

**Briefing (required by 13 January) for Package
meeting scheduled for 24 January 2012**

Case Reference Number: EU pilot 2094/11/ENVI

**Attendees (Policy/Legal) at the meeting in London on Tuesday
24 January 2011:**

[REDACTED] (Defra Migratory and Freshwater Fisheries)
[REDACTED] (Defra Marine and Fisheries Science Unit)
[REDACTED] (Defra Marine Biodiversity (European and International) Team)
[REDACTED] (Scottish Government – *by telephone*)
[REDACTED] (Scottish Government – *by telephone*)
[REDACTED] (Scottish Government – *by telephone*)
[REDACTED] (Scottish Government – *by telephone*)
[REDACTED] (Scottish Government Europe Team) (*in an observation
capacity*)
[REDACTED] (Scottish Government Europe Team) (*in an observation
capacity*)

Key issues of case:

- The original complaint (16/6/11) concerned (in part) the UK's alleged failure to protect wild salmonid populations as required by Habitats Directive Articles 6(2) and (3) from negatives impact of Scottish salmon farming on wild salmon – in particular the effect of sea lice and escaped fish.
- The Commission's assessment of the UK response (provided 24/8/11) has identified two outstanding issues which they now wish to discuss:
 - Sea lice, identified as an area of concern in discussions with the Irish authorities: the Commission request a general discussion including in particular relevant recent research, and information on data collected (in particular in Scotland) on sea lice counts.
 - Increased mortality of salmon in the marine phase of the life cycle: the Commission would like to understand what research has been undertaken by UK authorities in Scotland, England and Northern Ireland to understand the causes of this decline and what action has been taken to address it.

Objectives for the meeting:

The objective of the meeting is deferral of any ensuing infraction proceedings relating to failure to protect wild salmonid populations in SACs where they are a designated SAC feature. Hope to provide responses to reassure the Commission that we take the issue of sea lice and their potential impacts seriously, to avoid this progressing to a full infraction case. We are happy to propose a follow-up meeting to discuss in more detail if that would be helpful.

Brief summary of argument:

Sea lice:

The Scottish Government takes the issue of sea lice very seriously and continues to commission research on sea lice and wild fish interactions. There is no scientific evidence of an impact of lice from fish farms on wild salmon in Scotland. Fish farmers in Scotland have a statutory obligation to maintain records of sea lice numbers. Measures are proposed in the Scottish Government Aquaculture and Fisheries Consultation to help improve sea lice management and provide for collection/publication of sea-lice data.

No salmon farms exist in coastal waters of England and Wales, nor have there been observations of high sea lice loads on wild English/Welsh salmon or sea trout; this is not therefore a current research priority in England and Wales.

Salmon marine mortality: UK authorities have contributed to the NASCO SALSEA programme in a number of areas, focussing on both freshwater and marine factors that affect salmon marine mortality. Great Britain has had legislation in place since the 1970s prohibiting fishing for salmon at sea (beyond six nautical miles from baselines). In terms of other actions to be taken, there is little that we know of, to date, that can be done to protect salmon at sea, so the focus has been on protecting and enhancing freshwater production. This effectively encompasses much of the day-to-day management of salmon (see for example the NASCO Implementation Plans).

Background to case:

Sea lice:

There is no scientific evidence of an impact of lice from fish farms on wild salmon in Scotland. There is evidence that declines in rod catches have been steeper on the Scottish west coast than elsewhere in Scotland, which some (notably wild fisheries interests) argue are due to the effects of fish farming; but analyses do not provide clear evidence of causative mechanisms.

The Scottish Government takes the issue of sea lice very seriously and continues to commission research on sea lice and wild fish interactions. The attached paper provides an overview of the issues and existing research. Copies of a PowerPoint presentation and fact sheet are also enclosed, outlining the Scottish Government's perspective/work on sea lice research. Key elements of recent or ongoing research/work include:

- Understanding dispersal of/risk from sea lice: aims to develop a sea lice dispersal model for Loch Linnhe, including tracking of smolts to estimate routes taken and how long spent in different parts of the Loch on their outward migration; plans for dispersal modelling in larger scale areas.
- Research/work on selective breeding for resistance; pharmaceutical companies working with industry to ensure optimal administration and efficacy of products; use of wrasse as a biological control, including culture of the species; industry also work to a voluntary code to ensure best practice is followed; and novel research into the use of semio-chemicals;
- In November 2011 Scotland hosted two significant sea lice events: international sea lice symposium and third multinational sea lice meeting, bringing together experts from all major salmon producing countries with focus on research, achievements and progress. A sea lice research meeting was also held in May 2011; and
- Marine Scotland is currently repeating earlier analysis of declines in rod catches of salmon using other catch indices, with the preliminary results supporting the original findings.

Fish farmers in Scotland have a statutory obligation to maintain records of sea lice numbers at marine sites and make available for Government inspection. Scottish Government does not itself hold sea lice data from fish farms.

It has proved very difficult to collect sea lice data directly from wild salmon smolts in Scotland due to the limited time they spend in inshore environments. However, Scottish Government funds work – including via a Managing Interactions Working Group with key wild fisheries representation – to assess the incidence of sea lice on wild sea trout. In the absence of other information this can be used to indicate changes in lice levels in the environment.

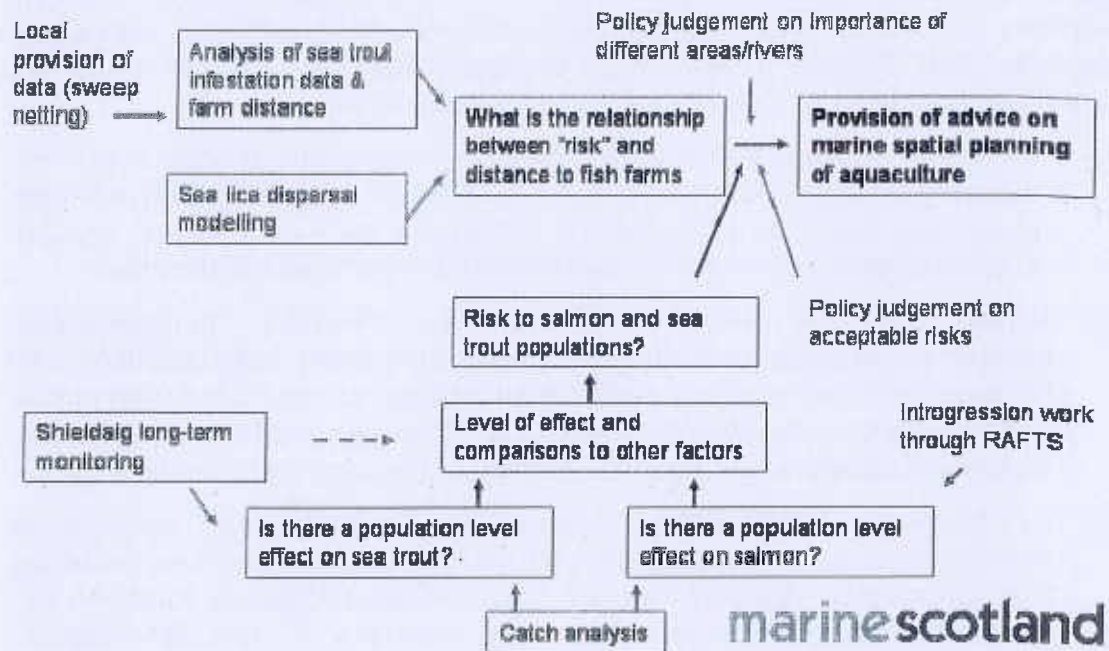
As explained in the response to the original complaint, other work is underway and measures are proposed in the Scottish Government Aquaculture and Fisheries Consultation to help improve sea lice management and provide for collection/publication of sea-lice data. As we have indicated previously, we would be happy to meet Commission officials to discuss sea lice research and related issues further, if that would be helpful.

No such farms exist in England and Wales, nor have there been observations of high sea lice loads on wild English/Welsh salmon or sea trout; this is not therefore a current concern or research priority in England and Wales.

Farm location summary/wild-farm interaction diagram/sea lice topic sheet below.

Aquaculture-Wild Fish Interactions

Goal: objective unbiased science on which to base advice



Green = science areas
 Blue = provision of local data
 Red = policy framework

 Farm location evidence summary.pdf

 MSS sea lice research.pdf

marinescotland

Research on increased marine mortality of salmon and action taken:

NASCO set up the International Atlantic Salmon Research Board to implement a comprehensive programme of research on marine mortality of salmon (SALSEA), including freshwater factors affecting them, and salmon in the open ocean. The main research areas addressed by the UK have been:

- obtaining time series of data on marine survival and exploitation;
- analysis of scales to investigate growth and mortality, and stable isotope and trace element compositions in relation to variations in the marine environment;
- effects of contaminants in freshwater derived from intensive agriculture and aquaculture facilities on growth and survival including in saltwater;
- effects of conditions during the early life history stages in freshwater on behaviour and subsequent survival within the marine environment;
- establishment of baseline information on the genetic character of breeding populations within and among rivers in Britain to allow genetic stock identification of salmon at sea.

Northern Ireland operate the Bushmills Salmon research station on the river Bush which allows for total trapping and full count of migrating smolts and adults, providing internationally important data. Management responses to increased marine mortality include a DCAL area voluntary netting buyout initiated in 2002; a DCAL carcass tagging/logbook scheme introduced in 2001; angling restrictions including catch-and-release and bag limits in different parts of the season.

The Scottish Government operate internationally important traps on the Dee and North Esk which produce direct measurements of the marine mortality of salmon. In addition to their use for national management, data from these facilities feed into international management through ICES and NASCO.

As well as a decline in numbers, commercial catch sampling has recently revealed a decline in the condition of returning adult salmon. Research is underway to investigate the consequences of this reduction in condition for salmon stocks as a whole.

Marine Scotland participated in the recent SALSEA project which is an international programme of co-operative research designed to improve understanding of the migration and distribution of salmon at sea in relation to feeding opportunities and predation. This project produced the genetics tools that will allow salmon being caught at sea to be traced back to their natal region, opening up the potential for gathering information on different stocks in the marine environment. Marine Scotland is also developing a program of work aimed at examining the coastal movements of salmon.

SUMMARY OF RESEARCH UNDERTAKEN ON SALMON MORTALITY IN THE SEA IN UNITED KINGDOM

	Jurisdiction	Title	Status	Objectives	Years
1.	England and Wales	Salmonid migration and climate change	Completed	Describe and model the environmental factors affecting the migration of salmonids and investigate the effects of climate change on salmonid migration and survival both in fresh water and the sea.	1999 - 2004
2.	England and Wales	Impacts of agricultural contaminants on wild salmonids	Completed	Describe the nature and extent of the impacts of aquatic containments on migration and marine survival of salmonid smolts and post-smolts.	1999 - 2004
3.	England and Wales	Impact of intensive in-river aquaculture on wild salmonids	Completed	Describe the nature and extent of the impact of aquatic contaminants derived from intensive freshwater aquaculture (effluents, pesticides, antibiotics and hormones) on reproduction and migration of wild salmonids.	2001 - 2005
4.	England and Wales	Modelling the bioenergetics of Atlantic salmon migration	Completed	Model the energetic requirements of salmon during their marine migrations and predict the effects of environmental and oceanographic changes on smolt growth and survival.	2002 - 2005
5.	England and Wales	Cardiff Bay Fisheries Monitoring Programme	Completed	Assess the impact of Cardiff Bay barrage on salmon stocks of the rivers Taff and Ely.	1990 - 2006
6.	England and Wales	Atlantic Salmon Arc Project, ASAP	Completed	Define exploitation at sea on a regional basis using genetic tools. Create a long-term database for these studies and create an international management tool to inform decision-making.	2004 - 2008
7.	England and Wales	Diffuse pollution and freshwater fish populations	Completed	Investigate the role of diffuse aquatic contaminants in regulating populations of freshwater fish with particular reference to salmonid stocks and fisheries.	2005 - 2010
8.	England and Wales	The influence of the freshwater environment on salmonid populations	Completed	Investigate the impact of environment change on juvenile salmon production and ecology. One aspect of the research directly related to marine survival is the potential role of assessment techniques (trapping, anaesthetisation tagging) in influencing marine survival.	2005 - 2010
9.	England and Wales	Factors affecting the distribution and behaviour of salmonid populations	Completed	Investigate the habitat requirements of adult salmonids within the estuarine and freshwater environments. One key element of the research is to investigate how changes in prey availability within the marine environment may influence recruitment of stocks between years.	2005 - 2010
10.	England and Wales	Genetic sampling to type British salmon stocks	Ongoing	Coordinate and support the establishment of baseline information on the genetic character of breeding populations within and among rivers in Britain.	2008 - 2010 Data analysis ongoing

11. England and Wales	Deriving estimates of marine survival and exploitation for monitored river stocks in England and Wales	Ongoing	Establish 'monitored' rivers where estimates of marine survival can be derived and compared with other North Atlantic stocks.	Annual
12. England and Wales	The marine life of Atlantic salmon : evidence from the microchemistry of scales	Completed	Measure the stable isotope and trace element compositions from salmon scales in relation to variations in the marine environment and develop a model to predict impacts of changes in the marine environment on return rates of salmon.	2007 – 2010
13. England and Wales	Development and application of salmonid life cycle models	Ongoing - New entry	Review available models to assess suitability and to build on existing models or develop new models to <i>inter alia</i> compare marine and freshwater factors affecting stocks.	2009 – 2013
14. England and Wales	The impacts of contaminants and temperature on freshwater fish populations	Ongoing	Further study the impacts of contaminants derived from intensive agriculture and aquaculture facilities on wild salmonids and investigate the implications of predicted climate change scenarios on the impacts of different sources of diffuse and point source pollution on wild fish populations.	2009 – 2014
15. England and Wales	Impacts on juvenile salmonid populations from a changing freshwater environment.	Ongoing	Investigate how predicted changes in the freshwater environment might impact on juvenile salmonid populations and how changing conditions during the early life history stages may influence their behaviour and subsequent survival within the marine environment.	2009 – 2014
16. England and Wales	The marine life of Atlantic salmon : stable isotope records of feeding location, stock separation and marine climate influences	ongoing	Using stable isotope analysis and building on previous research to identify river stocks that migrate to common or distinct marine areas to feed, and to test whether differences in the ocean conditions in these differing areas significantly affect marine mortality.	2009 – 2013
17. Northern Ireland	Development of conservation limits, pre-fishery abundance and management of the Foyle salmon fishery	Completed	To build upon the existing Foyle salmon management system, to develop it into a precautionary catch advice framework that fully takes account of biological data on stock abundance and which fulfils all the main requirements of the Precautionary Approach.	2005 - 2008
18. Northern Ireland	The marine survival of Atlantic salmon from the River Bush, Northern Ireland	Ongoing	Investigate factors influencing the survival at sea of salmon smolts migrating from the River Bush until their return as adults.	Annual
19. Scotland	Testing and development of Institute of Marine Research (IMR), Bergen, Norway, salmon trawl gear	Completed	Test a prototype trawl developed by IMR, Bergen, Norway, which, rather than capturing post-smolts, records, by use of CCTV, their passage as they pass through an open-ended trawl net. A supplementary objective, dependent on the success of the gear trials, was to conduct a post-smolt survey at the shelf edge.	2006

20. Scotland	Protecting salmonid fisheries from seal damage	Completed	Develop and apply new molecular tools for discriminating among species of fish in the diets of seals from their remains in scats. Test the possibility of using molecular tools to quantify the occurrence of diet components. Develop and deploy cetacean-friendly seal-scarer. Characterise behavioural interactions between salmon and their predators and seals and their prey. Investigate the digestion of otoliths during passage through a seal's gut.	2003 - 2008
21. Scotland	Post-smolt mortality of Atlantic salmon	Ongoing	Assess post-smolt mortality rates of Atlantic salmon from three Scottish rivers, and the contribution of these salmon to fisheries that exploit them.	Annual
22. Scotland	Analysis of post-smolt life history by scale reading	Ongoing	Investigate the relationship between growth and mortality, particularly during the marine phase, by analysis of scale growth patterns.	Annual
23. Scotland	Fisheries-induced evolution	Ongoing	Determine the incidence and extent of heritable genetic changes in salmon stocks due to fishery programmes.	2007-2010 Data analysis ongoing
24. Scotland	Size and condition of returning grilse (1SW) and MSW salmon	Ongoing	Investigate decadal trends in the size and condition of adult salmon returning to Scotland.	Annual
25. Scotland	Development of a General Spatial Model of within river population structuring in Scottish Atlantic salmon (POPMOD)	Ongoing	Improve the scientific basis for inter alia setting biologically appropriate conservation limits, providing advice on conservation and restoration initiatives, accurately and cost-effectively monitoring the status of salmon stocks. This project will provide baseline information in support of project E2.	2008 - 2011
26. Scotland	Focusing Atlantic salmon management on Atlantic salmon (FASMOP)	Ongoing	Establish the number and spatial boundaries of breeding populations of salmon within any Scottish river system; establish the ancestral relationships and functional biological differences between wild salmon stock components across Scottish rivers; improve local management practice and increase the focus of management on local breeding populations. This project will provide baseline information in support of project E2.	2009 - 2011