

Pike Anglers Club of Great Britain



Windermere: Long term pike monitoring programme

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Introduction

Recently, some angling media attention has focused on a long-term pike monitoring programme conducted at Windermere in the English Lake District by the Institute of Freshwater Ecology (IFE). Concern has been raised amongst some sections of the pike angling community over these activities, particularly in the light of a recent controversy over pike culling in Ireland. At the request of the Pike Anglers' Club of Great Britain and Ireland, this article has been written to explain the background and current operation of this research. In particular, we will take this opportunity to show that this scientific sampling currently has no adverse effect on the pike population in Windermere and that, in fact, the population is now more abundant than it has been for several decades.

First, however, we would like to emphasise that the current pike monitoring programme as conducted by IFE is not a cull, which is defined in fishery terms as a selective killing or removal of fish for management purposes. In fact, IFE has no management responsibility for the fish populations of Windermere or anywhere else. Rather, its remit is to research and monitor fish populations, and many other aspects of freshwater ecosystems, in order to gain a scientific understanding of their functioning and to enable their appropriate management by other organisations with specific management obligations. Consequently, much of the fish research undertaken by IFE is done so under commission to bodies such as the Environment Agency, the Ministry of Agriculture, Fisheries and Food, and English Nature.

The water bodies of the English Lake District, and Windermere in particular, are some of the most extensively studied and monitored lakes in the world. The resulting information provides society with an invaluable data resource for our understanding of the complex interactions of lake food chains, and important applied issues such as the enrichment of water bodies and global change. It is within this context that the 50+ year pike study, the only one of its kind in Great Britain and Ireland, has made a major contribution to our knowledge of pike ecology and management. Put in its simplest terms, the Windermere pike study is unique, invaluable, and respected by fish ecologists and fisheries managers around the world.

The beginning of the study

While the current pike operations of IFE at Windermere are for exclusively scientific purposes, they did originate from a pike cull undertaken during the Second World War and immediately thereafter. In 1941, an exploratory fishery for perch was initiated by the Freshwater Biological Association (FBA) to produce fish for human consumption. This proved successful and a commercial perch fishery continued on the lake until 1964, running alongside a traditional fishery for Arctic Charr. In an attempt to protect and enhance the perch and Arctic charr populations, the feasibility of operating a small scale gill net fishery for pike was assessed in the winter of 1943/44.

During the above season, 88 pike were successfully caught and killed. Consequently, a much larger scale operation was begun in the following winter, the catch of which was carefully examined and documented. For each pike taken, biological information was gathered on features including length, weight, fecundity, and age. Incidentally, early assessments of the validity of pike age determination using scales and the operculum (gill cover) bone, and showing the greater reliability of the latter, were conducted at Windermere within this study and are now routinely applied elsewhere in Europe and North America. The assessment of fecundity by internal examination and age by examination of the operculum bone both require that the pike be killed. Such data acquisition has continued to this day, evolving from a management cull to an exclusively scientific monitoring programme.

The evolution from cull to scientific monitoring and its consequences.

As the reason for the pike programme changed from a cull to scientific monitoring, the sampling effort was accordingly greatly reduced such that present levels are comparable with those of the exploratory fishing of 1943/44 (Fig. 1).

n 1989, responsibility for this operation passed from FBA to IFE. An extremely important point to appreciate is that the integrity of this long-term study has only been maintained by keeping its methodology unchanged except for this reduction in sampling effort. Thus, a given amount of gill netting set in 1998/99 will catch approximately the same number of pike as it did in 1943/44, as long as the abundance of pike has stayed the same. However, if pike had become scarcer in the lake, then the catch made by a given amount of netting would have decreased. Changes in the value of this catch standardised to a certain amount of sampling, or catch-per-unit effort (CPUE), are widely used in fisheries management to track changes in the abundance of fish populations.

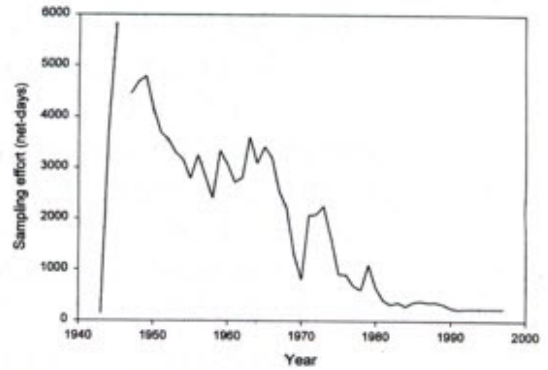


Figure 1. Changes in sampling effort from 1943/44 to 1997/98. The break in the line results from sampling disruption during the winter of 1946/47 when the lake froze.

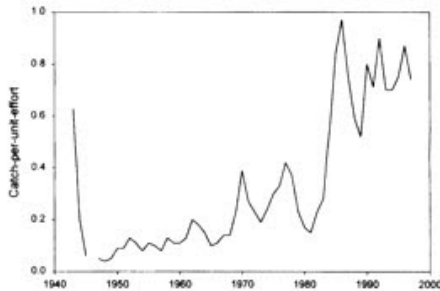


Figure 2. Changes in catch-per-unit-effort of pike from 1943/44 to 1997/98. The break in the line results from sampling disruption during the winter of 1946/47 when the lake froze

Fig. 2 shows changes in the CPUE of Windermere pike from 1943/44 to 1997/98.

Following a dramatic reduction in CPUE in the first few years, testifying to the efficiency of the initial cull, there is a long-term upward trend. This indicates that pike are now more abundant than at any time since the winter of 1943/44. It is noticeable that a decrease in the pike sampling effort during the late 1960s, following the closure of the commercial perch fishery, was accompanied by an increase in pike abundance. Further reduction in the pike sampling effort was made by

FBA on conservation grounds in the late 1970s after disease had killed 98% of perch, giving rise to fears concerning the consequences of this reduction of one of the Windermere pike's main food sources. Again, this reduction in sampling was followed by an increase in pike abundance. For the last 14 years, pike abundance in Windermere as assessed by CPUE has been comparable with that of the un-culled population in 1943/44.

Further evidence of the current lack of impact of the monitoring programme is shown in Fig. 3 in terms of the size structure of the female component of the pike population. In the essentially un-culled population of 1944/45, which had been only lightly fished the year before, a wide spread of individual weights was recorded with an average female weight of 11.2 lb and 8.9% of female fish weighing 20 lb. or more (Fig. 3a). In contrast, the heavily culled female population of 1950/51 had a more restricted weight distribution, an average weight of 7.6 lb., and only 1.5% of fish weighing 20 lb or more (Fig. 3b). The current female pike population as described using data from 1997/98 resembles that of the essentially un-culled population of 1944/45, with a wide spread of individual weights, an average weight of 12.6 lb, and 15.4% of fish weighing 20 lb or more (Fig. 3c). Furthermore, in recent years the average weights of both female and male pike have substantially increased. The Windermere pike population thus currently shows no significant adverse effects arising from the monitoring programme, whether they are assessed as population abundance or as individual size.

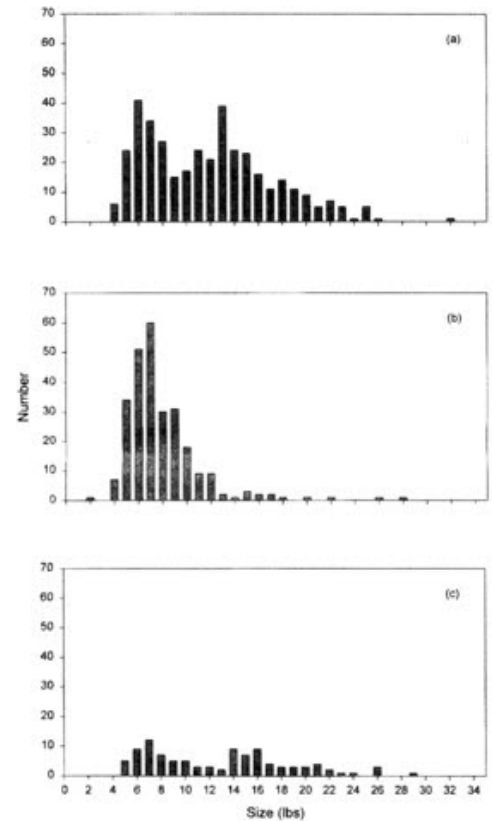


Figure 3. Size structure of female pike in (a) 1944/45 when essentially unculled, (b) 1950/51 when heavily culled, and (c) 1997/98 when subject to the current monitoring programme.

