

## *Chairman's Summary*

### **Introduction and Scene Setting**

*Malcolm Windsor*

The symposium started with the big picture, fishing down the web, the expansion of fisheries towards the poles, rich countries still having fish by importing but virtually all fisheries need to rebuild. A future of more local and smaller scale fisheries was suggested, and salmon fisheries fit this scenario. Far from lessening the pressure on wild fish, the farming of carnivorous fish such as salmon increases the pressure and has the potential to stifle the required renewal and long term sustainability of other stocks. Exploitation rates in salmon fisheries can be very high. Although salmon stocks are an insignificant part of ecosystem, the species is an iconic one which gives weight to our work on the species.

There followed an overview of the status of Atlantic salmon – over 2,000 rivers produce up to 10 million adults each year, but sea survival is low and has been declining for the last 30 years. Abundance has fallen more for MSW fish particularly in southern areas. Common patterns suggest unspecified but broad scale factors acting throughout the salmon's time at sea. River-specific stock assessments, while not glamorous, are the true foundation that supports all research to explore hypotheses about factors that affect abundance.

The Baltic salmon which, although the same species as Atlantic salmon are geographically isolated and do not enter the Atlantic Ocean, is also suffering increased mortality at sea. The conclusions were that:

- The post-smolt survival of wild and hatchery-reared salmon in the Baltic Sea has declined since the 1990s
- this declining trend in survival can be explained by the increased number of a predator species (grey seal) in the Baltic Sea
- the annual variation in post-smolt survival coincides with variation in recruitment of a the main prey species of salmon in the northern Baltic (young-of-the-year herring)
- it remains uncertain whether the observed correlations arise from direct causalities or from other mechanisms

The salmon in the North Pacific was the next subject giving us a wider perspective into what is happening to the larger Pacific salmon stocks. Production in recent years has been at near record highs. Pink salmon and chum production is particularly high. Hatchery production had replaced natural runs in Japan although much of the salmon production in the other North Pacific countries is still from natural runs. A ten-year research project called BASIS, a SALSEA type programme, had coincided with five years of warm ocean followed by five years of cold ocean which offered a unique opportunity to study changes in zoo-plankton and the bio-energetics of juvenile fish surviving cold conditions at high latitude.

The oceanographic conditions in the North Atlantic, was the next topic. These conditions are determined by the atmosphere and three inter-linked circulation systems. These systems change and since the mid-1990s the relative strengths have altered but difficulties in modeling make projections rather uncertain. There did seem, however, to be a step change in the mid to late 1990s.

The processes behind the correlation between declining North Atlantic salmon and increasing Northern Hemisphere temperature offered an insight into the process behind the correlation between declining salmon stocks and increasing temperatures and the link was with Sea Surface Temperature (SST). There is a progressively northerly bio-geographic drift of warm water plankton and fish and step changes in that the major prey species of the salmon had moved north. This had happened before, while the planet was emerging from the last Ice Age, but it was a significant change in the salmon's environment.

Unraveling the life of the Atlantic salmon at sea has been the theme of the SALSEA Project and we traced the evolution of the benefits of sharing facilities and expertise. The project was showing major genetic advances and new data-bases created had taught us a lot more about the salmon as a pelagic marine species.

This first session was an excellent start but was designed to be 'scene-setting' rather than introducing the new information and ideas that are emerging from SALSEA.