

Zander in the canals system

by Dr Phillip Smith



Canals and canal fishing are part of our heritage. Fishing on canals is important to anglers because it's easily accessible, there's fish to be caught and it doesn't cost too much!

Canals are great locations to introduce new blood to the sport – many famous anglers from [Ivan Mark](#) to [Rob Hughes](#) first started fishing on their local canal. I first learnt to fish on my local [Leeds & Liverpool Canal](#).

When anglers think that their canal fishing is under threat they are quick to act. A decrease in fishing catches means that angling clubs do not rent sections of canal for their members.

Threats to canal fisheries

Threats can come in many ways such as pollution, breaches and habitat loss. These tend to be obvious as the effects are visible – who hasn't seen thousands of dead fish and thought there has been a problem! Less obvious, and perhaps more controversial, has been the illegal introduction of the [zander](#).

This predatory fish was first introduced and was breeding in some of the midlands canals by the late 1970s. Associated with this there was a perceived decline in catches of other species. There was a significant reduction in numbers of angling clubs choosing to rent fishing rights on canals where zander were present. Less income from angling clubs meant a reduction in monies to help maintain the waterways.

Studying zander

From a fisheries management perspective, it was important to understand if Zander **caused** the decline of fishing quality or if it was blameless and the decline was due to other factors. Also, if it did have an effect, then it would be useful to know what management options would work.



I studied zander over a six year period in the mid-1990s and have had an interest in them ever since. This article is a reflection on my original research taking into account my various angling experiences, reading the angling press, accessing various information on the internet, conversations with angling clubs and the Canal and River Trust.

The evidence base for understanding the effect of zander introduction

As part of my degree in freshwater biology, I spent a year working for British Waterways. During that time, I completed a project that reviewed what was known then about zander in the canal system. I also did a comparative study on the fish populations in the north [Oxford Canal](#). Although this study was a relatively small undergraduate project, it did suggest zander did have a negative impact on some other fish species.

A couple of years later British Waterways provided funding and support so that I could do a more extensive study which formed my doctoral thesis "The impact and management of Zander". This was undertaken between 1994 and 1998. It mainly looked at the [Coventry Canal](#), the [Ashby Canal](#), the [Birmingham & Fazeley Canal](#) and the [Trent & Mersey Canal](#) though some of the work was based around data from the Oxford Canal.

Postgraduate studies

The approach used for the three year PhD study was based around a detailed survey of fish populations in zander-colonised sections of the canal system. These were compared with nearby sections that were only recently or not yet colonised.

This involved the netting of 58 sites and the capture of 58,585 fish including 19 species. Zander were assessed mainly through the use of electrofishing surveys. This assessed the distribution, growth and feeding based on the stomach contents of 2733 zander. A total of 657 zander were tagged and their movement monitored. Of particular relevance was the electrofishing of three sections of canal, totalling 24.3km on five occasions over a 24-month period. The information obtained, when viewed within the context of what is already know about canal fisheries, enabled some conclusions to be made in relation to the impact and management of zander.

Impact of boat traffic

The overall finding was that the numbers of boats using a canal was the main factor in determining the numbers and types of fish present. Canals with only a low amount of boat traffic tend to be characterised by having clear water, lots of water plants and a fish community of [roach](#), [perch](#), [bream](#), [tench](#), [rudd](#) and [pike](#). Canals with high volumes of boat traffic tend to be turbid, (chocolate coloured water) have few water plants and have a fish community of mainly roach and [gudgeon](#) with numbers of perch, bream, ruffe and other fish species.

Zander distribution and impacts

If we look at the abundance and distribution of zander in the canal system we see that once introduced they can establish populations that are relatively large in those canals that have a high level of boat traffic, turbid water and few water plants. In these environments, the diet of zander is mainly fish of less than 15cm in length. Roach are the main food but it appears that Zander actively choose to eat gudgeon rather than other fish if they can.

The effect is that gudgeon can be almost wiped out and roach numbers, especially those less than 100mm long, can be severely reduced. There is no doubt that the zander is at an advantage in these murky waters because it has a specially-adapted eye to see in low light levels.



Populations of gudgeon decline rapidly once zander become established on turbid boated canals.

From a fisheries management perspective, the research supported the suggestion that the introduction of zander **causes** a decline in fishery value for those canals with a high level of boat traffic. **This can partly be explained by the observation that 75% of those fish caught by anglers fishing canals were less than 100mm and this is the size range of fish that are impacted by zander.**

In canals with low boat traffic the water is much clearer, there are many waterplants and whilst zander may establish populations these are relatively smaller than those in heavily-trafficked canals and it appears that they have little, if any effect on other fish.

Manging zander populations

Options for the removal of zander was subject to a very detailed assessment as part of the PhD. The main conclusion was that electrofishing had to be very intensive and has to be repeated over a number of years before it would have a significant effect. This is because electrofishing has a low efficiency for capturing small (< 20cm) zander. I concluded that to significantly reduce the abundance of zander using electrofishing, then 80% of the breeding adults would have to be removed every year.

Based on the equipment available in the mid-1990s this meant that the work would need to be repeated at least three times a year. With recent advances in the effectiveness of boom boat electrofishing equipment, coupled with the use of a back boat, twice per year could now be sufficient.



Both the Canal & River Trust and the clubs that rent fishing rights on the middle [Grand Union Canal](#) are anxious to avoid further southerly spread. The rate of natural colonisation of the canal system by zander could be significantly slowed down by electrofishing those sections which contain zander at the edge of their range.

Reducing canal turbidity

Over the years, I have had many conversations about what could be done about zander. These have included some wacky suggestions such as making the water less turbid by filtration, banning boat movement for a few years to make the water less turbid and bizarrely the use of a magnet to scoop up suspended clay (apparently clay is magnetically charged!). A reduction in turbidity could also be achieved through significant widening and deepening of the narrow canal network. This would cost billions of pounds and would be a project on the scale of HS2 but if continuing drought and a north west to south east water transfer become a serious option, then you never know.

Habitat improvement and restocking

Other ideas mentioned by angling clubs have included the introduction of hiding places for roach and gudgeon to stop them being eaten eg. the use of Christmas trees and so on. Most of the canal network is heavily boated and the introduction of anything which was a hazard to navigation would not happen. Some also suggest stocking fish which are too big (ie. > 15cm) to be eaten by zander. The challenge with that suggestion is the sheer costs that would be involved. Where would the funds or indeed the fish come from?

Clarification of the legal situation of non-native species

Zander are currently classified by DEFRA as a non-native invasive species. As the law stands any zander or any other [non-native fish caught](#), whether in fish rescues by the Trust or by anglers must not be returned to the canal network. This is clearly stated in [Trust KIFR permits](#). Back in 2015, the Canal & River Trust fisheries team applied to the EA to develop a Midland canal zander zone where zander could be returned by anglers and relocated after capture from other locations, but this solution was not legally permissible.

Tasty dish

I love canal fishing and also like to capture zander. As it is currently **illegal to return them** you can always eat what you catch - a common practice across much of mainland Europe. Zander are a really great fish to eat – better than pike, trout or salmon – but don't forget to remove the skin as it has many scales! My

favourite way to eat them is to bbq them in a tin foil parcel. Other ways include deep fried in batter or in a dill sauce and pan fried.

On a more serious note, while we may control the further spread of zander and the establishment of new illegally introduced populations such as those of the northern Trent & Mersey Canal, I strongly believe we cannot eradicate them. I wonder if in twenty years' time we will regard catching or eating zander to be part of our heritage?

End.