Our Backyard â??Galapagosâ?? Lochs

Description

Looking from Aâ?? Chruach over Loch Laidon to Loch Rannoch. Photo credit Nick Kempe February 2025

There can be few among us, who, when they hear the name â??Galapagosâ?? do not have mental images conjured up, of all the wonderful TV documentaries over several decades, perhaps even going right back, as in my own case, to the black and white transmissions of â??Baby-Boomerâ?? childhood. The Galapagos are imprinted on our collective psyche as the archetypal archipelago of evolution and the veritable midwife of Charles Darwinsâ??s seminal opus. Yet Darwin missed out on a much earlier opportunity during his various stays in Scotland (he began his university education in Edinburgh)

Things might have panned out quite differently if Darwin, during his times in Scotland, had relinquished his obstinately held marine transgression theory of the origin of the famous Parallel Roads of Glen Roy in favour of the proposition of a glacial ice-dammed lake origin (and indeed the whole ice age genesis of our mountain landscapes) first revealed to the world via the studies of Louis Agassi, articulated in the Scotsman of 7th October 1840. Had he taken the opportunity to examine some of the 30,000 Scottish lochs, left behind by the glaciers as *de facto* biological â??islandsâ?? in an ice-sculpted landscape, Darwin might have saved himself a long sea trip in favour of discovering another â??Galapagosâ?? right here in our own Highland â??backyardâ??.

The watery landscape of Rannoch Moor, the western part of Loch Laidon in the foreground, a legacy of glaciation viewed from Aâ??Chruach

The Parallel Roads of Glen Roy attest the dynamic forces of glaciations and de-glaciation that set the mainframe of the Highland environment and, likewise, the great, deep fjord-like freshwater lochs of the Highlands and their fish populations. Both their physical nature and their fish fauna are as much part of our glacial heritage as the high tops of the Cairngorms. Just as our high hills were colonised by a relatively small number of northern species, so our Highland lochs were re-colonised after the Ice Age by a relatively small number of fish species tolerant of harsh boreal conditions and both marine and freshwater. Classic examples being Atlantic Salmon and Brown Trout/Seatrout, but, if there is one fish that epitomises our living glacial heritage, it is the relatively unknown Arctic Charr, probably one of our most beautiful native animals.

Arctic Charr from Loch Bhrotain, Gaick area, Cairngorms National Park. Photo Credit Derek Pretswell.

Few of these 30,000 lochs in Scotland have been surveyed in great detail, but as more investigation ensued in the latter half of the 20th century and the first decade of this one, a challenge arose to our concepts of the fish biodiversity they contained, to our understanding of the post glacial re-colonisation process and especially to our conservation priorities. This was strikingly highlighted in four lochs in the upper Tummel (Tay basin) catchment, namely Tummel, Rannoch, Ericht and Laidon, an archipelago of biological islands we thought of as just being â??lochsâ??, but in the end, provided a similar intellectual â??gobsmackâ?? to that Darwin may have felt on visiting the Galapagos.

Some 45 years ago, when I first began sampling lochs for Arctic Charr, we believed they were a very rare fish. My present estimate is 300 charr lochs with more to be discovered. Thus, Scotland is, excepting Fennoscandia, probably home to more natural Arctic Charr populations than any other country in Europe. Arctic Charr are the only member of the salmon family with a complete circumpolar distribution and within that vast area they exhibit a myriad of local forms and variants, not only from lake to lake, but within individual lakes.

The two forms of Arctic Charr. Photo credit Freshwater Fisheries Laboratory, Pitlochry.

Scotland is no exception to that rule, and indeed has provided one of the most clear cut and internationally renowned examples of that phenomenon, via the chance discovery 40 years ago, by Prof Andy Walker of myself, of two distinct forms of charr (a benthic or deep water bottom-living form and a mid-water-living form) in Loch Rannoch exhibiting remarkable differences in body form, ecology and habitat preference. The differences in head and mouth structure alone, is right up there with the beak forms of Darwinâ??s finches.

Benthic Arctic Charr from Loch Treig. Photo credit Derek Pretswell

Subsequent research suggests that there at least 3 forms of charr and possibly 5 in Rannoch. However remarkable that may be in a world context, the story does not end there. In 1985, following up on an old reference, I set nets over 100ft down in Loch Ericht and caught charr very similar to the deep water charr of Rannoch and very different to the form of charr we were already familiar with in this loch. Follow on studies by and with my colleagues Prof. Eric Verspoor and Prof Colin Adams later confirmed close analogies with the two main forms of charr in Rannoch.

The presence of charr in Loch Tummel was only confirmed in the mid-1980s. Follow up studies in conjunction with colleagues Derek Pretswell (mid 1990s) and with Prof.Verspoor (early 2000s), revealed a bottom living form of charr remarkably similar in body form, colouration and ecology to one of the bottom living forms of Rannoch, but which however was not closely genetically similar, thus presenting a profound challenge to our then paradigm of the postglacial colonisation and evolutionary processes of the loch system.

Embarking to do scientific work on Loch Laidon. Photo credit Gordon Brown of Rannoch

Stunning as this discovery was, it was dwarfed by the revelation of what Prof. Verspoor and I encountered during preliminary netting in 2006 of the deep-water zone of Loch Laidon, to see if an analogous deep water charr also existed here. No charr were captured, but we were astounded when we hauled up Brown Trout exhibiting similar physical characteristics to the deep water charr found elsewhere.

Two of the genetically distinct forms of trout from Loch Laidon. Photo credit Aya Thorne

This astonishment reached new levels when more detailed surveys revealed four genetically distinct forms of trout, just as distinct from each other as the Rannoch charr, in body form, genetics and ecology. Loch Laidon is probably the most remarkable wild trout loch on Earth and is the only known one of its kind.


The four forms of trout displayed after a major survey of Loch Laidon in 2020. It is hard to believe the two big Ferox is the same fish. The fish with the fungal blotches, middle bottom, is the deep water

form. Photo credit Eric Verspoor.

Having any individual loch with the fish biodiversity exhibited would be exceptional enough in itself, but to have 4 lochs in such proximity, in the same watershed, showing multiple distinct forms in two genera, is the stuff of textbooks and TV documentaries. This has as valid a conservation imperative as discovering 4 terrestrial islands showing equivalent bird or mammal biodiversity. Are we up to the challenge of the â??Galapagosâ?? lochs in our own backyard?

Introduced pike, a voracious predator, caught in river system above Loch Laidon. Photo credit John Smith.

Pike were introduced to lochs afferent to the Laidon watershed on the Black Corries estate, at or just before 2020 and have now been physically caught in several parts of drainage system just above

Laidon. Data released by the Scottish Environment Protection Agency in 2025 showed pike DNA in Laidon.

Pike in Loch Laidon. Photo credit John Smith

Well, after 20+ years of lobbying government ministers with appropriate portfolios and likewise, the bureaucrats of the NGO-Quangocracy, with the nominal remit and responsibility for the protection of native fish biodiversity, it is obvious that the politicians and the agencies are not up to that challenge

and indeed are insouciant and obdurate in not being so. Introductions of exotic fish species in two of the loch systems now threaten the doom of some the last of our original Ice Age freshwater fish fauna. It is nothing short of a sheer, utter disgrace.

Note on author

Ron Greer on Loch Laidon. Photo credit Aya Thorne

Some readers may recognise Ron from Lesley Riddochâ??s film â??Scotlandâ??s Missing Forests â?? The Great Eco-Conspiracyâ?? which was launched at the last Revive Conference (see here) It has now been viewed over 195,000 times on You Tube.

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1. Cairngorms
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1. conservation

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Date Created
February 4, 2026
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