

A new approach for still water trout fisheries

The fish louse *Argulus* is a highly damaging parasite and one of the greatest disease threats to still water trout fisheries. National Fisheries Laboratory have been trialling a new approach to help control infections in still waters. The aim is to provide fishery owners with a cheap, simple and effective way to break the life cycle of the parasite and reduce future disease problems.

The fish louse *Argulus*

Argulus is a common parasite of freshwater fish, found in fisheries throughout the UK. Adult lice are flat, round, jelly-like parasites that feed on skin and mucus. Heavy infections can quickly cause irritation, condition loss and death.

Argulus reproduce by laying eggs in long strings on any hard substrate. Female parasites start laying their eggs in spring when water temperatures rise above 10°C and will lay through the year until water temperatures drop below 10°C. Eggs will hatch in around 16 days at 20°C, longer in colder temperatures. During winter many adult parasites will die off and it is mainly the egg strings that overwinter, dictating infections the following spring.

The problem of managing *Argulus*

There are a range of management measures that can help reduce *Argulus* infections in trout fisheries (please see our factsheet 'Managing *Argulus* in still water trout fisheries'). These mainly focus on stocking practices to reduce the amount of time trout are exposed to the parasite. Whilst these approaches can be effective, they are not always feasible and can be expensive.

Another difficulty with managing *Argulus* in fisheries is being able to monitor parasite levels before they become a problem. Counting



Argulus found on the skin



High levels of Argulus found on trout

lice on the fish caught by anglers can lead to an underestimate of a problem and hinder awareness of how the parasite population is developing through the year.

These challenges have highlighted the need for a simple, cheap and effective solution to break the life cycle of the parasite and help fishery owners to both monitor and reduce lice burdens in still water fisheries.

Trialling a new approach

During 2017, staff at NFL Brampton have been trialling a new approach to break the life cycle of Argulus by harvesting the egg strings of the parasite. This is based on the use of plastic pipes that are placed in the margins of a fishery to act as an artificial egg laying substrate.

Four still water trout fisheries with a history of Argulus problems were used to trial this approach. At each site, lengths of black pipe were installed vertically in the margins, each supported by a wooden fence post. Every two weeks the pipes were raised using a simple locking device and the number of egg-strings counted. Each pipe was then left to dry, killing the eggs before being replaced.

Initial results of this project have been encouraging. In all of the fisheries trialled, the pipes were successful at harvesting Argulus egg strings. The most egg strings harvested on a single pipe within a two week period was 4,600, comprising over half a million eggs. Between June and November 2017, an estimated 14 million eggs were harvested and removed from individual trial sites, with a reduction in lice burdens on the trout and an improvement in fishery performance



Multiple egg strings laid on a pipe during the recent trials (left). Marginal pipes raised to dry at a still water trout fishery (right), where over 14million eggs were harvested and removed during the summer.

Wider testing required, please get in touch

These trials suggest that marginal pipes could provide an effective way to monitor egg laying activity and kill large numbers of parasites in the process. It is too early to say whether this provides a longer term option for Argulus control, but we are keen to raise awareness of the work and support trials at more sites.

If you are interested in exploring this approach at your fishery, please contact us so we can offer advice on the best way to proceed. The success of this approach will rely on many different factors including the size and characteristics of the fishery, existing egg laying sites and other management practices, so these need to be considered as part of a wider management plan.

You may be able to obtain some funding for this initiative through our national Fisheries Improvement Funds. For more information on this please get in touch with us, or contact your local fisheries officer.

Equipment and installation

The pipes used during our trials were 1 meter lengths of black 110mm waste pipe, placed over 1.7m wooden fence stakes. These were positioned in the margins of the fisheries by means of a post-driver. Pipes were positioned at intervals allowing easy access in waders but away from popular fishing spots. The pipes were placed in approximately 1 meter of water and the top few inches of the posts left exposed to these to be identified. In some fisheries, small predator spikes were placed on top to avoid being used as a cormorant perch. In order to raise and dry the pipes, a hole was drilled through the top section of both post and pipe to allow insertion of a tent peg (on a chain) to lock the pipe in place for drying. At some fisheries a spare set of pipes were used and rotated between drying periods.



Lengths of black pipe supported by a wooden posts (left) and positioned in the margins of the fishery (middle). A peg inserted through the top (right) allows the pipe to be raised for drying.

Number and position of pipes

The number of pipes required for each fishery will depend on size, fishing activity and how many can be feasibly managed through the egg laying season. During the 2017 trials, pipes were placed in easily accessible points around the margins away from areas where they may hinder angling. Feedback from anglers suggest these posts posed minimal disturbance to fishing or boating activity.

The fisheries we have been working with ranged in size from 1.5 to 24 acres. The number of pipes installed at these waters varied from 10 to 30 respectively. Pipes can be spread out or grouped, although more coverage is likely to increase their usage. Particular attention should be given to areas within the fishery used by the fish, especially during the warmer months e.g. water inlets. Our preliminary results suggest that pipes surrounded by reeds or lilies are less productive than those clear of surrounding vegetation.

Checking for egg strings

Once installed, each pipe should be checked, cleaned and replaced every two weeks. This can be done less frequently in cooler conditions but any longer in summer will allow the eggs to hatch before they are killed. Eggs are highly sensitive to drying. This may take as little as half an hour in warm sunny weather or several hours in cooler conditions. Once dried, egg strings will start to peel away from the pipe surface. Alternatively, eggs laid on the pipe can be scraped away with a stiff brush, finger nail or blunt knife.



Checking the pipes for egg strings provides a way to monitor the status of the lice population within the fishery. It is hoped that this approach will provide a quick and simple way for fishery owners to monitor infections and to use this information to inform fishery management practices like stocking.

When to install these pipes

It is important to have any egg laying substrate installed throughout the warmer months when the parasite is reproducing. Having pipes installed during spring will enable the first batches of eggs to be removed and will help reduce the size of the parasite population that develops through the year. The same applies to autumn, which is when Argulus lays its eggs to overwinter. Harvesting as many egg strings as possible during the autumn will greatly reduce the size of the parasite population that hatches the following spring.

Once temperatures drop below 10 °C egg deposition will cease so pipes can be removed if needed. Winter is also an important time to remove eggs from any other hard structures like boats or buoys.

Parasite eggs or snail eggs?

It is likely that other invertebrates like snails will also lay their eggs on the pipes so it is important to distinguish these from the eggs of Argulus. Eggs laid by Argulus are cream coloured, turning yellowish as they harden. They are firm to the touch and generally smaller and less gelatinous than snail eggs. We have developed a quick guide to help you with get this right, so please get in touch if you would like a copy and are interested in exploring this approach further.



Please get in touch

The National Fisheries Laboratory are here to help with any fish health related query or suspected disease problem. Please get in touch if you would like to discuss any of this further. We are interested to hear of your experiences with this initiative or any ideas of how you think we could improve this for other fisheries.

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