

# Biosecurity for anglers – planning for the future

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## Background

For many years now numerous waters have suffered from the effects of signal crayfish, himalayan balsam and mink. These are just three, high profile, organisms that come under the banner of ‘invasive non-native species’. The term *invasive* is important, this means they can seriously damage and modify our ecosystems. It is also interesting to note that 96 freshwater species, not native to the UK, have been recorded in the River Thames catchment. Admittedly not all these are damagingly invasive but it does make it one of the most highly invaded freshwater systems in the world. The Millennium Ecosystem Assessment Report (2005) notes that ‘the introduction of invasive non-native species is one of the major causes of species extinction in freshwater ecosystems’. The report also notes that control or eradication of invasive non-native species, once established, is extremely difficult and costly. Prevention and early intervention are far more successful and cost-effective.

Since 2005 we have had new invasive non-native species turn up in the UK. In 2010 we added the killer Shrimp - *Dikerogammarus villosus* to the list. This species was originally identified at Grafham Water, Cambridgeshire in September 2010 and subsequently at Cardiff Bay and Eglwys Nunydd in South Wales. In March 2012, a further population was found at Barton Broad, in the Norfolk Broads. Importantly here, note the phrase ‘originally identified at Grafham Water’. This does not mean where it first appeared in the UK, that place is not known and may still be awaiting discovery, and no doubt there are other populations yet to be found. In October 2012 another *Dikerogammarus* species was discovered, this one is *Dikerogammarus haemobaphes*. It was found on the River Severn at Tewkesbury, the Bevere near Worcester, and also in two Worcestershire canals. Although related to the killer shrimp *Dikerogammarus villosus*, it is not yet clear what the impact of this species will be. However, it is being treated as a high impact species while further assessment is taking place.

In response to the *Dikerogammarus villosus* discovery the “Stop the Spread” campaign was initiated and publicised, this was based on the concept of “clean, check and dry” your clothing and equipment before you leave a watercourse in an attempt to stop the spread of aquatic invasive non-native species. It is aimed at all water uses and not just anglers. This was, and still is, a great idea but I feel it is now time to seriously step up our efforts to protect our wonderful but incredibly fragile aquatic ecosystems. And, at the very least there should be a serious debate on the way forward.

## The Threats

First and foremost we need to recognise and acknowledge the vectors by which aquatic invasive non-native species can be spread, there are obviously very many of these but they can be split into two distinct groups. In one group we simply have no control at all such as natural wildlife movement (birds or animals moving from water to water), the general public on public rights of way, via water craft in navigable areas or other water sports on private waters. Also in this group are illegal deliberate movements of plants and animals (as what often happens with signal crayfish) or as a result of illegal activities; poaching and unauthorised canoeing are just two examples of these.

However, in a second group we **do** have some control measures within our powers and it is this group I want to discuss. I am thinking particularly here of fishing activities on private land and waters whereby everyone has to follow rules. Before we pursue this further let's look at how an 'angler' can become a vector for the spread of invasive non-native species and other aquatic viruses and diseases. The most obvious is via waders, wading boots, wading sticks, bank sticks, wellingtons, nets, bass bags and boat drogues. I am sure the list goes on; nonetheless all this kit is what actually spends much of the time in the water whilst the angler is fishing. Now the Stop the Spread guidelines should cover this but it relies **TOTALLY** on the good will and diligence of the anglers. Moreover, the guidelines are aimed at those leaving a watercourse, not someone arriving. In addition, the guidelines will not protect against anglers fishing with natural or semi natural bait (as opposed to artificial baits like spinners, plugs and artificial flies and lures) that could harbour all sorts of damaging organisms. Not forgetting these baits are not just used by anglers on their hooks, where "ground baiting" is allowed, masses can often be thrown into the water to encourage fish to feed.

## Control Measures

So, now we have established some possible methods anglers can, inadvertently, spread invasive non-native species let's look at some control measures. The most extreme measure would be to simply ban anglers from the water, but this probably would not go down very well with the anglers and I fear club and fishery finances would suffer!

More realistically a fishing club could request (or even insist) that an angler's waders, wading boots, wellingtons, nets, bass bags and boat drogues etc. are only used on their water and not used in other places. In the case of bait fisheries, other restrictions could be put on the baits allowed and ground baiting methods employed. This already happens at some fisheries where you have to use nets provided by a fishery and restrictions are put on baits and methods that can be used. Clearly no commercial fishery can supply wellingtons or waders to everyone. Nevertheless, it can be insisted on that when an angler arrives at a water these are totally dry, are free from mud (this can carry many viruses, diseases, plant fragments, seeds, or microscopic eggs etc.) and are visually checked. Add to this a requirement that all nets (not supplied by the fishery), waders, wading boots and wellingtons etc. that are not clean and dry are treated with a recommended disinfectant such "Virkon S", on site, before any fishing starts. It also needs to become more common place for the Stop the Spread guidelines to be followed before the angler departs a venue, in most cases this is just not happening at the moment. Virkon S is a wide spectrum multi-purpose disinfectant for use against viruses, some fungi, and bacteria. Obviously with Virkon, or any other chemical treatments, there would need to be some guidelines on safe usage and disposal methods. Such guidelines would need to be agreed with all the relevant statutory bodies (e.g. DEFRA, and the Environment Agency in England) and unfortunately Virkon it is not considered effective against killer shrimps.

However, all is not lost; it has been shown that simple domestic hot water (above 43°C) can kill the shrimps. So simply rinsing your wading boots (or wellingtons), the wader feet, gravel guards and nets etc. in nothing more than a bucket of hot tap water (say 45°C or more) after your fishing day and then leaving them for 15 minutes bathing in the same hot water before hanging them up to dry could be an additional simple method to help prevent killer shrimps from being unintentionally spread by anglers. This is already being encouraged in some areas and I believe it is a great idea.

Then there is the general behaviour of the fishing club members (or paying day ticket visitors) to consider, they must be made responsible not only for their own biosecurity but that of their guests they bring along. The same should go for fishing guides, gillies or instructors who should not only be responsible for their own biosecurity but also that of their clients, make this a requirement not a request. Maybe all this is beyond the pale and some debate needs to take place to reach realistic working measures. But, while having these debates do not neglect the fact that you are not just trying to control the spread of the 'known threats' but also of those not yet identified. Think of it in terms of human disease control, when you know someone is infected it is easy to contain the situation but trying to control undiagnosed carriers is the challenging part. To add to the complex issues involved it will be necessary for fishing organisations and clubs to talk to each other, especially on rivers where you have different clubs controlling different parts of the same system.

To conclude, many other countries in the world take the protection of their native wildlife and biosecurity very seriously. Regrettably, in the UK we do not, and that is unlikely to change via legislation any time soon. We (the anglers) need not only to keep our own house in order but be seen by the general public to be serious about the protection of our fragile freshwater ecosystems and lead by example. And, as I have said, at the very least start a debate and become much more proactive than reactive to the many threats from invasive non-native species. If you are reading this and you are on the committee of a fishing club or organisation why not think about a "Biosecurity Officer". A Biosecurity Officers role would involve keeping up to date with the latest threats and the spread of invasive species. They would also need to review and update control measures to reflect the latest threats and best practice advice on biosecurity issues, obviously all based on good science.

Finally, if we are to continue to enjoy our wonderful sport on our precious waters into the future then clearly our attitude and culture will have to change to meet the growing threats, and think on this - if we do not do it, who will?

## Case Study – A salutary tale in favour of biosecurity

During October 2012 I went away with three friends David, John and Oliver to fish some wonderful parts of the world famous River Itchen for grayling.

After our final morning on the river I walked with David back to the car. This was a good 200 metre walk through a mixture of dense undergrowth and thick grass. By the time we reached the car we both commented on how clean our boots and waders were having come through this type of vegetation and this had made a pleasant change from being thick with mud! As I took off my waders I spotted a shrimp under the gravel guard which I indicated to David, this prompted both of us to check our waders & boots carefully for other creatures and then spray them down with some `Virkon S` that I had with me in a pressure spray. After doing this, and feeling rather smug, we packed away our clean and disinfected waders & boots for the long journey home. However, and I digress for a moment, I have to say from a biosecurity perspective I don't like all the flaps and crevices on stocking foot waders, gravel guards, and wading boots. There are many places inverts and other beasties can hide and they can stay damp for ages, as for felt soles on boots and waders; well they just never seem to dry at all! The more old-fashioned boot-foot types are far easier to clean and dry. Now, back to the story; after our long journey home and a good night's sleep I started thinking about the waders and boots again. Consequently, I decided to rinse off the waders and boots in a bucket of clean tap water. I then poured the bucket of water into a shallow plastic tray to see what was there. Just as I expected there were bits of grass and plant material but other than that all looked okay. Then I noticed some movement; two shrimps happily swimming around! This was despite the waders being hung up overnight and the boots left to dry, not to mention the fact that they would have been stewing in the Virkon residue in my bag for the several hours it took to drive back home.

So there you go, after a 200 metre walk through undergrowth, a thorough check, a spray down with Virkon, several hours of the waders & boots stewing in "damp" Virkon residue and hanging overnight in my kitchen the shrimps were still alive along with a tiny aquatic snail and a flat worm for company! The shrimps were our native species but I have no idea what the snail and flatworm was. Moreover, what about all the small particles of plant and maybe seeds – what were they? And, the unseen microscopic stuff or viruses were any of these harmful? In short, I have no idea but one thing I can be 100% sure of is if I had gone fishing on my local water the day after my trip to the Itchen I would have washed the whole lot into my local river. Thankfully this could not have occurred because I have waders and boots that I use there and nowhere else. If I had followed the "Stop the Spread" guidelines to the full and completely dried the boots and waders (the last stage of the guidelines) then of course that would have killed all the aquatic life hitching a ride, but how long this would have taken is still an inexact science. Additionally, if I could have hosed down or rinsed the wading boots, the feet of the waders and the gravel guards in a bucket of water BEFORE the drive home (also recommended in the Stop the Spread guidelines) then that could have been enough to dislodge the hitchhikers too – but again this is far from fool proof. For me personally, I will be continuing to have a set of waders and boots for my local river and another set for when I am in other areas. After use these can be rinsed in a bucket of hot tap water (45°C or over) when I get home and left to bathe for around fifteen minutes (just time for a cup of tea!) before getting hung up and allowed time to dry out completely between visiting different locations. As an angler who visits many areas of the UK over the course of a season I can see no other way to be sure I do not transfer any species from one area to another.

## Acknowledgments

During my research on biosecurity issues I have had a lot of help and assistance from the following organisation:

The Riverfly Partnership:

[www.riverflies.org](http://www.riverflies.org)

Environment Agency (EA):

[www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

Scottish Environment Protection Agency (SEPA):

[www.sepa.org.uk](http://www.sepa.org.uk)

Angling Trust:

[www.anglingtrust.net](http://www.anglingtrust.net)

Non-native Species Secretariat (NNS):

[www.nonnativespecies.org](http://www.nonnativespecies.org)

The Centre for Environment, Fisheries and Aquaculture Science (CEFAS):

[www.cefasc.defra.gov.uk](http://www.cefasc.defra.gov.uk)

The Freshwater Biological Association (FBA):

[www.fba.org.uk](http://www.fba.org.uk)

As well the organisations listed above I would like thank, by name; Bridget Peacock, Craig Macadam, Olaf Booy, Louis Kitchen, Moreno Barriero, Paul Stebbing and Will Burchnall without their help, advice and patience again much of this could not have been done.

## About the Author

My name is Stuart Crofts, but who am I to advise you on Biosecurity? By way of introduction I have been a Fly-Fishing Guide since 1998. I also work, part-time, as a Course Tutor with the Riverfly Partnership. I have worked on river restoration projects on the River Don in South Yorkshire for almost forty years and spent a lifetime studying aquatic entomology. Perhaps most importantly of all is that I care passionately about the wellbeing of our waterways and its native fauna & flora.

My motive for doing this report was to give anglers, angling clubs/associations and everyone who is involved in the world of angling some thoughts and ideas to help them better protect our waters from the endless threats posed by invasive non-native species in Great Britain. I assure you I have not just plucked my recommendations in this report from thin air but as a result of a lot of work and communications with all the organisations and individuals named in the acknowledgments above. My wish is that it inspires you to act; only by working together, alongside the regulatory bodies and with all other water users can we hope to protect our amazing aquatic ecosystems.

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### **Biosecurity for Angling Clubs, Associations and Syndicates**

Here is a list of recommendations for you to consider that may help protect your fisheries from invasive non-native species that can, and do, devastate fisheries.

- Make all your members aware of the Stop the Spread campaign based on the `Check, Clean, Dry` guidance.
- Check out the NNSS (non-native species secretariat) website at: [www.nonnativespecies.org](http://www.nonnativespecies.org) Follow the links to see the latest news on the latest threats (such as killer shrimps). Also use this website to download and print off the Check, Clean, Dry posters that can be given to your members and be displayed at access points, car parking areas and fishing huts etc.
- If you have a club committee (or similar controlling group) appoint a Biosecurity Officer. Their role would be to monitor the threats regularly and keep up-to-date on the latest recommended biosecurity methods so you are always following “*best practice*” based on the latest sound science from the likes of the NNSS and EA (or SEPA in Scotland). Additionally, if you share a river system with other fishing clubs then they need to be contacted so you can all follow the same principles on biosecurity issues.
- If you have a club website then have a prominent link to the NNSS website so that members are reminded where important information can be found.
- If your club water is just on one still water or river system encourage your members to have one set of waders, boots, nets, boat drogues etc. that are used only on your water and not taken to other venues. This in addition to habitually following the Clean, Check Dry guidance.
- If you have several waters on different river systems then insist that all members follow the Check, Clean, Dry guidelines when moving from one venue to the next.
- Where the Check, Clean, Dry guidelines cannot be followed fully (for instance due to the amount of time that it takes to completely dry items like waders, nets and boots) then wet waders, gravel guards, nets and boots etc. can be rinsed in a large bucket (or buckets if the kit will not fit in one) of hot tap water (45°C or over) and left to bathe for at least fifteen minutes. This should help ensure, at the very least, that any larger organisms like shrimps are killed.
- Members must be made responsible not just for their own biosecurity BUT that of their guests too.
- If day tickets are issued to non-members then some means must be put in place to check the waders, boots and nets etc. of visitors and if found not fully clean and dry then some kind of approved disinfection system should be used. Different options like the use of `Vikon S` can be discussed with your local EA (or SEPA) office, however at the moment (November 2012) there is no recommended disinfectant that can be used to destroy killer shrimps – hopefully this problem will be resolved soon.
- If you allow Fishing Guides, Instructors or Gillies to operate on your waters then you must insist that they follow all biosecurity measures and that they are made responsible the biosecurity for any clients they bring along (these could be new to the sport and not yet aware of the problems and issues caused by invasive non-native species).

Anglers, like most groups, hate change but we must do so and lead by example if we are to protect our much loved sport and the waters we fish. Hopefully, with time, biosecurity will just become part of the culture and be as common place as washing your hands before handling food or putting on a seat belt before driving.

**Think carefully on what can be done, but doing nothing should not be an option.**



### **Biosecurity for Fishing Guides, Gillies and Instructors**

Here is a list of recommendations for you to consider that will help prevent you (or your clients) unintentionally transferring invasive non-native species between water courses that can, and do, devastate fisheries.

- Make sure you are fully aware of the Stop the Spread campaign based on the `Check, Clean, Dry` guidance.
- Check out the NNSS (non-native species secretariat) website at: [www.nonnativespecies.org](http://www.nonnativespecies.org) Follow the links to see the latest news on the latest threats (such as the spread of killer shrimps). Also use this website to download and print off the Check, Clean, Dry posters that can be given to your clients and to check for the latest biosecurity methodology that will be updated occasionally based on new science.
- If you have a website then have a prominent link to the NNSS website so that your clients are reminded where important information on biosecurity can be found.
- If your regular venue is just a single still water or river then have a dedicated set of waders, boots, gravel guards, nets, boat drogues etc. that are used only on that water and not taken to other venues. This is in addition to you habitually following the Clean, Check Dry guidance.
- If you work on different waters on different river systems then you **MUST** follow the Check, Clean, Dry guidelines fully when moving from venue to venue (or have dedicated sets of kit specific to each venue).
- Where the Check, Clean, Dry guidelines cannot be followed fully (for instance due to the amount of time that it takes to completely dry items like waders, nets and boots) then wet waders, gravel guards, nets and boots etc. can be rinsed in a large bucket (or buckets if the kit will not fit in one) of hot tap water (45°C or over) and left to bathe for at least fifteen minutes prior to visiting another venue. This should help ensure that any larger organisms, like shrimps, are killed. In addition, after this operation, you should use an approved disinfectant such as `Vikon S` to make sure other pathogens are neutralised (make certain that you follow all the manufacturers' guidelines on the safe use and disposal of any disinfectant type products). This two pronged approach is necessary because at the moment (November 2012) there is no recommended disinfectant that can be used to destroy killer shrimps and hot water alone may not destroy all the other pathogens – hopefully this problem will be resolved soon.
- You must not only be responsible for your own biosecurity but be fully responsible for any clients you have with you. It should be your job to check their waders, nets and boots etc. and if necessary clean and disinfect this type of kit before your day begins (these clients could well be new to the sport and not be aware of the problems and issues caused by invasive non-native species).

Anglers, like most groups, hate change but we must do so and lead by example if we are to protect our much loved sport and the waters on which you earn your living. Hopefully, with time, biosecurity will just become part of the culture and be as common place as washing your hands before handling food or putting on a seat belt before driving.

**Think carefully on what you can do, and lead by example. Doing nothing is not an option.**