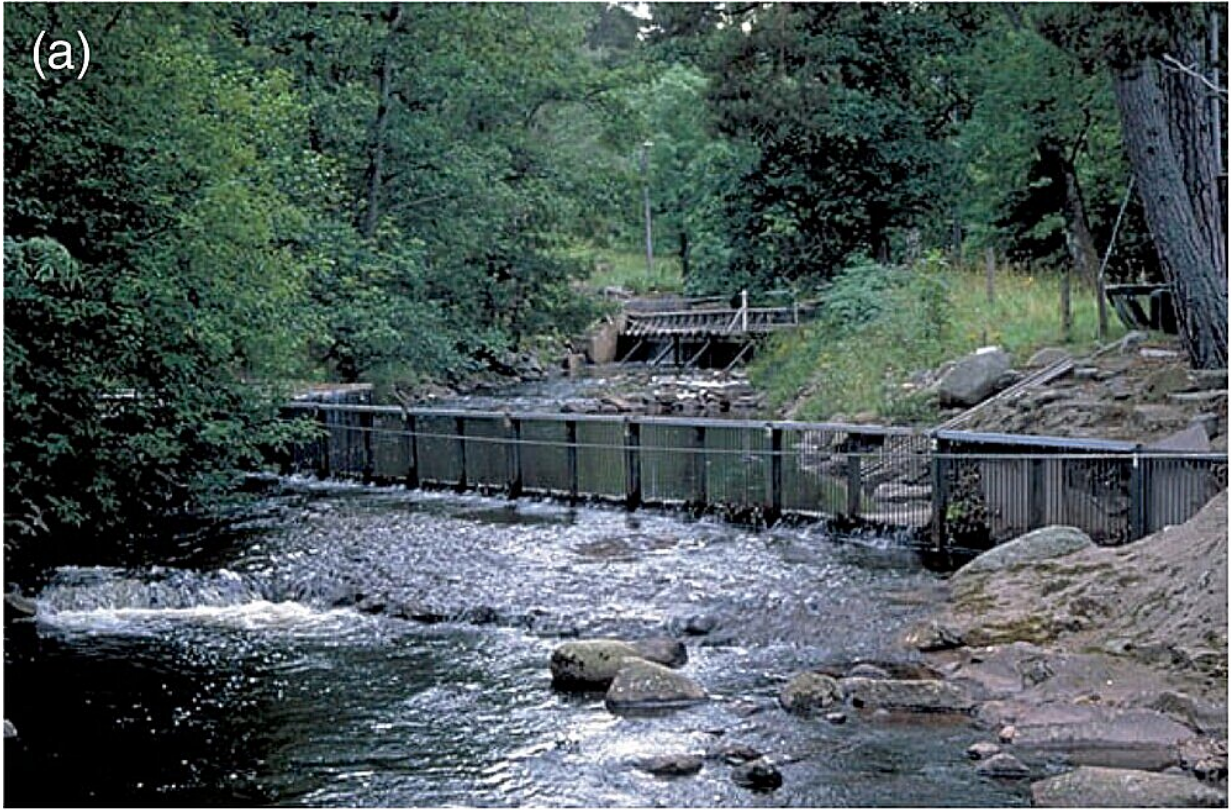


Most detailed long-term study in the world provides science to support Scottish salmon recovery

March 25 2024



(a) The fish traps on the lower Girnock; these are located c.1 km upstream of the

confluence with the River Dee. The lower trap intercepts immigrating adults; the upper trap emigrating smolts and parr. (b) Upper catchment some 5 km upstream of the traps where the channel provides juvenile and spawning habitat. Note the lack of riparian tree cover and montane nature of the upper catchment. Credit: *Hydrological Processes* (2024). DOI: 10.1002/hyp.15105

Six decades of ecological monitoring on a stream close to King Charles' Deeside home is providing the science needed for the fight to preserve one of Scotland's keystone species.

Atlantic salmon have long been identified as a [threatened species](#) because they need marine and [freshwater habitats](#) during their complex lifecycle and both are being affected by climate change.

To gain a greater understanding of this lifecycle, fish traps were installed in the Girnock Burn in Royal Deeside in 1966 to monitor this salmon [population](#).

Now a [research paper](#) led by the University of Aberdeen and published in *Hydrological Processes* has highlighted the insights from long-term monitoring at the site—which is sandwiched between the Royal Estates of Birkhall and Balmoral, within the Cairngorms National Park.

Salmon are an iconic species that is important for both conservation and the Scottish rural economy. The River Dee, like many large Scottish rivers, provides a renowned freshwater habitat for Atlantic salmon (*Salmo salar*) and is popular with anglers from all over the world.

The Girnock, draining mountains and moorland, became of interest to scientists when it was identified as having an important population of "spring salmon"—prized fish that spend more than one year at sea and

return to freshwater early in the year coinciding with the start of the fishing season.

The work carried out there as a partnership between the University of Aberdeen, the Marine Directorate of Scottish Government and the Leibniz Institute of Freshwater Ecology and Inland Fisheries (IGB) in Germany, is the most detailed, long-term study of an Atlantic salmon population in the world. It has revealed quantitative changes in the return rates, distribution, size, growth and age of salmon.

Professor Chris Soulsby of the University of Aberdeen has been involved in the Girnock study for more than 30 years.

He says the strong dataset they have been able to capture over six decades provides vital science that can support salmon restoration efforts in Scotland.

"This is an internationally important salmon research site and, unusually, it has been accompanied by a wide range of related environmental research which helps understand why salmon numbers have declined as a result of climate change which mainly contributes to poor marine survival, but also affects freshwater habitats," he added.

"This 60-year dataset provides a detailed understanding of how salmon populations and their habitat use has changed as the climate has warmed. Unfortunately this shows an alarming decline in the number of salmon returning from the sea, which is consistent with the declining angling catches observed on many Scottish rivers.

"However, from this we can start to build a scientific picture of what management responses to protect fish are likely to be successful. For example, rivers like the Girnock are getting warmer, so planting trees along the banks to increase shade and cool water is likely to help.

However, we also know that juvenile habitat in the river isn't limiting the population, so attempts to 'create' habitat by river engineering are likely to be unsuccessful.

"The protection of salmon populations and the habitats they depend on is vital to Scotland's rural life, economy and employment. However, [climate change](#) is likely to increase the frequency of winter floods and summer droughts which may also affect salmon populations. Continued monitoring at such research sites is essential if Scotland is to have a scientific evidence base to tackle the climate crisis and maintain biodiversity.

"This is a landmark paper in understanding these changes to date and we are delighted University of Aberdeen research is playing a role to provide the science to support this important species."

Professor Doerthe Tetzlaff, co-author at the IGB in Berlin, added, "This review paper is the first synthesis of 60 years of research at this internationally important site.

"The extensive studies have allowed an unusually detailed fish population analysis and brought about a much richer understanding of the ecological functioning of the stream."

"Long-term, robust scientific data is essential to understand how ecosystems are changing in response to a warming climate and to provide a crucial evidence base for informing policy and management to protect a species that is a sentinel of both global and local environmental change."

More information: C. Soulsby et al, Six decades of ecohydrological

research connecting landscapes and riverscapes in the Girnock Burn, Scotland: Atlantic salmon population and habitat dynamics in a changing world, *Hydrological Processes* (2024). [DOI: 10.1002/hyp.15105](https://doi.org/10.1002/hyp.15105)

Provided by University of Aberdeen

Citation: Most detailed long-term study in the world provides science to support Scottish salmon recovery (2024, March 25) retrieved 27 April 2024 from <https://phys.org/news/2024-03-term-world-science-scottish-salmon.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.