

NORWAY NOW: SCOTLAND'S FUTURE?

Manfred Raguse reveals the influence of fish farming over human health and scientific research in Norway. His findings echo many problems we know about in Scotland – and some perhaps we don't

IN 2013 THE Norwegian government introduced the so-called "quality standard for wild salmon". After the Norwegian Institute for Nature Research (NINA) collected genetic samples all around the country, the scientists came to a shocking conclusion and a sobering factual situation: of 104 wild salmon stocks, 81 are not fulfilling the quality standard, which requires that salmon are not genetically influenced by escaped farmed salmon, that rivers have a sufficient stock that can spawn in the river, and that there is a surplus of salmon which can be harvested. Only 23 Norwegian stocks can be described as "good" or "very good" and only 36 stocks have not been genetically affected by farmed salmon.

In other words, we have reached a point where there are hybrids between wild and farmed salmon in almost two thirds of Norwegian rivers. This means the very existence of unique wild stocks, present in Norway since the last ice age, is threatened. The escaped farmed salmon spawn with wild salmon and cause a "genetic contamination" resulting in the loss of inherited survival qualities developed over thousands of years.

The Norwegian salmon farm industry has so far successfully resisted calls to mark their farmed salmon. In the case of huge escapes, which happen often, it is almost impossible to find out where the "tame" or escapee salmon are coming from and therefore it's impossible to take proceedings against the companies.

According to NINA, 450,000 wild salmon enter



MANFRED RAGUSE is the founder of the Norwegian Flyfishers Club, a board member of NASF Germany and has been involved in salmon conservation for more than 40 years

Norwegian rivers every year. On the other hand, the Norwegian Marine Research Institute estimates the number of escaped farmed salmon is 1.5 million per year. On top of this, only 20 per cent of the escapes are reported. Many companies are trying to cover up the huge escapes of farmed salmon so they can't be held responsible.

Today, in Norway and in Scotland, it is widely known that salmon farms are breeding grounds for deadly sea-lice. The extremely high numbers of farmed salmon in the sea pens act as hosts for lice and cause an unnatural and significant increase in their population. The parasites attach themselves to migrating wild smolts, which are unable to survive. What is less well known is that the farms produce lots of excrement and deadly fish diseases. The farms are pumping millions of tons of cloaca (fish sewage) per year into the formerly unpolluted fjords without – like other industrial polluters – being asked to pay for it.

The range of diseases in the salmon farms is long and experts estimate that 50 million salmon die each

year. These diseases can be transferred to wild salmon. The salmon farms are fighting these diseases with medicine. Some five to ten per cent of the medicated feed gets through the meshes of the cage into the fjord and large quantities of wild fish feed on it. These fish are then contaminated with medicines that may be unsuitable for human consumption.

Widely used feeding mixtures for farmed salmon contain a chemical preservative called Ethoxyquin. Scientists report that it congregates in the human body and is transferred by mothers to their breast-feeding babies – it can be genetically



Lice have eaten this salmon down to its skull.



An escaped farmed salmon. Two thirds of Norwegian rivers have wild-farmed hybrids.

harmful. While it is forbidden within EU countries to use Ethoxyquin in food, it is paradoxically not restricted if used as fish food.

In addition to food additives, which should reduce sea-lice, huge chemical treatment baths are used. This often involves the use of illegal chemicals or prohibited chemical cocktails. It is common practice that, after the treatment of the salmon, the chemical cocktails are simply thrown into the sea, a legislative gap that seems to be a low priority for the Norwegian government. Eight Norwegian organisations are currently trying to impose a ban on the practice. The consumption of medicines and chemicals to control sea-lice in the salmon farms is increasing steeply.

In 2014, some 32,000 tons of hydrogen peroxide, also used against sea-lice, were dumped into the fjords. Teflubenzuron and diflubenzuron, too. These chemicals are chitin synthesis inhibitors and prevent sea-lice from forming a new shell when they are moulting. The problem is that these substances affect all crustaceans – the consequences for shrimps, crabs, lobsters and other crustaceans are devastating.

In contrast to other industries, where the causative principle is used and where effective sanctions are applied against environmental injuries, the influence of the salmon industry appears to be so significant that rules seem not to apply to it.

The plan is to multiply commercial salmon production, despite the fact that it is already out of control.

The state inspection agency, Riksrevisjonen, concluded in 2012 that the "environmental pollution caused by the salmon farms has become so comprehensive that it can't be called 'a growth in harmony with the nature'", which the Norwegian government

required originally. Unfortunately, this important conclusion has not led to any consequences. The state food supervisor, Mattilsynet, which has responsibility for monitoring and controlling the salmon industry, is unable to fulfil this task in an effective manner.

In the last few years, some of the most important functionaries, including the fisheries minister, have changed often, and are intertwined with the salmon farms, professionally and privately, and some of them have larger shareholdings in the industry. The powerful salmon industry strongly influences politics, administration and research. The industry is giving research assignments to scientists and is publishing results that are favourable for the salmon farm industry. Negative results are filtered. This is possible because many research institutes are chronically underfunded and require research funding from the salmon industry. Since these "research funds" seem to be linked with special conditions, expectations or targets, the independence of



Lice-covered Norwegian sea-trout. An image the public rarely sees.

these results must be questioned. The problem is that those scientists who supply unpleasant research results seem to receive very few new job offers. Unfortunately, this is increasingly true even for publicly financed research.

The financial resources of the salmon industry enable them to employ highly active lobbyists and lawyers who represent their interests in all public processes and discussions and give the public a positive picture of the industry. The Norwegian government does not require strong environmentally compatible practices from the salmon industry. The situation will not get better, although environmentally friendly production on land or in closed systems is possible. It is most unlikely that enough

influential politicians will promote sustainable production of salmon in closed systems within a reasonable time.

Therefore, it seems the only way to go for salmon conservationists is the large-scale education of consumers, to inform them

about the health risks associated with the consumption of industrially produced salmon – eaten by millions of people on private tables and in company canteens every week – and to point out the associated environmental impact.

A noticeable decline in demand for cheap industrial salmon and a stimulation of the demand for sustainably produced farmed fish would help the "alternative salmon farm industry", which produces fish in closed systems and/or on land and without breeding sea-lice and affecting the environment like conventional salmon farms. This alternative already exists and will grow fast with increasing demand from consumers who are fed up with unsustainable mass-produced salmon.

I'm hoping that the giants of the salmon farm industry will not want to miss these "marked shares" and will invest, step by step, in truly sustainable production. This could cause a trend that has a positive effect on wild salmon populations. **TRF**



Chemicals used by farms kill crustaceans. Aquaculture funding dominates scientific research, but negative findings are "filtered".