descending from the Pyrénées, only really exists below Oloron Sainte-Marie; its rain-fed regime produces high water levels in spring. On the Gave, declared rod catches which stood at an annual average of 1,883 fish for the last eleven years have fallen to 134 in 1997 and only 93 in 1998. The Gave particularly needs multi sea winter salmon, for this catchment used to be known for its big fish. It is a powerful river, comparable to the Tay, which wades easily – a rare characteristic among French rivers.

The commercial net fishery in the lower Adour is the most significant in all French catchments. However, A.I.D.S.A has opened up a solution in buying out the commercial fishing rights, and in the spring of 1999 a three year agreement was reached for the closure of all nets between 7 June and 21 July. This solution brings a breath of oxygen since the net catches represent 83% of the total.

**The rehabilitation of the Dordogne and Garonne**

In the case of both these rivers, which flow into the sea by way of the Gironde, this meant starting from a zero residual stock. The salmon in these two rivers used to be big fish, without doubt comparable to Loire salmon – there has been a report of a 48 pound fish taken on the Garonne.

> The Dordogne. The construction of the Tuilières dam in 1906 sounded the knell for Dordogne salmon, but in 1985 a pool and traverse pass was installed at the Bergerac dam, followed by a fish-lift at Tuilières, 134 miles from the sea, and a further pass at Mouzac, which opened up over 180 miles of river as far as the impassable dam at Argentat. Restocking was undertaken with wild stock from the Allier. Returning runs have been slow to develop, but the highest, in 1997, has been 571 salmon.
>
> The Garonne. As early as 1864 the Bazacle dam totally prevented the passage of salmon. A lift at Golvech, a pass at Ramier in 1987 and another at Bazacle in 1989 have freed the river anew, and salmon can now run way upstream to above Toulouse. No salmon appeared at Bazacle in 1990, and the greatest number recorded has been 61 fish in 1996.

Understandably, rod fishing for salmon is not permitted on either of these two rivers. The fish that has benefited above all from these improvements is the shad – 87,100 were counted at Tuilières in 1996.

**The Loire-Allier catchment**

The Allier stock is threatened with extinction. These are three sea winter spring fish, able to cover more than 600 miles to reach their spawning areas. Fishing has been totally suspended since 1994, but the benefit is slow to appear, since spring fish have suffered particularly from poor sea survival. And the obstacles begin with the "mud plug" in the estuary, followed by the barrage-bridge at Vichy (which is now equipped with two passes), the Bajasse dam at Brioude which has a new pass, and the hydro-dam at Langeac which is passable by spawners but is very dangerous for descending smolts. Finally, the dam at Poutès-Monistrol was equipped in 1986 with a fish-lift, but the number of fish passing has varied from 3 in 1991 to 109 in 1988; in 1997 37 were counted, although 389 had previously passed Vichy. In the twelve years between 1986 and 1997, only 343 salmon have reached the river upstream of Poutès.

The tributaries of the Allier are equally subject to problems: on the Sioule 28 out of 30 proposed improvements have now been undertaken, and on the Dore a baffle pass has been installed at the Gour de Champy dam, but on the Allagnon the private dam at Grand Pont, although it has been out of service for more than ten years, has still not been demolished.

The improvement of the Allier will clearly take many years more, and anglers will be deprived of their sport for a long time unless the large hatchery which is to be built at Chanteuges has a major effect on the re-establishment of stocks.

**The rivers of Brittany**

There are no less than 21 salmon rivers in Brittany, of which 11 flow to the North coast and 10 to the South. These are small rivers, very different from those described above. However, in 1997 the Department of Finistère led French Departments with 723 catches, which was 55% of the total. This contrasts with 1994, when its reported catch of 2311 represented 59%, and the River Aulne had a record total of 1040 salmon. The 1997 catch figures were the lowest recorded since 1979.

Breton rivers suffer from a serious pollution problem resulting from intensive farming, of poultry and above all of pigs, and the Fishery Associations are giving high priority to the resolution of this question.

Stock exploitation is controlled by the TAC (Total Authorised Catch) system. This management method aims to allow an end of season spawning escapement sufficient to ensure the maintenance of stocks at an optimum level. In years when runs are good, catchment TACs may be increased; if this is not the case, there is a reduction in the numbers permitted to be taken.

Unhappily, spring salmon still figure significantly in the catches – 44% on average – whereas they represent a very small proportion of the stocks, and in spite of the extension of the season until the end of October on some rivers to increase the grilse catch.

### The salmon rivers of Normandy

16 Norman rivers are run by salmon, but the main stocks are of sea trout. Salmon fishing is only permitted on three rivers of the Cotentin – the Sienne, the Sélune and the Sée – and on the Bresle, in the north. The Vire and the Orne are under restoration, which in the case of the Bresle began thirty years ago.

The rivers Sienne and Sélune, flowing into the Bay of Mont Saint-Michel, used to be celebrated for the size of their salmon. For many years the Sée held the French catch record. The Sélune is a very short river, only about twelve miles long, because of the Roche qui Boit dam. In the last century, the Bay supported fisheries employing both gill nets and hand-operated tackle similar to shrimping nets. Currently, this is only practised by poachers, but protection zones have recently been established.

### The rivers of Artois and Picardy

The Canche and the Authie are two rivers of the Nord-Pas-de-Calais region which still held good populations in the 19th century, and which are now only at a residual level because of numerous small dams and weirs – 62 on the Canche and 31 on the Authie. A major improvement programme has yet to be undertaken. Before these obstacles were put in place, the original stocks could have been as many as 4000 and 1500 adults respectively.

### The return of salmon to the Rhine

The last Rhine Atlantic salmon disappeared in the 1950s, but the riparian States have set up an international commission for the protection of the Rhine, aimed at the ecological restoration of the river and the intensification of anti-pollution measures. To achieve the return of salmon, the SALMON 2000 programme was launched in 1987, aiming to restore continuity to the sections isolated by dams. At the same time, restocking with juveniles was undertaken in tributaries with adequate water quality and potential spawning habitat.

The first positive evidence of returning salmon has been confirmed in Holland, Germany and France. The first natural spawning was observed in the catchment of the River Seig (North Westphalia) in 1993, and in the River Ill (Alsace). The construction of a fish pass at Iffezheim, downstream of Strasbourg, which was due to complete in 1999, will allow access as far as the Ill catchment. In the meantime, electrofished broodstock have been transported to the Ill and to the Bruche, its main tributary. In 1995 9 adult fish caught below Iffezheim measured between 25 and 30 inches. In 1996, 22 salmon and 63 sea trout were caught at the same location.

The predominance of grilse is explained by the use of one sea winter broodstock. However, the use of Broodstock from the Nive should result in an increased proportion of multi sea winter salmon.

### And the Seine?

The project to restore salmon to the Seine is at least as ambitious as that of returning them to the Thames.

At one time Atlantic salmon, and also sturgeon, ran as far up as the Champagne and Burgundy regions. The "MIGR'EN SEINE" project has a target of 2015 for the return of salmon to the Cure, a tributary of the Yonne. Fish passes are under construction or on the point of being built on the Seine at Andresy, Chatou and Suresne, downstream of Paris.

# SALMON IN THE IBERIAN PENINSULA

(Oviedo, November 1999 – a report by the Director)

The Iberian Peninsula marks the southern end of the range of the Atlantic salmon in Europe, and as global conditions change, the status of stocks becomes particularly important. Both Spain and Portugal had strong salmon populations until the end of the nineteenth century. Now, salmon are nearly extinct in Portugal, but a restoration programme is under study. Many Spanish rivers have been lost to salmon, and in others stocks are at a dangerously low level. Salmon management is largely the individual responsibility of the northern regions: Asturias, Galicia, Cantabria, the Basque Country, Guipuzcoa and Navarre, and there has been little central direction, although there has been a nationally imposed ban on netting since 1942. Despite nominal representation in the North Atlantic Salmon Conservation Organisation (NASCO) through the European Commission, no Spanish or Portuguese delegates have attended meetings in recent years.

In 1980, the recorded rod catch for all Spain was more than 8000 salmon. In 1999, only 1232 fish were taken, of which 90% were caught in the Principality of Asturias. The conference took place in Oviedo, capital of the Principality, and was jointly organised by the Institute of Natural Resources of the University of Oviedo and the Royal Asturian River Fishing Association. It brought together participants from all the Spanish salmon regions and from abroad to discuss "The Challenge of the 21st Century", and it was the first time that such a gathering had been held in Spain. As will be seen, it is planned that there should be further such meetings on a regular basis.

The problems facing salmon stocks in Spain are the familiar ones around the North Atlantic, but the special character of the northern Spanish rivers introduce local factors. They rise in the steep Cordillera and often meet the sea through long estuaries with distinct flood plains. Many suffer from obstacles to migration, most of which are hydro-power dams of various sizes, and fish passes, where they exist, are of variable effectiveness. Pollution is a problem in a number of rivers, although substantial work to improve water quality is in hand. Angling pressure is a significant factor, and although there is a requirement to tag all fish caught, there is no control on the exploitation of spring fish, despite the perilous situation of the stocks.

There were over 100 participants in the three day conference, which came at the end of a week of exhibitions and local publicity, including a fly-tying competition, with strong support from the municipality of Oviedo. They represented regional governments, academic institutions, industry and, in large measure, angling associations and individual fishermen. In addition to the formal presentations, a number of papers which had been submitted were distributed in a bound volume at the beginning of the conference. They were summarised during the sessions, and their authors took part in the discussions. Papers were published in their language of origin and were therefore mainly in Spanish, but simultaneous translation in English and French was available throughout the conference.

The keynote speech at the beginning of proceedings was given by Dr Malcolm Windsor, Secretary General of NASCO. He described the present situation as a crisis. He called for: the establishment of a new Atlantic Salmon Council to co-ordinate within Spain and to provide a Spanish voice to the EU, and through the EU to the international salmon world in NASCO; stronger efforts to protect habitat, particularly from hydro-electric development; increased support for scientific research; management of the stocks in accordance with the Precautionary

Approach; and enhanced public relations activity to gain political and public support for salmon conservation issues in Spain.

Orri Vigfusson introduced the first main session, which followed; he recounted the problems of interceptory netting and the work of the North Atlantic Salmon Fund, and I was then invited to speak on "International aspects of salmon management". After emphasising the need for an international approach, and discussing the benefits and shortcomings of NASCO, together with the role and contribution of non-Government organisations (NGOs), I described the development of the International Atlantic Salmon Accord (published in the June 1998 Progress Report), and outlined its recommendations. These have obvious relevance to the Iberian situation, where stocks are in such a precarious condition.

The second session was devoted to an examination of the current state of Spanish and Portuguese stocks. The principal speaker was Dr Juan Antonio Martín Ventura, who heads the Environmental Impact Evaluation and Rehabilitation Service of the Principality of Asturias. He has long advocated Spanish involvement in international salmon management, and is a member of the Council of Management of our French equivalent AIDSA (Association Internationale de Défense du Saumon Atlantique). His very comprehensive presentation summarised current knowledge of stock levels and juvenile production, and outlined the programmes envisaged to improve the situation. This was supported by a number of detailed papers covering general and regional aspects, with particular regard to habitat and fish access.

The third session dealt with research, and the main speaker was Dr Ken Whelan, who now heads the Salmon Management Services Division of the Marine Institute in Ireland. He is of course well known to the Trust; until recently he has been a member of our Council of Management, and he remains a valued participant in the Honorary Scientific Advisory Panel. He outlined the scope of the practical research that he saw as needed to further salmon management, with a strong emphasis on increasing knowledge of the effects of habitat and the environment. He also discussed the effects of aquaculture – which is already proving a problem in Spain. The potential impacts, including the possible spread of gyrodactylus to the wild, were well appreciated by the audience. The supporting papers in this session were particularly detailed, and included work on water quality, fish health, genetic aspects, and the impact of hydropower installations and the effectiveness of fish passes. A point that became clear was that different regions were often working to different standards in survey and analysis of conditions. I was able to draw attention to the work of the Scottish Fisheries Co-ordination Centre in overcoming a similar problem, and I have provided details of its work and protocols to the organisers of the conference.

The final session covered salmon management and the involvement both of public bodies and NGOs. The main speaker was Martin O'Grady, of the Irish Central Fisheries Board, who gave a well illustrated description of the techniques of bankside and in-river habitat restoration which he has been deploying with such success. He was followed by Jaques Chouffot, deputising for Jean Servat, Président of AIDSA, who summarised the situation around the North Atlantic. A large number of supporting papers dealt with a variety of subjects, ranging from rehabilitation projects for individual regions and particular rivers, to the development of a national inventory of obstructions to migration.

Discussion was lively throughout the conference, and particularly in the closing stages. The vice chairman of the Royal Asturian River Fishing Association made an eloquent case for anglers to play their full part in conservation, including the exercise of restraint, such as by the practice of catch and release. This approach was welcomed by much of the audience. A number of formal conclusions were developed and announced. These may be summarised as:

- The need to continue to gather information
- The need to establish common research and management criteria throughout the area
- The need to apply the precautionary approach to salmon management
- The need to continue to reduce interceptory fishing, and to bring down angling pressure
- The importance, in the management of rehabilitation, of ensuring juvenile survival in new rearing areas
- The care that must be taken in any movement of live fish stocks to avoid the spread of disease and to minimise genetic consequences
- The need to be prepared for problems arising from any growth in aquaculture
- The importance of the involvement of the regional and national Administrations in the international salmon management, especially in respect of problems during the marine phase of the salmon's life cycle
- The need for active habitat protection
- The need for education on the importance of the wild salmon, including its contribution to local economies
- The need for studies of the special genetic character of salmon in the Iberian Peninsula
- The need for public works to take full account of potential harmful effects on stocks

The conference concluded with the welcome announcement of the formation of a National Salmon Committee to provide a permanent inter-regional forum for debate, analysis and study of salmon matters. The need for such a body, which up to now had not existed, was formally recognised; it would contribute to the formation of Spanish policy in international salmon management, and must involve all local movements.

Effective as it was, the conference was not all talk. During the meeting, delegates attended the opening of a new, expensive and most impressive fish pass at a 14m dam on the river Nalón, near Oviedo. The upstream pass comprises 29 chambers, of which the upper 20 have a difference in level of only 30cm between each chamber. An adjustable glide can be brought into operation to facilitate smolt migration. This is one of 10 passes that have so far been built on the river, out of a planned total of 28. The aim, by the year 2002, is to increase the length of river accessible to salmon from 55 to 263 km.

On the day after the conference, delegates were able to travel to the eastern border of Asturias to visit fish traps on two famous rivers, the Carés and the Sella. Both were situated in spectacular scenery, and the clear bluish green water was high after a recent snowfall on the Picos de Europa. Encouragingly, there were a fair number of good looking fish in the traps. We came away impressed with the recognition of the need for action to preserve a very special stock of salmon at the limit of its range, a stock which is particularly vulnerable to the potential effects of climate change.

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# A CONFERENCE ON FISH TELEMETRY IN EUROPE UEA, NORWICH. 20 – 25th JUNE

(John Webb, AST Biologist)

In late June, delegates from all over Europe, Japan, USA, Canada gathered at the University of East Anglia in Norwich for a five-day conference on fish telemetry. The meeting was divided into four main theme sessions, with presentations and poster displays covering a large number of different studies on a wide range of different species of freshwater and saltwater fish.

The first session of the meeting covered the topic of fish telemetry methods and the new technology that is being used to monitor fish behaviour. The past few years have seen many improvements in the design and operation of many key components of transmitting tags. As a result, many tracking systems are now smaller and more reliable than ever before. Further more, the development of various specialised tags allows researchers to monitor changes in a wide range of environmental variables, including water pressure, heart beat, ambient light levels and temperature. The use of satellites is also now becoming commonplace – particularly in studies using long-life/long range archival tags that are being attached to many species of marine mammals and large ocean going fish like tuna, marlin and sharks.

Several papers dealt with the development of tags and associated monitoring systems that could be used to follow fish over large distances in large freshwater lakes or in the open ocean. Rather than attempting to follow each fish directly, researchers are increasingly turning to archival type tags that measure the angle of the sun at key times of the day, together with other variables such as water temperature and depth. Upon recapture or relocation, these so called 'geopositioning' tags can be down-loaded directly or interrogated remotely using the latest mobile phone/satellite technology. The movement of the tag (and its host) during the monitoring period can then be estimated by calculating a series of longitude and latitude coordinates from the stored information. Sadly, these complicated tags are still quite bulky and can only be used on large fish. It will probably be some time before such a system is small enough to be attached to smolts leaving UK rivers.

An increasing number of behavioural studies are relying on the use of PIT or 'passive integrative transponder' tag systems to monitor fish behaviour. These small tags are about the size of a large grain of rice and can be implanted in fish with ease and at relatively low cost. The tags carry no form of a signal generator themselves but can be 'called up' by being energised by a suitable system of transponder receivers that detect and identify each tag as it passes by a detector array. The system is similar to that which is currently being used to tag domestic pets for identification purposes. PIT tags are particularly useful in laboratory and field studies on the social and feeding behaviour of smaller fish and monitoring the movement of large numbers of fish at selected locations within watercourses, such as fish passes and obstructions.

The 'migration and behaviour' session saw presentations on a wide range of studies involving species varying from salmon to red snappers. One paper described the results of recent research on the River Tana in northern Scandinavia. The study focused on the behaviour of large MSW salmon entering the river. Salmon returning to the Tana were observed to move quickly upstream from the estuary to 'resting' positions within the mainstem. These stopping points are

often quite close to the fish's final spawning position. This behaviour differs from many patterns of adult salmon migration recorded in UK rivers, where upstream movements are more usually in a stepwise manner, often over a period of months or weeks. It is only among the later running fish entering rivers like the Dee, Tay and Spey in the autumn months that we see fish moving straight upstream to locations near their final spawning positions. The reasons for these differences in behaviour are not known. However, it may reflect the sheer size and flow regime of the River Tana and the fact that the river has no natural barriers to movement within the mainstem.

Increasingly, fishery managers are using tracking techniques to monitor the effectiveness of their management programmes. The habitat utilisation and ecology session saw a range of papers on the application of both acoustic and radio tagging methods to investigate a diverse range of ecological and management related questions.

In an attempt to save a run of salmon in the River Laerdalselva in southwest Norway, threatened by the arrival of the deadly parasite Gyrodactylus salaris, researchers have been using radio tracking to assess the effectiveness of a novel method to secure the future of the Laerdals's stocks. Following the discovery of the parasite in 1996, adults that entered the river in that year were captured by a programme of intensive netting and angling. The fish were transported back downstream to a seawater site in the fjord near the mouth of the river where they were kept in net pens. The river was then poisoned with rotenone in an attempt to clear the system of all fish hosts of the parasite. After the treatment had been completed, the adult fish were removed from the pens, fitted with radiotags and released back into the river. Subsequent monitoring showed that all of the fish that were released remained in the river over the spawning period.

In another study, fifty hatchery reared trout stocked into a Danish river to enhance angling returns were tagged with miniature radio-transmitters. The fish were tracked every day for the first week after release and after that every second day. After five weeks, only 13 of the tagged trout remained in the river. Interestingly, analysis of the data suggests that the surviving fish had a lower level of activity each day than those lost. Many of the 'lost' tags were subsequently found in faeces and carcases located on or near the river's banks. This led the researchers to conclude that most of the losses had been caused by predation by otters and various avian predators.

In a similar study undertaken in Denmark, miniature radiotags were used to study rates of predation by cormorants and herons on wild and reared trout entering a fjord in the eastern Baltic. During a four week study in April-May 1997, researchers monitored the emigration of tagged fish from a small stream into an estuary and the head of the fjord. Tag signal monitoring at a nearby seabird colony showed that at least 65% of the tagged fish lost had been predated by cormorants, with many smolts having been taken in less than 48hrs after leaving the river.

Over the course of the conference, it was clear that considerable developments have been made in the electronic circuitry, monitoring capacity and reliability of the latest tracking systems. However, it was very noticeable that comparatively little attention appears to have been focused on improving the design of tags themselves. In many cases, the casing design of tags and their methods of attachment or implantation appeared to have changed little from some of the early experimental systems that were developed ten or fifteen years ago. Indeed, a number of speakers reported research findings that may have been effected by a combination of rather poor tag design and unsympathetic methods of attachment to the fish being studied. On reflection, it

would have been very interesting to have heard the views of some of the aerodynamic specialists from the nearby Lotus sports car factory on the basic problems of minimising the weight and drag effects of tags, and the best ways of attaching them to streamlined animals like fish.

Further details of the results of these studies and others presented at the conference will be available in the published proceedings.

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## TETHERING SALMON – A POACHER'S TRICK

(Derek Mills, Tweed Foundation)

I was interested in John Hopkinson's description in the June 1999 Progress Report (pp26,27) of the practice of tethering salmon in the river – necessity being the mother of invention – until they could be transferred to a hatchery as part of a stocking programme on the Wye.

The method he uses is an only slightly refined method used in the past by Tweed poachers to conceal in the river salmon they had caught illegally until such time as it was safe to retrieve and dispose of them. The method is beautifully described by W. Sorley Brown in his book 'The Ne'er-Do-Weel' published in Galashiels by A. Walker & Son at the turn of the century (pp.214-218).

> '... Two anglers suddenly appeared at the edge of the pool ... One of the men got into a pair of waders, and wading almost waist-deep in the pool, commenced to spin. A great many kelts were splashing about in the water, and I judged that he was on salmon fishing bent, as the method by which he spun the bait suggested such a proceeding. He hooked a fish which showed a good fight. After several minutes' play I saw it drawn to the side of the pool, where it was lifted out by the man on the bank. I expected the fish to be killed and put in the basket, but I soon saw that the men had a much safer plan in store – that is to say, they knew that the kelt that they had caught would in all likelihood be detected by watchers if put into the basket, and that it would be a most unwise policy to kill and hide the fish somewhere. After looking about him in suspicion, the man who had lifted the fish from the water took a long piece of strong cord from one of his pockets, and tied one end very firmly round a large stone. The other end was tied round one of the salmon's gills. This accomplished, he with the waders carried stone and fish several yards into the pool and let them down there. He then went back for his rod and recommenced fishing.'
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> 'I had gone a good distance up the river since the forenoon, and was returning home by way of the pool alluded to late in the afternoon. The two men were both there, but they were sitting on the bank, while a gentleman, attended by his fisherman, was wading in the pool from which I had seen the kelt caught.'
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> 'I sat down beside the men, who of course were "trout fishers" angling with blood-thirsty looking spinners for salmon, or rather kelts.'

'"Oo've seven beasts tied up in there," said one of the men in response to my inquiry, "Ye see," he continued, "oo canna get them away for them fishin'. They're just wadin' in among oor fish, tae, and A' doot it'll be best if Oo' clear oot." "Dinna be sae daft; they'll be sick o' the business in a wee while, Bill" replied the other man.

'This proved to be the case, as both gentleman and fisherman came out of the pool shortly afterwards, and went away down the river ... Then I saw the kelts taken out of the water in which they had been hidden. They would run from 7lbs to 14lbs in weight. But the large basket which the men had with them would only hold five, so one fish was put into each leg of the waders. That is what is done with many kelts in the Tweed district. I have known them to be tied to stones in a pool a whole night, and rescued at daybreak on the next day.'

I hope John has not inadvertently introduced this method to an undesirable element of the wider Wye "public".

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## ISLES OF THE WEST by IAN MITCHELL

(Canongate £9.99)

Reviewed by Jonathan Bulmer

This is a readable, entertaining and well-researched book. Ostensibly an account of a three month single-handed sailing trip through the Inner and Outer Hebrides in the summer of 1996, it is also a penetrating analysis of the roles and attitudes of the conservation agencies who have increasingly taken upon themselves the responsibility for environmental management in these remote and lovely places, both in response to a European bureaucracy which many see as heavy-handed and as major landowners in their own right.

The economic and demographic decline of the Hebrides goes back a long way. The clearances, the collapse of the kelp industry, the active suppression of the Gaelic language, potato blight, the wholly disproportionate sacrifice of manpower in two world wars, the vicissitudes of sea fishing (not helped by government policy and the strong pound), the false dawn of fish farming as an adjunct to crofting, expensive fuel and transport costs, and now the virtual unsaleability of cattle and sheep have all militated against the survival of the crofting way of life, and yet it has proved astonishingly resilient. Hence of course the conflict: the islands' problems are the environmentalists' opportunity. Too often the environmental organisations are staffed by southerners with a single issue agenda and no understanding of or sympathy for the communities who have after all created and sustained the plant and wildlife havens the outsiders are so eager to protect. This Ian Mitchell documents, island by island, in great detail.

His scorn is most cogently directed against the RSPB. Before setting out he contacted all the charitable agencies who had acquired landholdings along his route and asked for details of their policies and management plans. All were to a greater or lesser degree helpful except the RSPB, whose Public Relations Officer in Edinburgh, despite a huge PR budget, refused 'point blank' to help, and apparently instructed his officers on the ground to do likewise. Nevertheless, the author manages some enlightening, if awkward, interviews with the hapless representatives

which make hilarious reading. He also quotes Philip Coxon, onetime RSPB employee on North Uist who felt that, in a non-legal sense, he owned the ground he was employed to warden. Within a month of arriving – he had never set foot in the Outer Hebrides before – he was worried that 'a crofter could work all day, earning a living from the land, and claim his proprietorship would be as valid as mine.' The local response sums up much of the problem: 'Why should they pass lands which have been grazed by their animals for generations into the hands of a comparative stranger, working for a remote authority, all to a purpose which conflicted with traditional ideas of how land should be used?'

Ian Mitchell is highly critical of the Society's policies on corncrakes and geese, pointing out, provocatively enough, that the money spent on corncrakes in the Hebrides – in excess of £900,000 in 1996 – could be better spent on limiting the activities of the quail netters of the Nile Delta who trap some 10,000 migrating birds a year (shades of Orri Vigfusson and the North Atlantic Salmon Fund ...). He makes it clear that the Society's ambivalence on the control of geese – in many areas the greylag is a pest and by no stretch of the imagination endangered – and evasiveness on the subject of predation are driven by a vast fund raising machine and an overriding concern not to offend the suburban sensitivities of the membership. Foxes, polecats, ravens, hoodies, blackbacks, hedgehogs (introduced on South Uist by an English schoolteacher) and the feral cat (not of course that one dare mention the domestic variety, estimated to kill 100 million wild birds in Britain every year but too much beloved by 'bird lovers') are far more destructive of ground nesting birds than crofting husbandry could ever be – but this is simply not addressed. In 1999 feral mink, released some twenty-five years ago on Harris and Lewis where they have devastated terneries as well as breeding colonies of eider, shelduck and puffin, were for the first time trapped on North Uist. This is a potential ornithological disaster on the scale of a major oil spill and yet the RSPB, despite the unanimous urging of a seminar of experts from all over the world held in Stornoway in July, and an income (in 1996/97) of £37 million, has made no visible effort to confront or even acknowledge the problem.

Other agencies, such as the National Trust for Scotland, the John Muir Trust, the Scottish Wildlife Trust, the Ministry of Defence, and Forest Enterprise – all major land owners in the Hebrides – get a better press. One cannot but feel a certain sympathy for Scottish Natural Heritage, caught between the rock of endless European designations with their potentially crippling restrictions on local enterprise, and the very hard place of its statutory obligations to the Scottish Executive. Ian Mitchell cites some examples of ham-fistedness, insensitivity and plain bad PR (which he contrasts with the attitude of one local estate, which 'without any PR budget, just a little helpfulness and frankness, had knocked the bureaucracy into a cocked hat'). There are now however signs of a more sympathetic approach and in the Western Isles at least people are employed who have some understanding of crofting culture: the Lewis Peatlands Management Scheme for example is much less restrictive and more in tune with local requirements than previous designations and SNH has taken a proactive role in dealing with feral mink. On the other hand, despite continually pleading underfunding, it is prepared to indulge vast sums on such whimsical schemes as the reintroduction of the European beaver: another triumph for centralised bureaucracy over common sense. The only occasion on which a designation by SNH has been overturned on appeal (to the independent scientific adjudicating committee appointed by the Secretary of State) was the proposal for a seal sanctuary off the south coast of Islay. The basic objection was that it was contrary to the principle of biodiversity to protect a large and expanding population of a predatory species at the expense of a small and declining population of a prey species (the Atlantic salmon), particularly so when they have equal international conservation status.

Anyone with an interest in the politics of conservation should read this book. For those of us who have the good fortune to live in the Hebrides there is much evidence of the essential resilience of the island way of life, and for those who visit plenty to remind them of pleasures past – and to come. As Harold Nicolson said of his tenure of the Shiant Islands, echoed by the author, 'How lovely were the lovely moments; how bloody the bloody'.

One criticism: this otherwise well-produced book deserves an index and the publishers deserve censure for not providing one.

# THE ATLANTIC SALMON TRUST LIMITED

## SUMMARY FINANCIAL STATEMENTS FOR YEAR TO 31 MARCH 1999

| STATEMENT OF FINANCIAL ACTIVITIES | *Year to 31/03/99* | *9 Months to 31/03/98* |
|---|---|---|
| | £ | £ |
| Incoming Resources | | |
| Investment Income | 62,964 | 44,582 |
| Donations | 43,429 | 39,528 |
| Legacy | – | 100,017 |
| Postal Fishing Auction | 30,864 | 34,591 |
| Miscellaneous Income | 1,352 | 1,519 |
| **Total Income Resources** | 138,609 | 220,237 |
| Resources Expended | | |
| Direct Charitable Expenditure on Promotion of Salmon Conservation | 115,798 | 71,764 |
| Donations and Grants to Other Organisations | 676 | 1,226 |
| Publicity Expenditure | 9,593 | 7,782 |
| Fifth International Salmon Symposium (shared cost) | – | 6,724 |
| Investment Management Fee | 3,052 | 2,931 |
| Management and Administration of the Charity | 37,240 | 27,967 |
| **Total Resources Expended** | 166,359 | 118,394 |
| Net-Outgoing/Incoming Resources before Transfers | -27,750 | 101,843 |
| Net-Losses/Gains on Investment Assets | -6,485 | 195,847 |
| | -34,235 | 297,690 |
| Transfer-From/To Investment Reserve | 6,485 | -195,847 |
| Net Movement in Funds During the Period | -27,750 | 101,843 |
| Fund Balance Brought Forward at 31 March 1998 | 817,571 | 715,728 |
| **Fund Balance Carried Forward at 31 March 1999** | 789,821 | 817,571 |

| BALANCE SHEET | | |
|---|---|---|
| Fixed Assets | | |
| Tangible Fixed Assets | 91,894 | 67,349 |
| Investment Assets | 1,420,929 | 1,491,952 |
| **Total Fixed Assets** | 1,512,823 | 1,559,301 |
| Net Current Assets/Liabilities | 2,862 | -685 |
| **Total Net Assets** | 1,515,685 | 1,558,616 |
| Capital and Reserves | | |
| Accumulated Fund | 789,821 | 817,571 |
| Reserves | 692,084 | 698,569 |
| **Total Capital and Reserves** | 1,481,905 | 1,516,140 |
| Deferred Scientific Research Project Contributions | 33,780 | 42,476 |
| **Total Capital Employed** | 1,515,685 | 1,558,616 |

The summary Financial Statements have been prepared from the full accounts of the Trust, which have been audited by Henderson Loggie, Chartered Accountants. The comparative figures for last year are for nine months only due to a change in the accounting year.

# ATLANTIC SALMON TRUST LTD - TRUSTEES' ANNUAL REPORT FOR THE YEAR TO 31 MARCH 1999

The Trustees have pleasure in submitting the annual report and accounts of the Company for the year ended 31 March 1999.

## 1. Operational Review

a) ***Objectives of the Trust.*** The principal objective of the Atlantic Salmon Trust is to protect and enhance United Kingdom stocks of wild salmon and sea trout for the benefit of the community. It works for better fishery management at all levels, drawing to the attention of the appropriate authorities the particular dangers and problems, and offering advice to Government Ministers and their Departments and to the European Union. It promotes, encourages and directly finances practical scientific research, arranges workshops and international conferences and publishes booklets on matters of scientific and general interest about wild salmon and sea trout.

b) ***General Activities.*** During the period under report, the Trust was instrumental in the development of the International Atlantic Salmon Accord, a statement of the problems facing salmon and the actions needed to address them. This document was subscribed to by all of the Non Government Organisations accredited to the North Atlantic Salmon Conservation Organisation, at whose annual council meeting it was launched, and subsequently submitted by all signatories to their respective Governments. The Trust also contributed in large measure to the development of submissions to the on-going Review of Salmon and Freshwater Fisheries Policy in England and Wales. It was active in addressing the problem of the collapse of sea trout and salmon stocks in West Highland waters, seeking to involve all interests in concerted measures to improve the situation. In November, the Trust conducted a multi-disciplinary workshop on Problems Facing the Salmon in the Sea, the proceedings of which are in course of publication. The Trust contributed funding and effort towards the production of an instructional video demonstrating "catch and release" techniques to conserve threatened stocks of early-running ("spring") salmon. Three new "Blue Books" were published during the period.

c) ***Scientific Research Sponsored or Financed by Other Organisations.*** Expenditure of £24,125 on the Trust's major project, a DNA-related study into the maximisation of progeny numbers from natural spawning, was financed in part by generous sponsorship from the Robertson Trust and the Fishmongers' Company. The Trust acted as an agent on behalf of other organisations in respect of six further projects, for a total expenditure of £61,949. Details are contained in Note 6 to the Accounts.

d) ***Scientific Research Projects Financed by the Trust.*** The Trust directly supported a total of nine projects during the period. No contribution exceeded £6,000, and five of the projects involved concurrent population studies by West Coast Fisheries Trusts. Other projects included a study of seal predation on the River Conon and an investigation into the physiological effects on sea trout of sea lice infestation. Total expenditure was £19,000; details are contained in Note 7 to the Accounts.

e) ***Staff.*** The permanent staff of the Trust during the period comprised the Director and his Secretary, working at the Trust's office in Pitlochry, the Deputy Director, working from home in the south of England, the Trust's biologist, based at the Marine Laboratory Aberdeen, and the Treasurer. Mr. Peter Tomlin, who had served as Treasurer since 1985, sadly had to relinquish the position in December 1998, due to ill health. The Trustees wish to record their especial gratitude for his conscientious and devoted service over many years, and to welcome his successor, Mr. John Gray.

f) ***Year 2000.*** The directors have assessed the risk that the company's business and operations will be affected by issues resulting from the potential impact of the year 2000 on computer and related systems. They are satisfied that the company's own systems are compliant and that there should be no adverse effect on the company's operations.

g) ***Introduction of the single European currency.*** The directors are considering the implications of the introduction of the Euro on the company, and as far as is known at this time are of the view that this is unlikely to have a detrimental effect on the company.

h) ***Auditors.*** Since the last Annual General Meeting, Davies Watson resigned as auditors as a consequence of the new Treasurer being domiciled in Scotland, and Henderson Loggie were appointed to fill the vacancy. In accordance with Section 385 of the Companies Act 1985, a resolution for the appointment of Henderson Loggie as auditors of the company is to be proposed at the forthcoming Annual General Meeting.

## 2. Financial Review

a) As a result of the change in the financial year end, the figures shown for 31 March 1998 are for nine months only. Care therefore needs to be taken when comparing the two sets of results (because income and expenditure do not necessarily accrue on a monthly basis.)

b) An operating loss of £27,750 was incurred in the year to 31 March 1999, compared with a surplus of £1,826 in the previous period (excluding the legacy of £100,017 from Charles Knight). There were a number of contributing factors. Large donations which have been a feature in recent years showed a marked reduction. The income from the Postal Fishing Auction was also down. Direct charitable expenditure on promotion of salmon conservation was increased during the year, and management and administration costs were also higher.

c) The net deficit is shown after adjusting for profit of £18,034 made on the sale of certain investments and allowing for a reduction of £24,519 in the valuation of the investment portfolio at the year end. This follows the very significant increase in the valuation last year of £187,473.

d) The Balance Sheet continues to show a strong financial position with net assets at the year end valued at £1,515,685.

e) During the year, tax recovered on investment income amounted to £6,426. This recovery will reduce to nil over the next five years as a result of changes introduced in the last Budget.

f) Partly as a result of this change, a review of the Trust's current investment strategy is being considered. A fund raising initiative is also being undertaken.

## 3. Legal and Administrative Information

The SORP issued by the Charity Commissioners for England and Wales requires certain legal and other administrative information to be supplied by Trustees of registered charities as part of their annual report. This information is detailed below, or is included elsewhere in the report.

a) The full name of the charity is the Atlantic Salmon Trust Limited, incorporated on 21 April 1967 under the Companies Act 1948 as a company Limited by Guarantee and not having a share capital. The governing document is the Memorandum and Articles of Association.

b) The company is registered as a charity with the Charity Commissioners for England and Wales under number 252742; the company registration number is 904293.

c) The names of the charity Trustees who have acted at any time during the accounting year ended 31 March 1999 are listed in the Appendix to this Report. All Trustees comprise members of the Council of Management, the governing body of the Trust responsible for policy and the general administration of the Trust's activities. The method of appointment or election of Trustees is governed by the Trust's Memorandum and Articles of Association which, inter alia, also provides for the periodic retirement by rotation of Council of Management members and their re-election, where appropriate.

d) It is intended that the Financial Review and other matters contained in the Trustees' Annual report shall also serve as the Director's Report required by Section 234(1) of the Companies Act 1985. In that connection, the names of the Trustees who were also Directors of the Trust during the year ended 31 March 1999 were as follows:

The Duke of Wellington
The Lord Nickson
The Lord Moran
Colonel HFO Bewsher, (Chairman)
Major General JCOR Hopkinson (Vice-Chairman)

The Trustees report with regret the death on 3 November 1998 of Mr. David Clarke, who also acted as a Director during the year.

e) The Trustees confirm that the Trust's governing document does not impose any specific restrictions on the manner in which the charity is empowered to operate.

f) The Trust's investment powers are governed by Clause 3(L) of the Memorandum and Articles of Association, which places no restriction on the nature of the securities or property concerned. In practice, investment in shares and securities is restricted to equities and loan stocks (government and corporate) quoted on the London Stock Exchange. The freehold property at Moulin, Pitlochry is a permanent acquisition and is not held as an investment.

Signed on behalf of the Trustees

**Colonel HFO Bewsher**
Chairman

**Major General J.C.O.R. Hopkinson**
Vice Chairman

[Copies of the full accounts may be obtained from the offices of The Atlantic Salmon Trust]

# ATLANTIC SALMON TRUST PUBLICATIONS

| | | £ |
|---|---|---|
| **Atlantic Salmon: Planning for the Future**<br>(Proceedings of the 3rd International Atlantic Salmon Symposium, Biarritz, 1986) | edited by D. Mills & D. Piggins | 45.00 |
| **The Biology of the Sea Trout**<br>(Summary of a Symposium held at Plas Menai, 24-26 October 1984) | E.D. Le Cren | 1.50 |
| **Salmon Stocks: A Genetic Perspective** | N.P. Wilkins | 1.50 |
| **Report of a Workshop on Salmon Stock Enhancement** | E.D. Le Cren | 1.50 |
| **Salmonid Enhancement in North America** | D.J. Solomon | 2.00 |
| **Salmon in Iceland** | Thor Gudjonsson & D. Mills | 1.00 |
| **A Report on a Visit to the Faroes** | D. Mills & N. Smart | 1.00 |
| **Atlantic Salmon Facts** | D. Mills & G. Hadoke | f.o.c |
| **The Atlantic Salmon in Spain** | C.G. de Leaniz, A.D. Hawkins, D. Hay & J.J. Martinez | 2.50 |
| **Salmon in Norway** | L. Hansen & G. Bielby | 2.00 |
| **The Automatic Counter – a Tool for the Management of Salmon Fisheries**<br>(Report of a Workshop held at Montrose, 15-16 September 1987) | A. Holden | 1.50 |
| **A Review of Irish Salmon and Salmon Fisheries** | K. Vickers | 1.50 |
| **Water Schemes – Safeguarding of Fisheries**<br>(Report of Lancaster Workshop) | J. Gregory | 2.50 |
| **Genetics and the Management of the Atlantic Salmon** | T. Cross | 2.50 |
| **Fish Movement in Relation to Freshwater Flow and Quality** | N.J. Milner | 2.50 |
| **Acidification of Freshwaters: The Threat and its Mitigation** | R. North | 3.00 |

| | | |
|---|---|---|
| **Strategies for the Rehabilitation of Salmon Rivers**<br>(Proceedings of a joint Conference Held at the Linnean Society in November 1990) | D. Mills | 5.00 |
| **Salmon Fisheries in Scotland** | R. Williamson | 3.00 |
| **The Measurement and Evaluation of the Exploitation of Atlantic Salmon** | D.J. Solomon & E.C.E. Potter | 3.00 |
| **Salmon in the Sea and New Enhancement Strategies**<br>(Proceedings of the 4th International Atlantic Salmon Symposium, St. Andrews, New Brunswick, June 1992) | edited by D. Mills | 30.00 |
| **Surveying and Tracking Salmon in the Sea** | E.C.E. Potter & A. Moore | 3.00 |
| **Problems with Sea Trout and Salmon in the Western Highlands** | edited by R.G.J. Shelton | 3.00 |
| **Automatic Salmon Counting Technologies - A Contemporary Review** | G.A. Fewings | 3.50 |
| **Salmon in the Dee Catchment: The Scientific Basis for Management**<br>(Proceedings of a one day meeting held at Glen Tanar House, 13 October 1994) | A. Youngson | 3.50 |
| **Spring Salmon** | A. Youngson | 3.00 |
| **Enhancement of Spring Salmon**<br>(Proceedings of a one day Conference held at the Linnean Society of London 26 January 1996) | edited by D. Mills | 12.00 |
| **Water Quality for Salmon and Trout**<br>(second, revised edition) | J. Solbé | 3.50 |
| **Salmon Fisheries in England & Wales** | W. Ayton | 3.50 |
| **The Industrial Fishery for Sandeels** | A.D. Hawkins J. Christie & K. Coull | 3.00 |
| **Fish Counters**<br>(Proceedings of an AST/IFM Seminar held in Perth on 4 April 1997) | edited by A.V. Holden & G. Struthers | 3.00 |
| **The Ocean Life of Atlantic Salmon**<br>(Proceedings of a Workshop held in November 1998) | edited by D. Mills | 29.75 |

*Price reflects 50% discount available on orders placed by AST supporters*
*P+P: UK £2.50, Europe £3.50, Rest of world £5.00.*

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