



Scotland's Arctic Charr



Loch Erich in Inverness-shire is home to at least two different forms of charr that exploit different parts of the loch's habitat

Distribution

The Arctic charr (*Salvelinus alpinus*) is the only member of the salmon family that is found throughout northern and alpine regions of the northern hemisphere.

Like its better-known cousins, trout and salmon, the charr can be both a freshwater resident and sea-going fish and can live in lakes or rivers. In Scotland, however, all charr are freshwater resident and live only in lochs.

As its name suggests, the Arctic charr prefers cold northern conditions, and it is therefore no surprise to find that its strongholds in Scotland are in the Highland lochs. More than 200 separate populations exist.

Conservation Value

Arctic charr were among the first fish to re-enter Scottish fresh waters after the end of the last ice age. Furthermore, since charr have been neither exploited nor managed to any great extent, this long history of undisturbed isolation means that they represent one of the most important national reserves of native biodiversity.

Isolation of charr within single lochs has led to the development of local variant forms. Indeed, in some lochs,

two or more forms have evolved that conduct their lives in quite different ways.

In mainland Europe and in North America, charr are important cultural icons for many northern cultures. In contrast, the charr has not been assimilated into traditional Scottish culture. Indeed, the charr's remote habitats and unspectacular behaviour mean that its presence and importance is easily overlooked.

Biology

Most of the time, Arctic charr aggregate in large numbers in deep water, forming dense shoals. Spawning usually takes place in the autumn and, unlike salmon and trout, charr usually spawn on gravels along the loch shoreline. Occasionally they spawn in in-flowing streams, but the resulting fry migrate downstream soon after emergence and none remain to form stream populations.

Charr eat a very similar range of food items to trout, but where both species occur together, their diets tend to differ. Trout consume more shallow-water insect larvae and freshwater shrimps, as well as wind-blown surface insects and smaller fish. Charr, on the other hand,



consume more animal plankton, deep-water pea mussels and midge larvae; they seldom specialise on fish prey. Charr themselves are a major prey species for the very large trout commonly known as ferox.

Few truly wild charr reach more than 30 cm in length or 300 g in weight. However, when near salmon smolt farms based on net-cages in lochs, wild charr quickly switch to consuming surplus pellets falling through the nets or escaped fish. Under these circumstances, they can reach weights in excess of 3 kg.



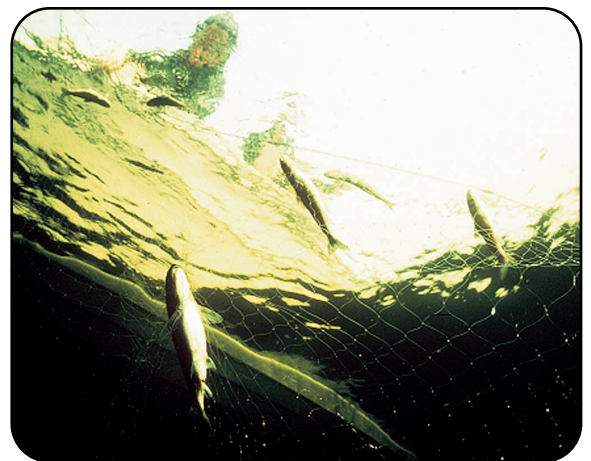
*Male charr in spawning livery: Loch Bhrotain in Inverness-shire
Photo © Copyright Natural Resources Scotland*

At most times of the year, charr show the general silvery appearance typical of most salmonids. In autumn, however, male charr develop a spectacular spawning livery (see above) as they become sexually mature. They do so by moving red-orange carotenoid pigments, previously gained from their diet, to their skin from storage in other body tissues. The intensity of these changes varies from loch to loch, probably because of differences in both feeding and carotenoid pigment production among potential prey species. The charr of Loch Bhrotain, pictured above, are among those that develop the most exotic colourations.

Resource Value

In many northern countries, subsistence and commercial charr fisheries are vitally important to remote communities. Angling for charr is also important. Recreational fisheries for charr have not developed to any great extent in Scotland, but opportunities for novel sport do exist in some of the wildest and most scenic places in Britain.

On the other hand, of all the charr populations in Europe the most pristine and as yet unstudied are those that occur in the Scottish lochs. This brings special responsibilities for conservation, when climate change, water management, nutrient pollution and the introduction of exotic species all threaten the well-being of one of the most interesting of the relict Arctic species.



Researchers gill-netting charr in a northern loch

Further information:

Contemporary data on the distribution of Arctic charr in Scotland are contained in: Davies, C.E. *et al* (eds). 2004. *Freshwater Fishes in Britain*. Colchester, Harley Books. 176pp.