Environment, Climate Change and Land Reform Committee

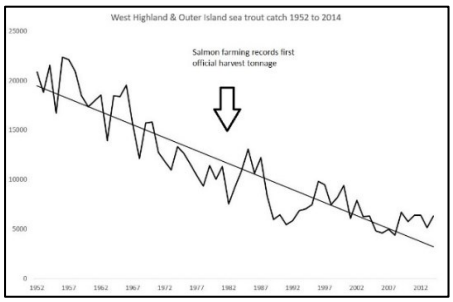
Environmental impacts of salmon farming

Written submission from Dr Martin Jaffa, Callander McDowell

Note from the Clerk: All evidence must comply with the Scottish Parliament's policy on the treatment of written evidence. The author has agreed to cover some sections of his submission.

Although the salmon farming industry has operated along Scotland's west coast for over forty years, it would appear that no evidence has been submitted of any environmental damage caused by the salmon farming industry over this time. It is all hypothetical. The west coast remains a very diverse environment.

[redacted]the SAMS report provided solid proof of the damage done to populations of wild fish. The section on 'sea lice effects on wild salmon populations' (page 12) the wording includes: 'potential for', 'predicted' and 'estimated' but no data.[redacted]



The graph shows the numbers of sea trout caught by rod and line since 1952 within the west coast 'aquaculture zone'; the area where all Scottish salmon farms are located. The raw data has been collected by Marine Scotland Science and has been collated into the graph without any manipulation. The graph shows a clear decline in the number of sea trout caught since 1952. The graph also includes an arrow showing the date of the first recognisable harvest of farmed salmon. Prior to then, the amount of salmon produced was negligible. The question the committee should ask is if sea lice from salmon farms are to blame for the decline in wild fish populations, then what was the cause of the decline from 1952 to 1982, when there was no salmon farming. Could it be that whatever caused the decline from 1952 to 1982 is also responsible for the continuation of the decline after 1982? It should be noted that in recent years, the rate of decline appears to have slowed, despite the growth of the salmon farming industry.

I have tried to discuss this data with Marine Scotland Science, Salmon & Trout Conservation, Fisheries Management Scotland and NASCO but there has been a general reluctance to meet me.

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[redacted] On page 12, the reports states that ‘a clear relationship exists between the increased abundance of sea lice due to salmon farming and the presence of wild hosts in the sea has been demonstrated outwith Scotland’. The review then lists a number of references, the first of which was published by Shona Marshall in 2003. Dr Marshall’s work relates to an investigation in Loch Laxford which is very much in Scotland. [redacted]

Page 11 of the review states that ‘for smolts and post-smolts, both laboratory studies indicate that eleven or more pre-adult and adult stage lice per fish will cause mortality’. The specific paper by Wells et al, 2006 is titled ‘Physiological effects of simultaneous, abrupt sea water entry and sea lice infestation of wild, sea run, brown trout’. In my experience wild sea trout do not make an abrupt entry to sea water. They make gradual progress from freshwater to sea. Such abrupt changes would cause immense stress to the fish and make them extremely likely to die, regardless of the presence of sea lice. It is not surprising the laboratory fish died.

I was surprised to see that the review made no mention of the over-dispersion of sea lice in the wild, a key feature of sea lice infestations. This recorded observation means that a few wild fish carry very large numbers of lice. This is probably because weaker fish, that are likely to die anyway are less able to combat sea lice infestation. This over-dispersed spread of sea lice can affect the interpretation of wild fish population studies. Much of the work on over-dispersion was carried out in Scotland by the Department of Agriculture and Fisheries for Scotland, now Marine Scotland. (Fisheries Research Services Internal Report No 12/06 - A REVIEW OF RESEARCH AND FIELD DATA ON RELATIVE LOUSE INFECTION LEVELS ON WILD SALMON SMOLTS AND SEA TROUT AND THE PROXIMITY OF FISH FARMS TO RIVER ESTUARIES Carey Cunningham April 2006)

The issue of sea lice is extremely contentious because the sports fisheries sector has blamed salmon farming for the decline in wild fish populations for many years. A more detailed account can be found in a new book – Loch Maree’s Missing Sea Trout (Amazon). [redacted]

The committee also made reference to the issue of escaped farms salmon. No salmon farmer wants to see any fish escape because it represents a commercial loss. However, it is likely that the impact of escaped farmed salmon is overstated. Firstly, the wild population does not consist of pure strains. This is the result of 150 years of exploitation by rods and line in which fish have been unselectively removed from rivers impacting on the overall gene pool. In addition, some rivers have been restocked using fish from different rivers and in some cases from farmed source. [redacted]

The SAMS review details examples of negative traits that farmed salmon bring to wild salmon populations when fish escape, however, this ignores Darwinism evolution of survival of the fittest. Any trait that does not benefit the resulting progeny of any interactions between wild and farmed escaped fish are unlikely to survive. In addition, farmed salmon are still effectively a wild fish. They are not the result of thousands of years of selective breeding as with most domesticated farm animals. Any interbreeding with wild salmon clearly demonstrates that the fish are still effectively wild animals.

The committee asked for mortality comparisons with other industries. This is misleading given that fish are cold blooded and have a different reproduction strategy to terrestrial warm-blooded farm animals. A better comparison would be with wild fish where about 99% of the fish die before completing their life-cycle. This is why, adult fish produce hundreds if not thousands of eggs.

This also relates to the question of recent increased level of mortalities as highlighted by the committee. In my opinion, the underlying problem has been the widespread coverage in the press of negative stories about the salmon farming industry. This reached a peak in 2017 with breaking stories almost every week. This adverse publicity encouraged farming companies to try to minimise problems such as sea lice by rapidly introducing new technology untried in Scotland. Unfortunately, the introduction of new technology has been a case of trial and error and combined with other issues has contributed to much higher mortality that would be expected.

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[redacted] It is worth reminding the committee that there are many billions of fish living in the world's seas and oceans all of which defecate in the sea. This is part of the natural ecology of the marine environment including recycling the flow of nutrients, without which marine life would not exist. Farms do concentrate waste in a small area but as [redacted] highlights, most farms are the size of a football pitch. I believe that the SSPO say all the farms in Scotland would currently fit in the area covered by two 18-hole golf courses. Space does not allow to include a google map of Inverness Caledonian Thistle Football ground compared to the Moray Firth, against which it abuts. A farm that size disappears into insignificance against the local seas.

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It is easy to get sucked into criticism of salmon farming. I would hope that before any conclusion are reached that all committee members have at least visited a salmon farm and seen the issues for themselves rather than rely on claims made by those pursuing their own agenda.