Red skin disease in Atlantic salmon

Background and frequently asked questions

Background

During 2019 and 2020, Fisheries Management Scotland and members and the Marine Scotland Science (MSS) Fish Health Inspectorate received reports of Atlantic salmon showing what has been termed 'red skin disease'(RSD).

Whilst reports of these fish have generally been widespread across Scotland, some rivers have had little or no affected fish and other neighbouring rivers with numerous fish showing signs.

In both 2019 and 2020, reports were first received in late May with most reports occurring in June and July. Data indicate the vast majority of affected fish are multi-sea-winter salmon but notable occurrences have also been observed in one-sea-winter stocks. A small number of sea trout were also recorded with skin damage.

Image: Marine Scotland Science

Image: Reuben Sweeting

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Reports of fish with RSD have also been received from across northern Europe including Ireland and Norway. The disease is particularly apparent on fresh run salmon and the signs can include red rash on the skin, ulcers and bleeding. Depending on the presence/absence of *Saprolegnia* spores in the water, fungal infection may appear days to weeks later. The condition may cause lethargy and death in fish, but recovery can also occur, with healed infection sites on fish being visible following recovery.

Frequently asked questions

What action has been taking to monitor and establish the cause? Extensive surveillance and sampling of fish in Scotland has been undertaken to ascertain the cause of RSD. Fisheries Management Scotland and MSS have been collecting information through a reporting scheme during 2019 and 2020 and this has enabled MSS to prioritise field visits to affected rivers and collect samples of fish for analysis. COVID-19 has impacted the ability to collect samples of fish during 2020, however some fish have been sourced to inform the work this year. MSS is presently collaborating closely with the Institute of Marine Research (IMR, Bergen) and the Norwegian Veterinary Institute (NVI, Oslo) where there are facilities to undertake more complex analysis work.

What has the analysis of fish shown so far? Reports from the MSS laboratory analyses are presently inconclusive, and no causative agent has been identified. Analysis of some fish have revealed multiple factors that will have contributed to the condition of these fish. For example, this includes gill pathology, fungal infection, bleeding and parasite infestation *(Anisakis simplex).*

One potential theory under scientific investigation is whether a dietary deficiency among certain salmon stocks or sub-stocks is related to RSD. Investigations are so far inconclusive but emerging research on salmon feeding at sea indicates that different stocks and individuals within stocks can display highly variable feeding behaviour. Gut analysis indicates that while some fish are generalist feeders, others appear to specialise on one or two prey species.

Is it lethal? Lethargic fish with RSD have been observed in multiple rivers across Scotland. Whether this condition can directly result in mortality is yet to be determined, however, it can certainly lead to secondary infections that can have an adverse effect on the health of the fish.

What measures can anglers take? If you have concerns, you should notify FHI (ms.fishhealth@gov.scot). The Fisheries Management Scotland website been updated to provide advice on what you should do, and the FHI have published updated information on their website about reporting red skin disease in wild fish and a summary of the issues reported in 2019.

Does it affect spawning viability? There is no evidence to date that would suggest RSD affects the ability of broodfish to spawn. However, please report if you note issues with juvenile recruitment to the MSS FHI.

Does it transmit between fish in the marine and freshwater environment? The causative factor(s) for RSD have still to be determined. Limited reports may indicate that at least some returning Atlantic salmon enter the river system displaying RSD. More research is required to determine in what environment the fish develop the condition and if/how it transmits between fish.

To what extent are Scottish authorities liaising with others? As stated in the introduction, discussions and collaboration on identifying a cause are ongoing between Scotland and other countries within northern Europe. A workshop was held in November 2019 in Norway to consider the observations on RSD in Atlantic salmon across Europe. As a starting point, MSS along with colleagues in Norway have agreed to try to define a clinical case definition for RSD.

Potential risk to human health from consuming these fish? There is no suggestion at all that fish displaying RSD will have an adverse impact on human health if consumed. In light of current conservation concerns for Atlantic salmon, anglers should be mindful of the need to observe regulations on taking fish and additional voluntary measures for restraint.