NEWS RELEASE 16 May 2008

From the Atlantic Salmon Trust and NASCO

WHY ARE SALMON DYING AT SEA? INTERNATIONAL PROJECT USES DNA TECHNOLOGY TO "FINGERPRINT" SALMON AT SEA

The most ambitious research programme ever undertaken into wild Atlantic salmon begins in earnest today. The unique international scientific mission, to investigate the increasing mortality of salmon at sea, sails today (Friday 16th May) from the port of Killybegs in Donegal in western Ireland aboard the research vessel *RV Celtic Explorer*. The project – SALSEA-Merge – is designed to explore and understand the migration and distribution of salmon in the North-East Atlantic. It involves three marine survey voyages during both 2008 and 2009 and will use cutting edge DNA technology.

The £4.5 million SALSEA-Merge project, a public private partnership, is funded by the European Union with significant contributions from a consortium of interested parties including the Atlantic Salmon Trust, the North Atlantic Salmon Conservation Organisation's International Atlantic Salmon Research Board (IASRB) and the TOTAL Foundation. The project is a key component of the IASRB's SALSEA Programme, which also includes freshwater, estuarine and inshore components. Full information can be accessed online at www.salmonatsea.com

The project's mission is, through following juvenile salmon from southern Europe to the Barents Sea in the far North, to map the migration and the distribution of salmon stocks at sea using cutting-edge genetic fingerprint technology, which has already facilitated the mapping of all of the major salmon stocks in Europe. Using methods similar to the DNA analysis used in tracking criminals, it identifies individual fish caught at sea by analysing their natural genetic code, which can then be matched back to their region or river of origin.

Dr Ken Whelan, President of NASCO and Chairman of NASCO's International Atlantic Salmon Research Board (IASRB), explained: "An increasing proportion of salmon are dying at sea. Wild salmon face extinction in some southern rivers on both sides of the North Atlantic and no one fully understands why. There are many theories and far more questions, but as yet no sound research base on which rational action can be taken. That is what SALSEA-Merge is all about – to provide answers".

Tony Andrews, Director of the Atlantic Salmon Trust, commented: "The Atlantic Salmon Trust has supported SALSEA from the beginning. This vital multi-national project now has the resources to research the mysteries of the salmon's life at sea. Our commitment to SALSEA is based on the need to understand how Atlantic salmon are coping with unprecedented changes in the North Atlantic marine environment caused by climate change and why stocks have declined so dramatically in the last 40 years".

Mr Andrews continued: "Research on its own will not be enough to prevent salmon stocks declining further. It should be seen as the precursor to concerted action, without which the future of the salmon is in peril**.** Armed with the facts we will join with other UK salmon organisations to persuade governments to act to prevent further decline. This project is not just about salmon because they, like sharks and tuna, are long range migrants and thus are barometers of the health of the marine environment".

Dr Malcolm Windsor, Secretary of NASCO, said: "It is very difficult to conserve and restore salmon stocks against a backdrop of increasingly poor marine survival. In the last three decades we have made tremendous advances in our knowledge of salmon in the freshwater environment. However this work may all be in vain if we cannot arrest the fall in marine survival. The SALSEA Programme seeks to identify the factors causing the increased mortality of salmon at sea and the opportunities to counteract them".

SALSEA-Merge is a unique partnership of geneticists, ecologists, oceanographers and ocean modellers who have pooled their talents to address a vital issue. In addition to the EU funded SALSEA-Merge programme, there is also a parallel programme taking place in August of this year with Canadian and US involvement; their survey will match in the North-West Atlantic what the SALSEA-Merge programme is undertaking in the east. There will also be an extended international sampling programme at West Greenland, which began in 2007.

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Website: www.salmonatsea.com Photos of research ship and trawl-gear available on request

For further information contact:

Atlantic Salmon Trust 3/11 King James IV Business Centre Friarton Road Perth PH2 8DG Tel: 01738 472032 email: director@atlanticsalmontrust.org www.atlanticsalmontrust.org	NASCO 11 Rutland Square Edinburgh EH1 2AS Tel: 0131 228 2551 email: hq@nasco.int www.nasco.int www.salmonatsea.com

Issued by Andrew Graham-Stewart (01863 766767 or 07812 981531) on behalf of the Atlantic Salmon Trust and NASCO.

Notes to editors

1) The Atlantic Salmon Trust is an Atlantic-wide, UK based, charitable organisation, which champions wild salmon and sea trout.
2) NASCO is an inter-governmental organization formed to promote the conservation, restoration, enhancement and rational management of salmon stocks in the North Atlantic Ocean.
3) **SALMON SURVIVAL AND OUR CHANGING OCEANS**

Climate-induced changes in the ocean ecosystems are a cause for considerable concern. Some are warming, some are cooling and melting ice is diluting the upper layers of the northern and southern oceans; there is increasing evidence that currents are changing. First to encounter these changes are the long-distance migrants that traverse these troubled zones – the sharks, the tunas and the salmon.

Wild salmon numbers declined dramatically in the late 20th century. Over the last 30 years substantial resources have been spent on research to understand the life cycle of the salmon, its interaction with its environment, and the threats that it faces – leading to a much clearer understanding of the salmon in rivers and inshore waters. This knowledge has led to a cleaner environment, fewer obstructions, improved habitat and reduced commercial exploitation. However, salmon numbers have continued to decrease. A key reason is that fewer salmon are returning from the ocean. An increasing proportion of

salmon are dying at sea. Marine survival has fallen from 25 per cent or more in the 1960s to less than 10 per cent now. In some southern rivers on both sides of the North Atlantic wild salmon face extinction. No one fully understands why; theories abound but as yet there is no sound research base on which rational action can be taken.

Research in the open ocean is very expensive, requiring international collaboration. Until now it could not promise clear and comprehensive results but recent advances in DNA analysis make it possible to identify from a single fish scale the river population to which a salmon belongs – a natural genetic 'identity tag'. Scientists are compiling a genetic river atlas for the North Atlantic salmon population.

The SALSEA-Merge programme, with its carefully-targeted series of ocean surveys, is designed to use new and emerging technologies in the fastest and most comprehensive way to gain knowledge on which action can be taken. The programme will map salmon distribution and movement throughout the North Atlantic and monitor the health of the fish and the chemical and physical characteristics of their environment. Innovative new trawl-gear that records salmon numbers passing through the net and enables live capture has been developed and tested.

The knowledge acquired will not only help the salmon. Each wild salmon traverses a spectrum of aquatic environments from freshwater to ocean brine, physiologically changing in response to each environment and sensitive to the quality of its surroundings. The research will therefore provide a significant advance in understanding changes in the ocean environment, their effects on the creatures that live there and, ultimately, their effects on our own lives. On present evidence this task is of the utmost urgency. The preservation of genetic diversity is essential for wild salmon populations. Understanding the causes of marine mortality is fundamental to the future management of wild salmon stocks and will underpin the major investment that has been made, throughout the North Atlantic, to conserve this iconic species. Only the full picture of the salmon entering, living in and leaving its ocean environment will yield information that can be acted on with confidence.

4) **THE ORGANIZATIONS AND INDIVIDUALS BEHIND SALSEA**

IASRB - The International Atlantic Salmon Research Board

The SALSEA programme has been devised by the IASRB, which encourages, initiates, coordinates and administers research activities in relation to the salmon's marine phase, and advises NASCO on action to be taken. The Board consists of representatives from the NASCO Parties and the 34 affiliated NGOs. IASRB is legally entitled to receive and manage funds from both governmental and non-governmental sources. Since 2005 NASCO members and the collaborating NGOs have to date, through the IASRB, committed some £5 million annually to the SALSEA programme.

The Chairman of the IASRB is Dr Ken Whelan (Ireland). Dr Malcolm Windsor is the Secretary of the IASRB. The IASRB has a Scientific Advisory Group, chaired by Dr Lars Petter Hansen (Norway), which identifies research priorities, enhances co-ordination and advises on research proposals.

SALSEA Steering Committee

Dr Ken Whelan (Ireland) Chairman of IASRB
Mr Guy Beaupré (Canada) Director General, International Affairs, Fisheries & Oceans Dept
Mr Raoul Bierach (Norway) Directorate for Nature Management
Mr David Dunkley (Scotland) Marine Directorate, Scottish Government
Mr Patrick Keliher (USA) Executive Director, Maine Atlantic Salmon Commission
Mr Espen Farstad (Norway) Norwegian Association of Hunters and Anglers
Mr Niall Greene (Ireland) Chairman, Salmon Watch Ireland
Mr Patrick Martin (France) Conservatoire International du Saumon Sauvage
Mr Tony Andrews (UK) Director, Atlantic Salmon Trust
Mr William Taylor (Canada) President, Atlantic Salmon Federation