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.

Canada

Denmark (in respect of Greenland & Faroese)

European Union

Iceland

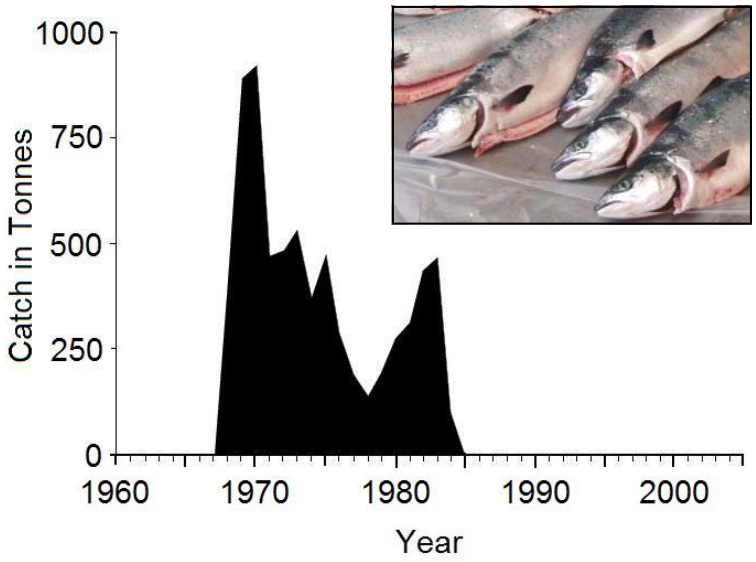
Norway

Russian Federation

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.

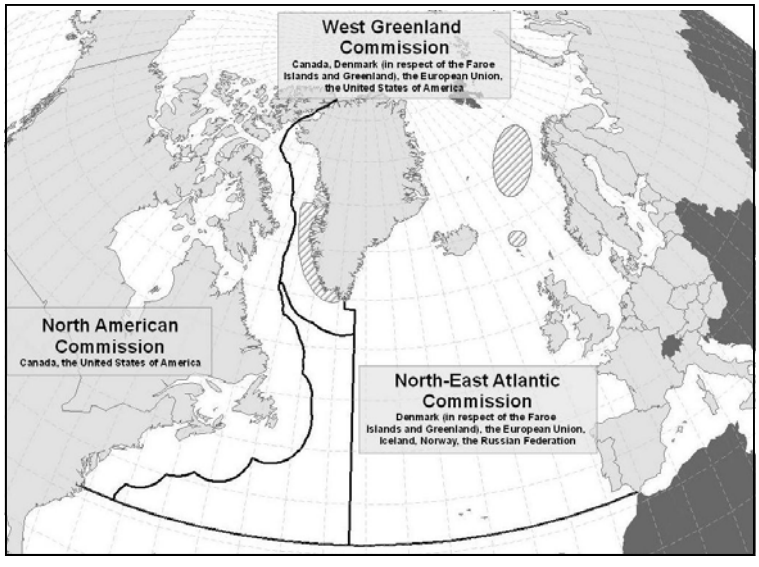
Quick Fact 1: NASCO is composed of a Council, three regional Commissions and a Secretariat. In addition to the Parties identified on the previous page, more than 30 non-governmental organizations (NGOs) have observer status.

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.

ICESCIEM
International Council for the Exploration of the Sea
Conseil International pour l'Exploration de la Mer

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.

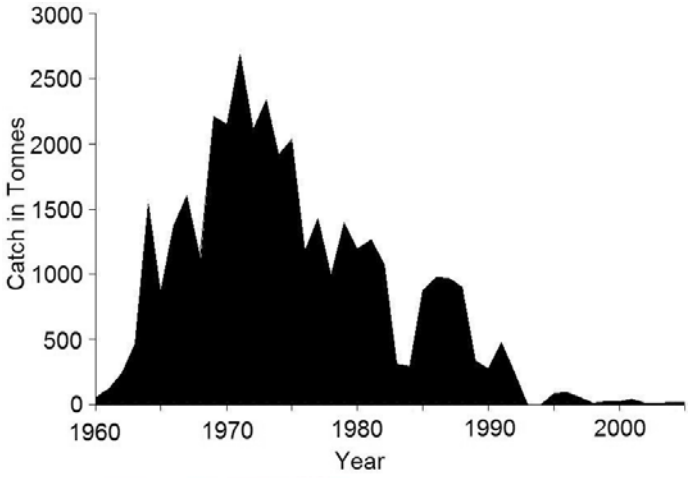
For more information about ICES and its salmon work group, please visit www.ices.dk/



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.

West Greenland's Harvest: A sampling platform

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 subcontinent).

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.

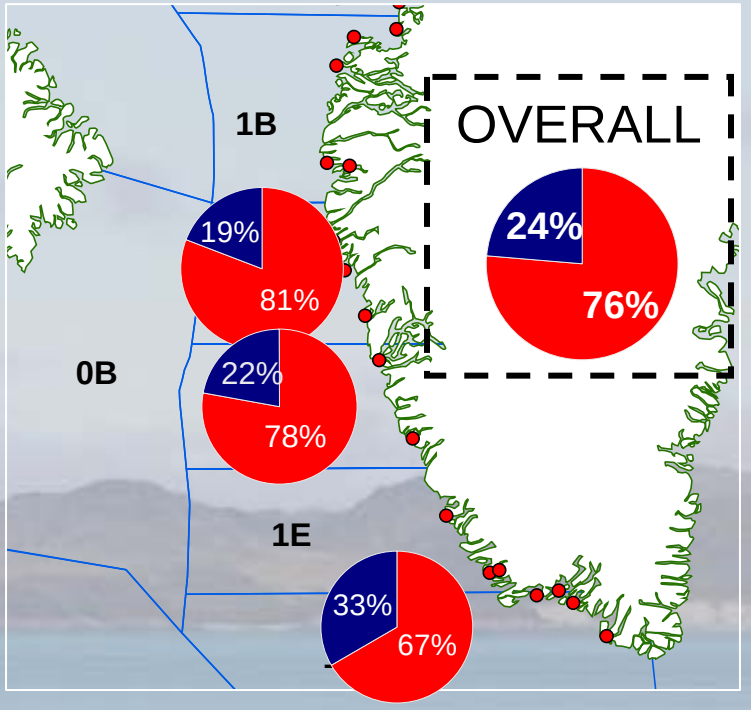
A fluorescent green Visual Implant Elastomer (VIE) tag is just visible behind this adult's eye. Tagged fish that are recaptured in Greenland's fishery provide valuable origin-related information

Examining a sample of West Greenland's Atlantic salmon harvest enables fishery managers to collect valuable information about adult Atlantic salmon at sea that would otherwise be difficult and costly to collect. The continent of origin (COO) information obtained through DNA analyses provides one piece of the puzzle that helps scientists determine the status of the different stock complexes that mix at sea. COO estimations, in combination with the other information gleaned from the cooperative sampling efforts, are essential for assessing the impact that this mixed stock fishery has on the two stock complexes (North American and European), setting catch quotas and managing this international treasure.

Homewater fisheries, as well as distant water fisheries around Greenland, the Faroe Islands and the Northern Norwegian Sea have been drastically reduced, representing major sacrifices for communities dependent on marine resources. As such, the weak response from the Atlantic salmon stocks to such drastic management measures has been met with significant disappointment.

The continued decline of Atlantic salmon has been largely attributed to high mortality at sea. Insights into factors driving marine mortality will be critical to our ability to rationally manage salmon stocks throughout their range in the future through participation in such initiatives as The Salmon at Sea Program (SALSEA) that centers on focused international collaboration to unravel the mysteries of salmon at sea (www.nasco.int/sas/salsea.htm).

The fact that saving salmon requires more than reducing or eliminating exploitation suggests that adoption of a broad-based, holistic approach to management that encompasses the variety of threats Atlantic salmon encounter throughout their life history is essential. NASCO and its Parties have formally recognized that the foundation of good decision-making centers on sound science and consideration of all alternatives and their associated risks, and thus have adopted the Precautionary Approach.



Map depicting what percentage of the Atlantic salmon sampled along West Greenland's coast are of North American origin (in red) and European origin (in blue). The blue lines denote the statistical divisions as outlined by the Northwest Atlantic Fisheries Organization Convention. The data used to create this figure is from the 2006 internal use only fishery.

It is clear that there is no single solution to the problem of declining stocks. It is also clear that salmon recovery will take much longer than anticipated and requires adoption and implementation of the Precautionary Approach, as well as aggressive action on a number of threats to the species and its habitat.

Quick fact 3: The **Precautionary Approach** requires, among other things: consideration of the needs of future generations, avoidance of irreversible changes, articulation/understanding of and preparedness for consequences/risks of alternative choices, conserving the productive capacity of the resource where the likely impact of resource use is uncertain, and appropriately placing the burden of proof.

The NOAA's National Marine Fisheries Service (NMFS) Northeast Salmon Team (NEST) is comprised of managers from the Northeast Regional Office (NER) and scientists from the Northeast Fisheries Science Center (NEC). The NER administers NOAA's programs in the Northeastern United States to manage living marine resources for optimum use. The NEC is the research arm of NOAA Fisheries in the region and plans, develops, and manages a multidisciplinary program of basic and applied research. More Atlantic salmon information is available at www.nefsc.noaa.gov/salmon/.