Factors Affecting Atlantic Salmon at Sea

Ken Whelan,
Research Director,
Atlantic Salmon Trust
www.atlanticsalmontrust.org

For the past two decades scientists have become increasingly worried that for some stocks of salmon, survival has plummeted. In the 1960s and 70s the number of adult Atlantic salmon at sea was in the region of 8 million to10 million fish. In more recent years this number has reduced to 3 million. The abundance of salmon mustering at sea (so called pre-fishery abundance levels), prior to their arrival in freshwater, has dropped by 66% in the case of southern European grilse and by a staggering 81% for the larger, multi-sea winter salmon. The drivers of this decline are complex and regardless of efforts made to reduce harvest levels by nets and rods, to enhance habitat and to protect the salmon's freshwater environment, return rates from the ocean have stayed stubbornly low.

To appreciate why there is currently such widespread concern regarding salmon survival at sea we must look back to the 70's and early 80's, when 20% or more of smolts were returning as grilse. Studies on an Irish salmon stock indicated that growth in the first year at sea was high during 1963 to 1981 and generally poor after this period, particularly in recent years. This poor growth was correlated with low marine survival estimates for this stock. Lately,survival rates have struggled to reach 8% and at times have dipped to 5%. Losing 95% of a river's output at sea is unprecedented and indicates ocean-wide changes which are impairing the smolts' ability to feed and grow at sea.
This has happened despite the fact that catches of salmon have been greatly curtailed, dropping from around 12,000 tonnes in the 60s to their current levels of a little over 1,000 tonnes.

Over the latter half of the last century the north-east Atlantic slowly shifted to a warmer regime. Warmer surface waters have resulted in marked changes in the composition and production of plankton. The distribution of the shrimp-like creatures which form the plankton communities in the surface layers of our neighbouring seas is altering at a significant rate. Species adapted to the colder waters, in which salmon smolts thrive, are moving north and new, exotic forms from the south now inhabit those vacated ecological niches.

Research has clearly shown that different areas of the ocean are behaving in very different ways. Doubtless similar changes have happened before and what we are witnessing is part of the continuum which has shaped our oceans over the millennia. The role that man has played in accelerating or altering such changes is hotly debated but what is clear is that our salmon are facing an uncertain future. Salmon scientists must link more closely with their marine science colleagues to ensure that the salmon is universally accepted as a legitimate member of the pelagic family of fishes. In my view we must also argue strongly that those funded to study the changing oceans and particularly the impact of such changes on the pelagic ecosystem, are charged with monitoring the welfare of our salmon stocks at sea. We must move away from studying the survivors reaching freshwater to an all-embracing vision of salmon populations which encompasses survival corridors stretching from the most remote spawning burn to the limits of the salmon's migration pathways.