



Fact Sheet (5)

The Effect of Pike Removal

A Synopsis of published scientific data.

The relationship between any fish predator and its prey is perhaps best described by the comprehensive experiments reported by 'Swingle 1950'. These involved the study of predator - prey relationships in 89 separate ponds, containing fish populations that had been established for between 2 and 30 years. In his definition of balance, Swingle concludes that this implies a combination of species. Including at least one piscivorous (carnivorous) species.

The studies on the status of the ponds 'balanced or unbalanced' revealed that the predator - prey ratio, by weight of balanced ponds was between 1:1.4 to 1:10; 77% of the best 'balanced' populations had ratios of between 1:3 and 1:6. Conversely, 'unbalanced' populations had ratios of between 1:0.06 and 1:63; most unbalanced populations had a relatively small weight of predators in relation to the weight of prey.

It appears that the weight of prey present is a function of the fertility of the water, whereas the weight of predators is, within limits dependant on the weight of prey fish species present.

The most exhaustive work undertaken in Britain has taken place on Lake Windermere, where pike have been removed for scientific purposes since the 1940s. The results are complex, but can be summarised, see the following: -

- There was an initial drop in the NUMBERS of pike but these have remained relatively stable for many years.
- The average size of the pike has fallen.
- Their speed of growth has increased.
- Food availability (rather than the size or species of prey) controls diet.
- The only species in the lake to show unequivocal upturn in its numbers is Char. This species is particularly vulnerable to pike predation when seasonal shoals are formed.
- Pike cannibalism is reported as 'rare' with individuals of less than 16" normally being taken.

Other studies reveal a higher incidence of cannibalism - Toner (1969) records that small pike formed 25% - 32% of the food of other small pike.

Otto (1979) studied the effect of pike removal on a Swedish lake, defining three phases: -

A brief initial phase in which the proportion of large pike increased (due, presumably to the high susceptibility of small pike to capture or to an increase in growth rate of remaining pike).

A phase in which the number of small fish increased in number (due to reduced cannibalism and /or increased intraspecific i.e. pike on pike competition).

A phase in which small and large pike numbers do not change.

It is worth reporting that the weight of pike present did not change markedly.

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Other studies relating to pike removal shed few new facts. There appears to be NO reports of studies on the effect of removing only large pike or indeed, returning only large pike. It is interesting that many studies on pike have been conducted into the best methods of conserving/stocking this species. Bouquet (1979), records ways in which Dutch fishery management work focuses on maintaining high levels of pike and zander in their fisheries carryout annual stockings to maintain their numbers.

Several other facts are worthy of note: -

- There are no reported instances where pike have reduced the levels of prey fish to unacceptable proportions.
- Pike are an indigenous species in Britain and have been living in balance with their food for as long as they have been present many thousands of years.
- Predation on wildfowl by pike is rare, and can be matched (or exceeded) by water bird predation on pike fry and eggs.
- Evidence from countries where pike and fish-eating birds like Ospreys etc are present, does not suggest that such birds were ever a major controlling factor of pike numbers.
- It is very difficult to totally eradicate pike from any water. Generally this is biologically only desirable when prey species do not breed successfully i.e. trout and some carp, Stillwater fisheries or where other forms of prey control can be successfully practised. If pike predation can be replaced by say netting and removing prey fish or by angler's killing a percentage of their catch, these could constitute a substitute for pike predation. Population dynamics are, however, improperly understood and it is likely that these substitutes would often fail to reproduce the natural control of numbers and sizes naturally produced with pike predation.
- In order to increase the numbers of non-predatory fish present in a water, effort and resources would be better expended on increasing water fertility and habitat diversity rather than haphazard pike removal. Indeed if the survival of prey species is paramount, it would be wise to radically improve methods of fish handling, unhooking and retention, which often produce high mortalities. i.e. if you are THAT concerned about numbers of roach etc present, scientific studies suggest that you'd be better advised to ban keepnets and insist on barbless hooks rather than instigate a pike cull.
- Pike are and can be demonstrated to be a popular and valuable asset in many fisheries.
- Demand for pike fishing of good quality is great, and pike anglers make a significant contribution to the budgets of water authorities and angling clubs. If the pike fishing is poor, pike anglers will go elsewhere taking their valuable financial contribution with them.
- There has not been a single reported instance whereby the use of live or deadbait legally obtained from elsewhere has caused the spread of an infection or resulted in fish mortalities.

