Atlantic Salmon at Sea – The Climate Change Forecaster

Oireachtas Joint Committee on Environment and Climate Action, 11th May 2021

Opening Statement

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1.

Firstly may I thank the Committee for your invitation to make a submission on the subject of Atlantic salmon as an indicator of ocean related climate change.

2.

Atlantic salmon are regarded as a keystone species and play a unique and crucial role in our aquatic ecosystems. A superb biological indicator, their migration pathways traverse lakes, rivers, estuaries and the high seas. Tracking the movements and overall welfare of salmon stocks across these distinct biotopes can tell us a great deal about the health of our oceans and our freshwater resources. As they migrate across these zones or domains, the salmon absorbs into its body chemical and biological clues as to the overall state of our oceans and our freshwater systems.

3.

Wild salmon, in their migrations across the oceans, are one of the natural world's most sensitive indicators of the biological and chemical effects of climate change. Research has shown quite clearly that aquatic systems are changing and changing fast. Water is getting warmer, storms are getting stronger and the availability of food resources in and from the ocean is under increasing pressure. Oceans and atmosphere are intimately and inextricably linked. Changes in the oceans are "forcing" unprecedented shifts in climate patterns.

4.

Similar patterns are apparent in freshwater, where we are witnessing unprecedented rainfall events / deluges which have caused massive landslides and the dislocation of tonnes of mud, silt and peat. Recently in Ireland (2018) we have also witnessed an intense drought and unprecedented increases in summer water temperatures. The impacts of severe droughts on juvenile and adult salmon may well be far more serious than the more dramatic flood events.

5.

Such climate perturbations are also causing major biological modifications including the appearance of new fish and other animal species off our coast and the spread of non-native, invasive species around the coast and in freshwater. Atlantic salmon is an ideal bio-monitor to track and trace climate change from remote mountain streams to distant zones in the Artic seas. The salmon, which is equally at home in both fresh and salt water, traverses large areas of the planet in a relatively short space of time but is endowed with an uncanny ability to find its way home. Throughout its odyssey the salmon collects and stores a wide range of physical, chemical and biological information.

6.

Although the science surrounding the biology of salmon and other diadromous species is complex the take home message is clear: adaptation to climate change is in our hands. Combating climate change requires a clear and unambiguous focus on monitoring change, responding quickly to change, conserving biodiversity and relieving manmade stresses on the environment.

7.

Salmon divided into the Atlantic and the Pacific forms more than 20 million years ago. They have faced huge changes on many occasion over the millennia and have shown their ability to adapt to these changes. Such biological adaptation needs time and space. Mitigation implies doing a minimum in order for a particular species to survive. Adaptation gives the species time and space to recover and thrive.

8.

A large salmon, returning to our rivers in spring, takes on average 5 years to reach maturity – including two full winters at sea. Each decade therefore only provides two full cycles of spring salmon. Genetic and biological adaptation to warmer oceans and higher freshwater temperatures will take a long time. Faced with increasingly warmer oceans salmon may not find it possible to adapt fast enough to the areas they now inhabit and will invariably seek out colder waters. Over the coming decades they may seek out and flourish in the more northerly zones, which are currently too cold and inhospitable for them to live successfully.

9.

If we wish to retain and increase the numbers of salmon in Ireland we need to provide the fish with the marine and freshwater environments in which they can adapt and thrive – cold, clean water is fundamental to the salmon's survival.

10.

Currently, management is focused, correctly, on salmon conservation and protection. Have we the ability to move fast enough to take advantage any improvements in environmental conditions in our rivers and our oceans and to implement stock rebuilding programmes? Have we the systems in place to monitor and forewarn us of these changes and are we prepared to move quickly in adapting to the many and varied changes which a changing climate may bring?

11.

There is an ever increasing, urgent need to establish refugia or strongholds for the very best genetic stocks and the most resilient salmon stocks. Adaptation strategies require determined and coordinated efforts to reduce, mitigate and eliminate pressure on wild stocks of salmon. This will ensure that the core stock of juvenile fish is available to take advantage of the full suite of adaptation strategies.

12.

With over sixty years of detailed monitoring data from the Marine Institute's Newport facility in County Mayo and a wide range of ocean data from the Marine Institute's off shore

monitoring programmes, Ireland is ideally placed to directly monitor and advise on climate change events and likely climate change impacts. Geographically the seas around the island of Ireland are ideally placed to study these changes, located as we are between the cold seas to the north and the far warmer oceans to the south.
