

International Management of Atlantic Salmon

Prior to the 1960s, fishing for and management of Atlantic salmon was predominately a national affair. The United States worried about “*their*” salmon, Canada worried about *theirs*, Norway about *theirs*, etcetera, etcetera. Unlike humans, however, Atlantic salmon are oblivious to political boundaries as they migrate from their homewaters to the North Atlantic Ocean where they merge with stock from other continents, feed and over-winter.



NEST fishery manager Rory Saunders visits a Greenland market where Atlantic salmon and a variety of other species representing seabirds and marine mammals are available for purchase by locals.

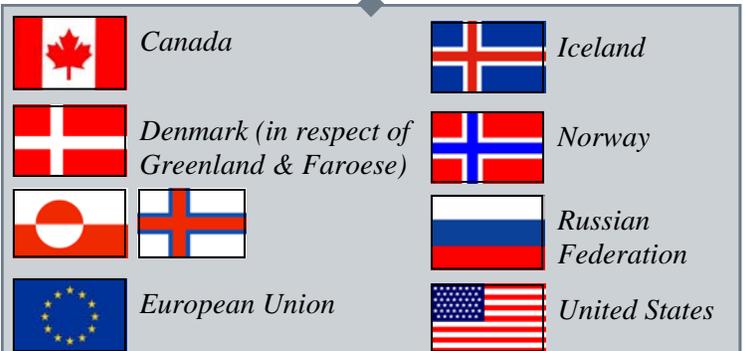
With the rapid expansion of the West Greenland, Faroese Island and Norwegian Sea *interception* fisheries (those that capture Atlantic salmon originating from other countries at feeding and over-wintering areas) in the 1960s, the need for international cooperation and management of Atlantic salmon became apparent.

Discussions between the countries that house salmon-producing rivers (*States of Origin*) and those countries (such as Greenland) that border the feeding/over-wintering areas (*Distant Water Countries*) began in 1978 at an international meeting sponsored by the Atlantic Salmon Trust and the Atlantic Salmon Federation. This meeting called for an international treaty agreement which would set limitations on fishing and provide a forum for cooperative research and management.

In 1982, the final version of the “Convention for the Conservation of Salmon in the North Atlantic Ocean” (the Convention) was adopted, entering into force in October 1983. The Convention created a new inter-governmental organization, the North Atlantic Salmon Conservation Organization (NASCO), to ensure that the burden of Atlantic salmon conservation was shared by both States of Origin and Distant Water Countries. The signing of the Convention was only the beginning of the international effort to manage Atlantic salmon fisheries.

For more information about NASCO, please visit www.nasco.int/

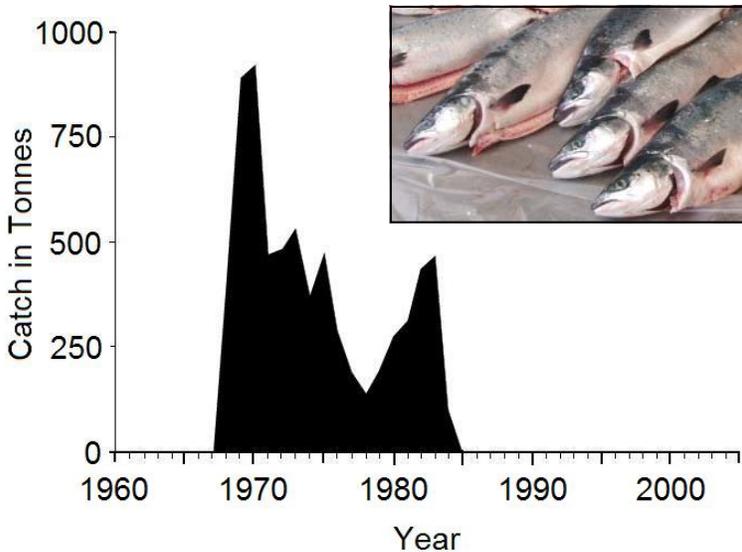
The Parties to NASCO in 2006 include Canada, Denmark (in respect of Greenland and the Faroe Islands), the European Union (which represents all member states of the EU with Atlantic salmon interests), Iceland, Norway, the Russian Federation, and the United States.





“The purpose of NASCO is to promote (1) the acquisition, analysis, and dissemination of scientific information pertaining to salmon stocks in the North Atlantic Ocean and (2) the conservation, restoration, enhancement and rational management of salmon stocks in the North Atlantic Ocean through international cooperation.”

Interception fisheries were initially considered to be *The Problem*. A major provision of the Convention with the most immediate effect was to prohibit fishing for Atlantic salmon beyond the areas of fisheries jurisdiction of member nations (i.e. 12 nautical miles from land). This led to the quick elimination of the capture fishery that had been taking place in the northern Norwegian Sea which had harvested as much as 1,000 tons of Atlantic salmon in 1970.



Graph depicting commercial catches of Atlantic salmon from the Norwegian Sea (1960-2005).

Within NASCO, regulatory measures are negotiated for the West Greenland and Faroe Islands fisheries. When negotiating quotas, the Commissions take into account the efforts of States of Origin to implement and enforce measures for the conservation, restoration, enhancement and rational management of stocks originating from their rivers. States of Origin have a responsibility to ensure they have taken appropriate management measures at home if they have an expectation that fisheries of Distant Water Countries will likewise be managed responsibly.

Map depicting the three regional Commissions. The functions of the Commissions include providing a forum for consultation and cooperation (including the establishment of regulatory measures), as well as exchanging regional information.

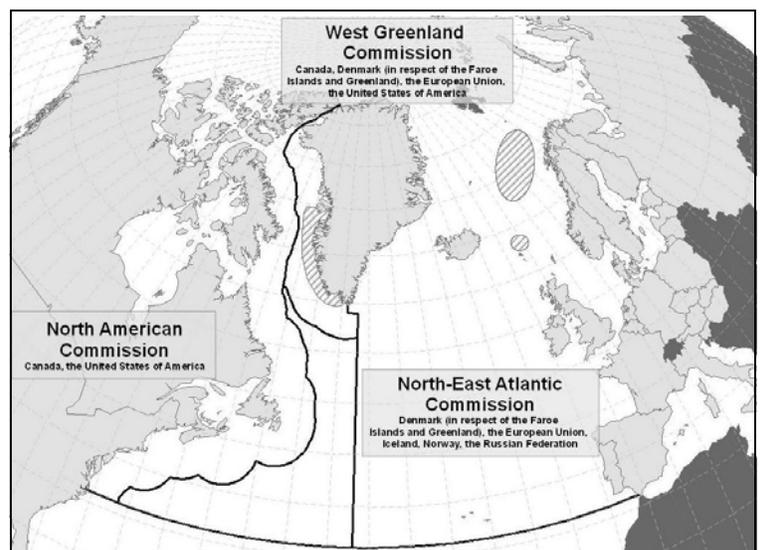
Quick Fact 1: NASCO is composed of a Council, three regional Commissions and a Secretariat. In addition to the Parties identified on the previous page, more than 30 non-governmental organizations (NGOs) have observer status.

Quick Fact 2: Each year, NASCO seeks scientific advice from ICES (the International Council for the Exploration of the Sea) related to the status of Atlantic salmon stocks, the effectiveness of management measures, monitoring and data needs, and catch options. NASCO uses this scientific advice to make management decisions.

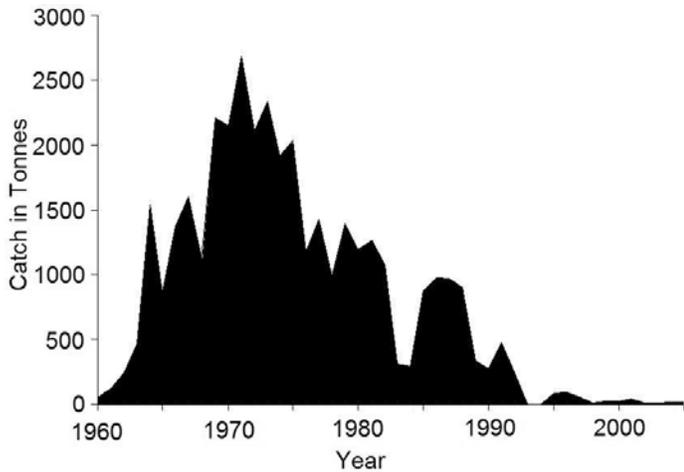


When proposing regulatory measures, the West Greenland and North-East Atlantic Commissions take into account the interests of communities which are particularly dependent on salmon fisheries. In practice, taking this obligation into account has been met through the provision of reserve quotas and allowance for an *internal use only fishery* (i.e. no commercial export) in years when ICES's scientific advice advises against *any* fishery.

For more information about ICES and its salmon work group, please visit www.ices.dk/



West Greenland's Harvest: A sampling platform



Since 1982, an international team of samplers have been deployed throughout Greenland to obtain samples from fish processing plants (when a commercial fishery was allowed), local markets and other venues from individual ports where salmon are caught. In recent years, an internal use only fishery that harvests <20 tonnes (~ 44,000 pounds) has existed in West Greenland. Under NASCO's West Greenland Sampling Agreement, parties to the West Greenland Commission cooperate in a program to sample adult salmon harvested by Greenland fishermen. The data collected during this annual effort is used by ICES's Working Group on North Atlantic Salmon to provide catch advice to NASCO.

The following information about every specimen is recorded: location of catch, length and weight and any internal or external marks or tags. Scales are collected for ageing and tissue samples for use in genetic determination of origin (continent and sub-continent).

Additionally, the following biological samples are collected from a portion (<150) of the sampled adults:

- kidney samples* (for testing of presence/absence of Infectious Salmon Anemia Virus)
- stomachs* (contents are examined and provide diet-related information)
- otoliths* (collected and archived for age and growth rate information).



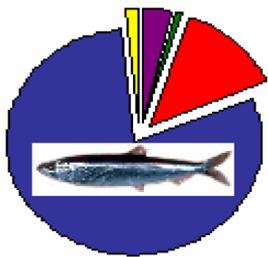
A tissue sample is taken from the adipose fin of this adult for DNA testing.



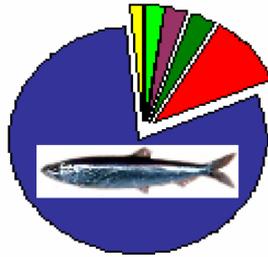
Injuries, such as predator bites on this adult's caudal peduncle are noted.



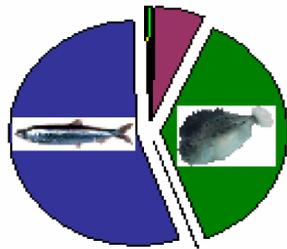
A fluorescent green Visual Implant Elastomer (VIE) tag is just visible behind this adult's eye. Tagged fish that are recaptured in Greenland's fishery provide valuable origin-related information



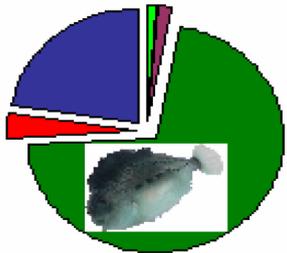
Upper Bay



Middle Bay

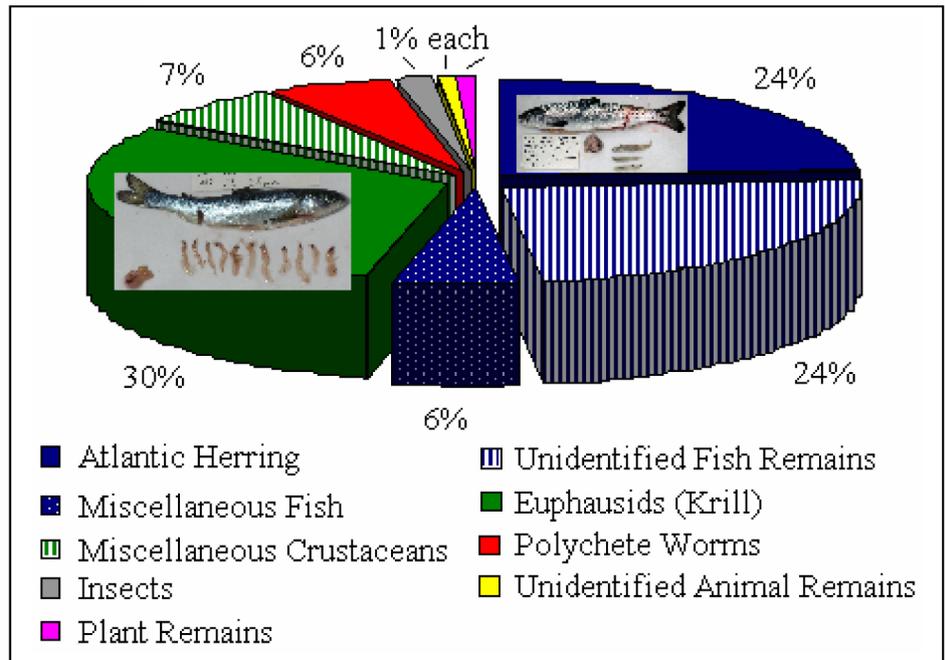


Inner Outer Bay



Outer Outer Bay

- Atlantic Mackerel
- Atlantic Herring
- Alewife
- Lumpfish
- Blueback Herring
- Other



The contents of the stomachs extracted from Atlantic salmon postsmolts captured from 2001-2005 reveal that Atlantic herring and krill are the major prey items of Atlantic salmon in Penobscot Bay. Unidentified fish remains are most likely those of Atlantic herring, whereas miscellaneous fish include wrymouth, rock gunnel, radiated shanny, searaven and sculpin species. Miscellaneous crustaceans include amphipods, copepods and isopods.

Data collected during the PST are used to guide future sampling efforts and to help scientists and managers better understand the factors influencing Penobscot River Atlantic salmon dynamics.

Although there is no simple answer to why adult Atlantic salmon return rates continue to decline, PST data may help to contribute to a better understanding of postsmolt ecology and current restoration stocking strategies. The PST continues to be part of a larger, ongoing NEST endeavor to improve understanding related to Atlantic salmon, especially during the critical time at which they transition from freshwater into marine environments.

Non-target species composition (by weight) of PST tows from 2003 – 2005 reveals that Atlantic herring are the dominant species in the Upper and Middle Bay Areas, and lumpfish are the dominant fish species in the offshore Outer Bay Areas. Other species include American shad, striped bass, sea lamprey, rainbow smelt, Atlantic tomcod, capelin, Atlantic silversides, threespined stickleback, hake species, and butterfish.

The Northeast Salmon Team (NEST) operates within the Northeast Region of NOAA Fisheries Service to promote the recovery and future sustainability of Atlantic salmon.

We are composed of fisheries managers and scientists jointly based out of the Orono, Maine Field Station; scientists based out of the Woods Hole, Massachusetts Northeast Fisheries Science Center (NEFSC) and Narragansett, Rhode Island Laboratory; and managers based out of the Gloucester, Massachusetts Northeast Regional Office (NERO).

Please visit our website at <http://www.nefsc.noaa.gov/salmon/>

