

Challenges and opportunities in managing the Atlantic salmon - the international aspects

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Summary

The Atlantic salmon is one of a small group of fish with its own international Convention dedicated to its conservation, restoration, enhancement and rational management. The Convention led to the establishment in 1984 of the intergovernmental North Atlantic Salmon Conservation Organization (NASCO).

Information provided by the International Council for the Exploration of the Sea (ICES) indicates that the abundance of salmon in the North Atlantic prior to any fisheries (pre-fishery abundance or PFA) has declined from approximately 8 million fish in the early 1980s to around 3 million fish in recent years. During this period there has been a declining trend in marine survival and, despite significant fishery reductions, factors acting on survival in the first and second years at sea are constraining the abundance of Atlantic salmon. Fishery reductions mean that the decline in returns has been less marked than the decline in PFA but still a concern and in some situations, particularly southern parts of the range, salmon stocks have been lost or are endangered. There have also been reductions in the condition of returning salmon and increased incidence of repeat spawning in some areas.

Regulatory measures established by NASCO have significantly reduced the harvest of salmon in distant-water fisheries from a five-year average of 2,000 tonnes immediately prior to NASCO's establishment to 41 tonnes in the most recent five-year period. Since 2000, there has been no salmon fishery around the Faroe Islands and only a small research fishery from 1991 – 1999. There has been an internal-use only fishery (20 - 58 tonnes) at West Greenland since 1998 and new internationally agreed measures are being implemented to improve monitoring and control in this fishery. Combined harvests in these distant-water fisheries have declined from ~30% of the total North Atlantic catch to less than 2% in recent years and represent major sacrifices for communities dependent on salmon and other marine resources. Consistent with the Convention, Greenland and the Faroe Islands seek fairness and balance in the management of fisheries and there is, therefore, pressure on States of origin to implement conservation measures. There have been major reductions in fishing effort all around the North Atlantic, particularly in coastal fisheries, an increasing proportion of the catch is now taken in estuarine (9%) and fresh (60%) waters and there is increasing use of catch and release in recreational fisheries (>135,000 salmon in 2014).

Despite these measures, many stocks remain below or well below their conservation limits and in these circumstances stock rebuilding programmes should be developed. While the first response to declining salmon abundance is often to reduce exploitation, efforts to rebuild salmon stocks require a broad focus. Progress in implementing international agreements relating to management of fisheries, habitat protection and restoration, and aquaculture and related activities are now subject to critical evaluation through NASCO.

NASCO's International Atlantic Salmon Research Board (IASRB) developed and supported the implementation of a major, innovative, programme of research, the *SALSEA* Programme, to improve understanding of the distribution and migration of salmon at sea and the factors influencing mortality of salmon at sea. New tools are now available in support of management (e.g. migration models, genetic baselines and genetic assignment protocols). New insights into the potential overlap of salmon and large-scale marine fisheries for pelagic species in the North-East Atlantic were obtained. ICES has advised that current bycatch estimates are highly uncertain and that increased efforts are needed to obtain reliable estimates and NASCO is liaising with ICES, the North-East Atlantic Fisheries Commission (NEAFC) and the Northwest Atlantic Fisheries Organization (NAFO) on this issue.

The conclusion from the *SALSEA* Programme was that increased marine mortality linked to warming environments poses significant challenges and uncertainties for management. Since management options in the ocean are limited, the goal should be to maximise the number of healthy, wild smolts that go to sea by focusing actions on impact factors in fresh, estuarine and coastal waters. Fisheries should be managed to exploit only the harvestable surplus. Mixed-stock-fisheries pose particular challenges for management in ensuring protection of the weakest contributing stocks. Challenges remain to be addressed in managing impacts of aquaculture, and while there is increasing interest in stocking in response to low abundance, the risks and benefits need to be carefully considered. A new international telemetry programme being developed by the IASRB offers opportunities to estimate mortality at different stages along the salmon's migration route and to identify mortality factors.

Continuing low abundance and warming environments pose challenges both to the salmon and those charged with their management and reinforce the need for international cooperation to conserve and restore this iconic species for future generations. While there are no quick fix solutions, new information, approaches and tools can assist managers. The measures adopted internationally should give those working to rebuild salmon stocks confidence that actions taken domestically are not being undermined by actions elsewhere.