

Environmental Audit Committee

Oral evidence: Invasive species, HC 2129

Tuesday 25 June 2019

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[Watch the meeting](#)

Members present: Mary Creagh (Chair); James Gray; Ruth Jones; Caroline Lucas; John Mc Nally; Dr Matthew Offord; Alex Sobel.

Questions 183 - 363

Witnesses

I: Dr Emily Smith, Environment Manager, Angling Trust, Richard Atkinson, Waterways and Environment Policy Officer, British Canoeing, Kate Hills, Biosecurity and Invasives Manager, South West Water, and Phil Brewin, Senior Environmental Officer, Somerset Consortium of Internal Drainage Boards representing the Association of Drainage Authorities (ADA).

II: Kevin Austin, Deputy Director, Agriculture, Fisheries and Natural Environment, Environment Agency, Richard Shaw, Country Director, Centre for Agriculture and Bioscience International (CABI), Sara Redstone, Plant Health Officer, Royal Botanic Gardens, Kew, and Dr Anna Brown, Head of Tree Health and Contingency, Forestry Commission.

Written evidence from witnesses:

- [South West Water - written evidence](#) | [PDF version \(100 KB\)](#) 
- [CABI - written evidence](#) | [PDF version \(85 KB\)](#) 

Examination of witnesses

Dr Emily Smith, Richard Atkinson, Kate Hills and Phil Brewin.

Q183 **Chair:** I welcome our witnesses to our third hearing in our inquiry into invasive species. We are going to look at invasive species in freshwater environments, and we are very excited to have such an eminent panel with us here today. I will begin by asking you to introduce yourselves, starting from my right. This is basically a sound check.

Phil Brewin: Good morning. I am Phil Brewin. I work for the Somerset Consortium of Internal Drainage Boards, which is a group of three drainage boards covering all of the catchments in Somerset. I am also here representing the Association of Drainage Authorities.

Chair: I have trouble hearing you. We might need to move the mic, or you might need to speak up and speak from the diaphragm. We will move the mic forward a bit. Thank you.

Dr Smith: Hi, I am Emily Smith. I work for the Angling Trust. I am the environment manager and lead on invasive species. My background is that I have done some research looking at invasive species and unintentional pathways, and spread as well.

Kate Hills: Good morning. I am Kate Hills. I am the biosecurity and invasives manager at South West Water. Our parent body is Pennon, which also has Viridor under its wing. We sound French, but we are actually British owned. We are based in Exeter, with about 2 million residents. I am also the vice-chair of the Mammal Society.

Richard Atkinson: Good morning. I am Richard Atkinson. I work for British Canoeing, and I am the Policy Officer and the lead for invasive species.

Q184 **Chair:** Great. I remind witnesses, guests and Committee members to turn all phones to silent, please, before we start. Thank you.

Can I kick off by asking how invasive species impact on your organisations' activities, perhaps starting with the water company?

Kate Hills: I am not quite sure where to start. We are large aquatic landowners. We know that aquatic species are particularly problematic. I do not think we know the full challenges that we have ahead of us yet, but we know that they affect all aspects of our business—so that is operational, compliance, regulatory and financial.

We have three core areas of work. One is clean water; that is from abstraction to transfer, storage, transfer, treatments and discharge. We have issues with waste water. This did come as a bit more of a surprise from the survey work we have done. For example, we found *Crassula*—New Zealand pygmyweed—in the sewage treatment filter beds. We have also had issues with rhododendron that is planted as a screen around



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sludge works. Badgers had burrowed under the rhododendron and lifted up the sludge plates—things we did not anticipate.

Another big core area of our work is conservation, access and recreation. We know from research that the two big pathways for invasives are angling and boating. Climate change also has an impact on our work. Invasives can take advantage of drought and flood conditions.

We have responsibilities to our customers. We had a customer review panel who said their four top things were that they wanted safe water, reliable waste service, resilience, and protection of the environment. Invasives fit into all of those categories. We also have responsibilities to our regulators—that is the Environment Agency and Ofwat—and responsibilities to our stakeholders.

It is estimated, in a piece of research by Water UK, that water companies spend £7.5 million on invasives. That is an extremely conservative estimate.

Q185 **Chair:** How much did you spend last year?

Kate Hills: It was less than £1 million, but in April 2020 all water companies start their new five-year management plans. All water companies have an invasives remit. Thames Water is looking at spending £4.7 million. South West Water and several other water companies are investing around £2 million, so those three or four companies have already exceeded that £7.5 million target.

Q186 **Chair:** Thank you. That is very helpful. Mr Atkinson: canoes—it is your members that are spreading this stuff around.

Richard Atkinson: I am not so sure about that.

Q187 **Chair:** You would say that, wouldn't you?

Richard Atkinson: There are 1.9 million people paddling in the whole of the UK and at many destinations abroad. People paddle for a number of different reasons: their health and wellbeing, the enjoyment of the natural environment, endurance, the thrill of white water, and even fishing. There is also the competitive side; our GB slalom team did very well at the latest world cup. We got four golds, two silvers and a bronze.

Q188 **Chair:** If we can we talk about invasive species rather than medal glory, that would be great. How do invasive species impact on your activities, and what are your responsibilities for managing them?

Richard Atkinson: BC recognises that this is having a major impact on our inland waters, mainly through the clogging of our waterways, the canal systems and the slower reaches of rivers. It is not just impacting on the paddling community, but on many other water-based recreational users, which is obviously having a high cost implication on organisations such as CRT and the Environment Agency. We are tackling it in a number of ways in the freshwater environment. It is one of our top priorities in



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maintaining and protecting our natural environment. We are promoting awareness of invasive species to our membership and the wider paddling community.

Q189 **Chair:** How do you do that?

Richard Atkinson: Through the development of environmental modules within our coaching system at different levels, and different levels of environmental information. This will hopefully impact on and influence new paddlers coming into the sport and seasoned paddlers that want to improve their skill levels and their knowledge of—

Q190 **Chair:** You say you are developing them. Are they complete?

Richard Atkinson: No, they are not.

Q191 **Chair:** Therefore, you have not done any training for coaches up until now?

Richard Atkinson: Yes, we have.

Q192 **Chair:** What have you done?

Richard Atkinson: We have launched the paddler support leadership guide scheme, which teaches leaders taking people out—commercial use and so on—about environmental issues and sustainability. That includes things like ensuring paddlers paddle sustainably in protected areas and ensure they carry out biosecurity—check, clean, dry—where they can, and a whole range of different environment information.

Q193 **Chair:** What do you mean by “where they can”? Surely it has to be something that happens every time?

Richard Atkinson: It is difficult, because paddlers do paddle in remote areas, in different catchments on the white water. So it is quite difficult to move and to use biosecurity when they are in a very rural, remote area.

Q194 **Chair:** Isn't it too late by the time they are in the rural area? Surely the time to check the canoe—

Richard Atkinson: We do urge them to clean the boats before they go on any form of water.

Q195 **Chair:** Right. You urge them, but if they don't, they can still go on?

Richard Atkinson: Yes, but we need to urge people to clean their boat before they enter any watercourse.

Q196 **Chair:** What is this module on invasive species, then? When will that be complete and rolled out?

Richard Atkinson: It is hopefully going to be rolled out by the end of this year.

Q197 **Chair:** To how many coaches?



Richard Atkinson: Roughly 800 to 1,000.

Q198 **Chair:** They are the people that you train every year, or they are the people that you already—

Richard Atkinson: Yes. They take part in the courses that British Canoeing—

Q199 **Chair:** What about the people that have already been trained?

Richard Atkinson: We also have a lot of web-based information on our website, and we have quite a bit of e-learning related to environmental sustainability as well. Anybody can access those.

Q200 **Chair:** What level qualification is this new module? Is this a level 1, a level 2?

Richard Atkinson: It is going to be level 1. I am not an expert in the coaching system, I am afraid. We have just changed to the personal performance awards.

Q201 **Chair:** If you could write to us with some more detail on that, that would be helpful. Thank you.

Richard Atkinson: Yes.

Q202 **Chair:** Dr Smith, the Angling Trust. Your members, too, are putting their rods in the water. What steps are they taking? How does this impact you?

Dr Smith: Again, just for a bit of background, about 4 million anglers or people went fishing in the last two years. Angling contributes £3.5 billion to the economy every year. We have a large volume of people going out enjoying fresh water and marine.

From the side of impacts, from a fresh water perspective, it varies between areas, because you have some species that affect, say, slow-moving waters more than rivers. But for us, in particular, the key one is crayfish because they come in, and they can prey on fish eggs and juveniles up to fish of three years in age. So you are having that recruitment loss throughout rivers. Another one is floating pennywort.

Q203 **Chair:** How does that affect you?

Dr Smith: There is a rather famous photo that goes around of a sheep that has entered the water because it has assumed that it is land, basically—the water is that dense. Just think how dense that is when you are trying to get your rod in—it is just impossible. It cuts out light, so it is affecting the insects, the natural flora, and, again, that has a knock-on effect on fish.

There are numerous other species, such as killer shrimp, which is very aptly named because of its impact in predating on fish eggs and other invertebrates—it is very aggressive. So there is a whole host of species



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that we have here that impact on anglers, as well as some that we do not have yet that are knocking on the door in Europe, ready to come in.

Q204 **Chair:** What are you worried about?

Dr Smith: The ponto-Caspian species. These originate in eastern Europe, and as channels for shipping have been opened up, they have been moved up, so, now, quite a lot of them are in western Europe, in the Netherlands. And then there is a lag; David Aldridge, who you have spoken to before, has done some research that shows about a four-year lag from them being in Europe and then coming into the UK. There are some fish—cobia species—that we are particularly concerned about, as well as more invertebrates.

Q205 **Chair:** Can I just ask: what are your biosecurity recommendations? How do you get them out to your members?

Dr Smith: We chair the angling pathway action plan group, so we are doing a lot of work with anglers on the ground to encourage them to check, clean, dry, and to make sure that they do that every time they go fishing.

We have done stuff with international competitions. Last year there was a World Lure Championship. Before anglers came into the UK from abroad, we wrote and translated the check, clean, dry into 11 different languages. We gave that to them before they even set foot on soil, to encourage them to make sure they had checked, cleaned and dried their equipment before they came.

All of our staff have to take e-learning on invasive species, and that is also for our volunteers and our coaches. We have that in there, and then they can go out on the ground and spread the word. There are also lots of different kinds of guidance and things out there for fisheries, volunteers and anyone who is working on water, anglers, basically—

Q206 **Chair:** How many of your volunteers and coaches have undertaken e-learning?

Dr Smith: All of our staff have to, and we have a target at the moment of about 50% to try to do it, but we are encouraging it all the time, and that is something where we are trying to put pressure on.

Q207 **Chair:** That is 50% by when?

Dr Smith: At the moment, that is the figure that we have and—

Q208 **Chair:** For volunteers and coaches?

Dr Smith: Yes.

Q209 **Chair:** Your target is 50% by 2020, 2050?



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Dr Smith: That is our target at the moment, as in that is how many we have already that have done it. Beyond that, we want to increase that value.

Q210 **Chair:** To what?

Dr Smith: Ideally, 100%. That would be the one that I would want to see, because it is very important. They are the ones on the ground who have to go out and know about invasive species if they get asked.

Q211 **James Gray:** Very quickly, you said 4 million people fish, or 5 million or thereabouts. Do all have fishing licences or not all?

Dr Smith: No. That includes marine, so sea anglers.

Q212 **James Gray:** How many would have fishing licences?

Dr Smith: I think it is 1.5 million—of that order.

Q213 **James Gray:** How much are they each?

Dr Smith: I do not know the latest figures off the top of my head.

Q214 **James Gray:** You do not know. All right. It used to be about 20 quid, wasn't it, roughly? *[Interruption.]* It was £27, was it? So that is £50 million a year raised from fishing licences. That goes to the Government. What do the Government do with it?

Dr Smith: We get some money back from rod licences from the EA, so my position is funded from rod licence money. They give some of that back to our alien attack project. So there is a lot of work. Some of it goes to invasives; some of it goes to—

Q215 **James Gray:** Just in passing, if the Government is earning £50 million or something—that figure is to be agreed—from rod licences, is there not an argument that the Government should be taking a more active part in biosecurity?

Dr Smith: Yes. A large proportion of that money could go towards invasive species, but recognising that there are other stresses as well on the environment—pollution and all that kind of stuff—so yes.

Q216 **Chair:** Mr Brewin?

Phil Brewin: Thank you, Chair. Drainage boards are local authorities that operate in low-lying areas in England. We manage water under permissive powers for the purposes of flood risk management, drainage and environmental protection. Also, of course, we have a duty to protect the natural environment, and the specific duty to protected areas.

The invasive species can impact our operational practices. Nationally, we maintain around 22,000 km of water course. Within Somerset, that is about 650 km. Within those areas, we include sluices, pumps and other weirs. If we get very significant growth from plants like floating



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pennywort, that can cause extra maintenance, burdens, additional costs and costs in terms of waste disposal.

I have not been able to quantify what that cost is for drainage boards, but, by way of example, the Environment Agency in 2017 spent around £500,000 removing over 1,000 tonnes of floating pennywort and plants like—

Q217 **Chair:** In your IDBs—in your job?

Phil Brewin: No, that was across England. Within our area, we do have that particular plant. It is a plant of great concern because it is very persistent. It does originate from tropical areas, so it is a plant—

Q218 **Chair:** Is it everywhere now?

Phil Brewin: No, it isn't. It has been in the country for less than 20 years. It has become established in some areas in the east, which is where it was first introduced. It has now found its way to Somerset, and we recognise the very high risk associated with that. We are working with our local partners—in particular, the Environment Agency and Natural England—to develop a control programme.

Q219 **Chair:** This is about flooding—flood risk prevention?

Phil Brewin: Yes, it is about flooding, but there are also very significant environmental impacts. As Emily has just mentioned, it can out-compete native plants and animals, and it can form a very effective barrier on the surface of the water, which can change the chemistry and exclude light from the watercourse, which obviously impacts.

Q220 **Chair:** How many miles of your network are affected?

Phil Brewin: Currently, we have four patches in the Parrett. The most significant one is on the Tone. That must be about 5 km in total. There is also an outbreak near Western-super-Mare that is spreading through the ditch system, which is a great concern for us because of the rural flood risk that that poses.

Q221 **Chair:** What are you doing about it?

Phil Brewin: We are implementing biosecurity procedures. ADA has developed a template for all drainage boards in the country. That includes making operators aware of the risks and putting in place procedures for cleaning and drying machinery. For other species, like, for example, zebra mussels, we need to thoroughly clean the machines, including steam cleaning, which is an additional cost to us.

Q222 **Chair:** You are advising people to keep their machinery clean when they are going and doing dredging, but if they do not follow biosecurity, you have no powers to enforce compliance?

Phil Brewin: No, we don't. There are a number of authorities that manage water within our area. There are private landowners who



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maintain their own private ditches as well. What we are trying to do, in Somerset in particular, is raise awareness of the issues, using tools like social media to get information out to farmers to make them aware of the problems. The response is usually quite good. They can provide us with up-to-date information on monitoring, and some will undertake control measures as well.

Q223 **Chair:** But you are just relying on goodwill?

Phil Brewin: We are, yes. There isn't a great deal of funding for invasive species control. We are generally funding it out of our normal maintenance budgets.

Q224 **Chair:** We have heard evidence that any control or eradication measures that stop short of complete eradication are likely to be money down the drain—if you will pardon the pun—because the target species will quickly recolonise. If you were a farmer, and you read the research, what is the point of trying to control it?

Phil Brewin: That is a very important point. It shows the need for a sustained and continuing programme of control. Certainly, where we have aquatic plants, with different landowners on either side of the watercourse, that can make additional complications, because they will own up to the centre line of the watercourse and, in many instances, there can be a large number—even hundreds of landowners—involved in the process.

Q225 **Chair:** We had the example, when we were in Cambridge, of the gulf wedge clam—

Phil Brewin: Yes, in Lincolnshire.

Chair: It was spotted in one of your drains, as a small issue, and it is now over 10 km, so what has happened there? Why no action? Why no eradication? Are you just going to let it spread throughout East Anglia?

Phil Brewin: Well, no. I do know a little bit about this, and I believe that it is actually within an Environment Agency drain. It is within a drainage board district. It is quite a—

Q226 **Chair:** Are you saying it is in an Environment Agency drain?

Phil Brewin: I believe so. I would have to—

Q227 **Chair:** The agency has not eradicated it?

Phil Brewin: It is taking measures to identify the best means of control. It is a new species to this country. Some of the work is being done with Cambridge University looking at taking samples of the DNA, so that we can use remote sensing to determine where else this clam might be—it is not an easy thing to survey. There is also work looking at a bio-control that is species-specific that can kill this clam. The problem, of course, is it is often quite difficult to apply within a flowing watercourse. Therefore, it is unlikely we will be able to eliminate it completely, but—



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Q228 **Chair:** Surely it could have been eliminated in 2015, when it was only over half a mile or a mile, and now it is over six miles, so it is going to be six times harder, isn't it?

Phil Brewin: Absolutely, and this is a key lesson: early intervention and a thorough treatment programme are an investment that will save us money in the future.

Q229 **Chair:** This is the south 40-foot drains in the River Witham, in Boston? Our information is that it was unused for 40 years and was reopened in 2009. So that is an EA drain?

Phil Brewin: I believe so. I cannot confirm it, but that is what I was—

Q230 **Chair:** No, it is not. The Black Sluice IDB maintains the water levels. The EA provides licences for navigation, so it is one of your members that is responsible.

Phil Brewin: Okay, right.

Q231 **Chair:** What is the answer from one of your members?

Phil Brewin: I have just told you what—

Q232 **Chair:** You are aware of the problem—

Phil Brewin: I am.

Q233 **Chair:** But you are unaware that it is one of your members—that is actually responsible for eradication—that has sat back for the last four years and let this species take over.

Phil Brewin: We have permissive powers that allow us to undertake works for flood risk management and environmental protection. I do not think we are specifically responsible for eradicating invasive species.

Q234 **Chair:** Isn't environmental protection one of your public duties?

Phil Brewin: It is, yes.

Q235 **Chair:** So wouldn't eradicating an invasive species be full, smack, firmly in the definition of environmental protection?

Phil Brewin: Well, yes and no. We are undertaking those activities with the resources—

Q236 **Chair:** But this one wasn't. One of your members has not done anything on it for four years.

Phil Brewin: Sorry, I cannot say any more, because I am unaware of specific actions regarding that species.

Q237 **Chair:** Okay. From your body, who has oversight of the environment activities of your members?

Phil Brewin: It is DEFRA and the Environment Agency.



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Q238 **Chair:** How would they exercise that oversight?

Phil Brewin: We work as closely as possible and—

Q239 **Chair:** Has the Environment Agency ever forced you to do a particular clean-up of invasive species?

Phil Brewin: I don't believe so, no.

Chair: All right, thank you very much. We will move on.

Q240 **John Mc Nally:** First of all, Mr Atkinson, you might be aware of one of my local constituents, Sophie Ogilvie, who won a gold medal at the European games. I have known her since she was a wee girl, and she is an extremely talented, highly successful young lady. I never thought I would get to speak about her, so thank you for reminding me of that.

I want to move on to the tackling of invasive species themselves. We have heard that the catchment level approach is most effective when dealing with invasive species in fresh water systems. Are the Government doing enough to co-ordinate activities at this scale, and could the Government learn from the partnership approaches to funding and project implementation used by the Scottish Government's invasive species initiative?

For example, Chair, the £3.34 million project covering one third of Scotland's mainland land mass is funded for four years until 2021, with a view to establishing voluntary local initiatives to combat invasive species in the long term, so there is real action going on here. In your opinion—perhaps Phil could start—are the Government doing enough to co-ordinate activities at this scale?

Phil Brewin: I would agree that it is very important that we do act at the right scale. Different authorities—in particular, drainage boards—only operate in low-lying flood plain areas, so we are unable to cover the whole catchment.

One of the best approaches that we perhaps have is developing and supporting local catchment partnerships that bring bodies together and other organisations as well, including environmental NGOs. Those sorts of bodies would be an appropriate mechanism for developing a more strategic catchment approach to invasive species control. The big challenge, of course, is raising the funding and sustaining that funding in the long term.

Q241 **John Mc Nally:** I suspect it is a challenge that you do not need when you are trying to raise funding.

Phil Brewin: A particular issue is where funding may be available for a short number of years or for a specific project, when it really needs to be part of the daily routine to avoid future costs.

Q242 **John Mc Nally:** Could you comment on that, Dr Smith?



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Dr Smith: Yes. The work, historically, has been quite piecemeal. There have been some really great initiatives that have gone on. My colleague here, Kate, in the South West Forum, has lots of enthusiastic people all coming together joining up to tackle invasive species. There is another one in Yorkshire and another one in Norfolk, but these are based on the will or enthusiasm of individuals. There have been some other cases. There is the Source to Sea Project. So the idea is recognising a more strategic approach and trying to manage it, from the top all the way down, to eradicate a species. However, although they have done great work in a short amount of time, funding dries up, so, unfortunately, they do not end up doing what they set out to do.

Q243 **John Mc Nally:** You can see a longer term commitment?

Dr Smith: If there was more sustained funding, that would be quite an important thing.

There is now the RAPID LIFE EU project, which I think you have heard about in previous panels. They have these regional invasive management plans. There are five of them in England. That is a new programme that is bringing a lot of different stakeholders and interest groups together to try to prioritise which species are a problem in those regions and then to try to encourage action. Again, you need funding to make sure that is sustained. Also, that is only up to 2020, so making sure that that is continued is a real issue.

Kate Hills: Scotland is doing some exemplar work on control. You have the Outer Hebrides mink control project and the Cairngorms mink control project.

Catchment work is an obvious unit when you are looking at aquatic control, but you do need to look beyond that. I think you need to look regionally. We have scoped what we have on our sites, but we need to know what is in our region and what could come in on to our assets. Things can cross regional boundaries, and with the raw water transfer proposals, you need to look between regions as well. So water companies are talking nationally. We have a great camaraderie, and we are sharing information.

South West Water has set up an invasive water company forum. Yorkshire Water set up an e-mail system so we can all talk. Anglian Water is developing e-learning for water companies, and Welsh Water produced an original report about the problems coming in. Therefore, you need to look at your smaller units, but you need to think about the bigger scale as well.

Richard Atkinson: British Canoeing relies on its many volunteers to do a lot of the key work when it comes to non-native species and reducing plastics from our river systems. We have produced some real, tangible results. We have been working with Surfers Against Sewage on the Big Spring Beach Clean: Summit to Sea. We have removed nearly 13,000 kg



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of plastics, which was collected by just under 8,000 volunteers. These same volunteers are passionate about doing other environmental work, such as non-native species removal.

We have set up a partnership with the Canal & Rivers Trust to look at removal of floating pennywort on a catchment basis. It is fairly local at the moment, but we are hopefully going to escalate that up to a national programme. We are working with canoe club volunteers to physically remove Pennywort from CRT waters before it gets too much to cope with. We have been very successful in that.

Chair: Where is that?

Richard Atkinson: That was at Dewsbury, on the Aire and Calder canal.

Chair: Very good. Hopefully you will come down to Wakefield soon.

Richard Atkinson: We are going to Wakefield on Friday, to Stanley Ferry.

Chair: What a shame, I won't be there.

Richard Atkinson: We are going to Stanley Ferry on Friday, and we will be moving over to Hyde on the Peak Forest canal as well.

Chair: Brilliant, very exciting.

Richard Atkinson: We are going to promote these on a national basis and—

Chair: Next time, invite the MPs along.

Richard Atkinson: There is an MP coming to Peak Forest.

Chair: I do not remember seeing an invite to that, but never mind.

Richard Atkinson: As to the other things we are doing, we are working with the North Wales Wildlife Trust at a number of our events. In 2018 a number of canoe, polo and white water events were held at the National Water Sports Centre, with 500 people, at least, taking part in the events. We were demonstrating biosecurity—check, clean, dry—to these competitors, who do not come across check, clean, dry very often.

This year, we are looking at attending events—the five sprinter regatta events—where there are going to be 3,000 to 4,000 people taking part. Again, we are going to be working with the Wildlife Trust to wash down boats, and supplying various invasives information.

We have put permanent check, clean, dry signage at all our British Canoeing-owned sites, and we have installed a permanent wash-down facility at one of our sites on the River Washburn.

Q244 **John Mc Nally:** I think we are going to come on to that question later on from one of our other members.



Richard Atkinson: All right.

Q245 **John Mc Nally:** Could we move you on to the Government's approach? Is it effective at tackling invasive aquatic vegetation, such as—something I had never really heard of before—floating pennywort and how it can be removed? My own particular interest was in giant hogweed and Japanese knotweed, which was a particular concern along the tributaries along the River Cairn and the Forth and all of the areas around there, which a lot of the canoeing started in my own area. Could you tell me if the Government are doing enough to tackle this?

We removed 736 km of giant hogweed. It was treated, and 195 volunteers assisted with that. With mink removal alone, there were another 537 volunteers in total. We are hoping to increase that this year. They are funded through officers that are directly employed through the various partners involved in the funding, and I just want to know how things could be improved at this moment in time. I think you mentioned earlier that this is not going to go away; it is only going to get worse. If your funding is only for another year, it is kind of scary. What is ahead? Mr Brewin, would you like to start off again, please, with that question?

Phil Brewin: I would like to add that it is very valuable having volunteer effort, but the water environment can be quite a hazardous place to deploy volunteers, so that does need to be managed with extreme care. Giant hogweed is a poisonous, injurious plant as well, so we do need specialist input to control programmes.

I would also like to highlight the way that invasive species can take advantage of weakness within control programmes. If there is land that cannot be accessed, or effort does stop—we have said this already—we very quickly return back to an earlier state where the plants or animals can return very quickly.

The answer is to have a more catchment-wide strategic approach to control, to develop plans locally with partners, and to try as best we can—if we cannot raise the money nationally—to raise it locally. For example, in Somerset we have a new organisation called the Somerset Rivers Authority, which does bring partners together and is able to raise money locally for, in particular, flood risk management activities. Given the relevance of invasive species to flood risk, we might be able to raise local funds as well as draw on national funds.

Q246 **John Mc Nally:** I suppose the question is: is everybody actually talking to one another? We had an example from Dr Paul Walton. In the 1980s, Glasgow decided to get rid of the giant hogweed by spraying Roundup, and then they did not take it any further. It just ended at the city boundary. You think that, hopefully, we have managed to improve a great deal since those days. Would you like to comment?

Dr Smith: The question is in relation to management?

Q247 **John Mc Nally:** Yes, I meant management of it—working together.



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Dr Smith: I think, for certain species, there is quite a lot of good work going on. You have heard about the Asian hornet previously, and then there is work on water primrose and topmouth gudgeon, so, on certain species, we are very good at co-ordinating and trying to get rid of them. In other cases, such as floating pennywort, unfortunately, in the past those involved have been quite slow to respond.

They are getting better, and there is more guidance out there now, but there is less of a strategic approach. I think it is very species-specific and about what they can get money for and what the priorities are, when, actually, if you invest to begin with and try to get rid of it, it is so much more cost-effective in the long term.

Q248 **John Mc Nally:** Basic prevention is better than finding a cure, isn't it?

Dr Smith: Yes.

Q249 **John Mc Nally:** Would you like to comment on that?

Kate Hills: The simple answer is, no, there is not enough being done to fund management projects. That is at the Government level and down. The GB Non-native Species Secretariat has a key role in co-ordinating this work. To have effective control, you need to be strategic, collaborative, and co-ordinated at the right scale, with the right resource.

There are some exemplar examples: the Environment Agency with topmouth gudgeon. The plants are hardy. They have seed banks that they disperse at a wider rate than others, potentially, so it is very difficult. It needs a partnership approach, and no one sector is responsible. All water users and others need to be doing this.

The local action groups do some brilliant work, but I worry that it is not necessarily at the top of the catchment, moving down; it is more piecemeal, which means it may not be worthwhile. It needs a much more strategic, co-ordinated, resourced approach.

Q250 **John Mc Nally:** You feel that the energy that people are willing to put in is just a bit unco-ordinated—

Kate Hills: Did you say just in recording it?

Q251 **John Mc Nally:** Not just in recording it. If you have people that are willing to give up their time in man hours—or woman hours, which is what they say nowadays—that energy has to be put into the right place, and it needs to be co-ordinated by professional people who know the size of this and what they are actually talking about, but you are saying there is a gap there at this moment in time?

Kate Hills: Yes, co-ordination and support is critical, but it is the long-term scale of the problem that is the issue. Some water companies fund projects through their upstream thinking projects or their catchment projects, but a lot of water companies, including South West Water, Welsh Water and Yorkshire Water, are looking at setting up in 2020



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specific grants to help people go out and do this, so that we can have some kind of strategic element to the work that needs doing.

Q252 **James Gray:** We have heard—and you have answered quite a lot of this already—that a significant part of the pathways through which invasive species enter our waterways come about as a result of recreation. On fishing, there is less that we can do, so I want to focus for a moment back on canoeing. When you go to a public swimming pool for a swim, you have to have a shower beforehand, as well as, very probably, having a shower when you get out. Why, then, is it that you can turn up with your canoe and put it in the water with no scrubbing? You only scrub when you leave the water rather than enter it.

Richard Atkinson: No. We tell people to clean their boats before they enter.

Q253 **James Gray:** Do you?

Richard Atkinson: Yes.

Q254 **James Gray:** That is not what we heard from Dr Dunn, who says she is absolutely astonished by the fact that there is no requirement to wash down when you enter the reservoir, only when you leave it.

Richard Atkinson: I am not aware of that at all. Our policy is: we follow DEFRA's check, clean, dry procedure to the word, really. We demonstrate check, clean, dry at a number of our events, as I mentioned earlier.

Q255 **James Gray:** I want to focus simply on this question of wash-down. As an organisation, you are clear that your members wash their boats off both as they get into the water and as they come out. Is that correct?

Richard Atkinson: Our policy is to tell them to do that. We cannot police what they do.

Q256 **James Gray:** You can at major events, can't you?

Richard Atkinson: Yes, at major events, and that is what we are doing. We are promoting check, clean, dry, but if you are going—

Q257 **James Gray:** Let's focus on what you can police. Quite plainly, you cannot police me in my private pond, but, in your major events that you run and other things, do you ensure that all canoeists wash down on entering the water as well as on leaving?

Richard Atkinson: At events, yes. That is basically what we try to do.

Q258 **James Gray:** You police that?

Richard Atkinson: We haven't covered all the events. We are still in our infancy with looking at performance and competitive events. It will take time to get the message through to paddlers.

Q259 **James Gray:** You have quite a large number of people taking part in the Devizes to Westminster race, for example, or things of that kind—in my



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constituency.

Richard Atkinson: Yes.

Q260 **James Gray:** In order to do that, you are going to need a very significant wash-down facility.

Richard Atkinson: Yes.

Q261 **James Gray:** Who pays for that?

Kate Hills: Can I come in? A lot of people are talking about biosecurity. I do not think a lot of people know what it means. The public has just got used to the term "biodiversity" and now we have introduced this rather dull new subject. It is being talked about. It is not being done properly. For events and asset protection, the onus has to come back to the landowner. Water companies are looking at a range of biosecurity measures, and that does include wash-down facilities.

This year South West Water is aiming to build the first pre-wash-down facility, and other companies will no doubt follow, but it is a bit like reinventing the wheel. No one has actually done that in Britain yet. I have no template or guidance to follow. New Zealand is the world leader in this, and I have argued with my line manager that I should be going to New Zealand for site visits.

James Gray: I would like to come and join you on that.

Kate Hills: There is nothing like face to face. You need to be there. They are not having it, so it is a really hard process.

Again, it is back to the water companies talking to each other. We have a coalition through—

Q262 **James Gray:** It is not about talking, though, is it?

Kate Hills: It is sharing best practice.

Q263 **James Gray:** South West Water has more beaches than anybody else, and a significant part of the higher-than-average water charge that you make in South West comes about through your responsibility to clean up the sewage from the beaches. Now, to a very significant degree, that has occurred along sea outlets and all that stuff. The same, surely, will apply here: if it is the water companies who have the responsibility to provide the wash-down facilities to a very large number of sites where there will be canoeing. You are talking about a very large amount of money, and it is going to be the water customers who will end up paying for it.

Kate Hills: It will, and because of the impact on operations and the regulations, it is something that will have to be done. I forgot your question, sorry.

Q264 **James Gray:** We are talking about who pays for wash-down facilities. If it is the water companies, will they actually do it, and will Ofwat take



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account of the cost in setting the price for the next internal review?

Kate Hills: We do have to do it. It is working out how to do it. How many boats or fishing people do you get to an event? How much water do you need to wash that down? Have all the sites got hot water? What do you do with that contaminated water? How big a sump do you need to collect that? You can filter out the big bits, but how do you treat the little bits and the rest of it? Then, what do you do with the rest of that water? It is a huge thing. We need to talk about it and we need to learn. It will come in. Biosecurity is always about reducing risk, so it is prioritising our key sites, the key species and the key events, which are the big events, and it is a huge learning curve.

Q265 **James Gray:** We are not focusing down really. You came close to focusing down a moment ago. Given that there are very large numbers of sites where we have canoeing and fishing events on boats, and given that we have now heard that we do in fact wash down both on entering the water and leaving it, apparently—

Kate Hills: We will.

James Gray: I was surprised to hear that. Also, given that this is an enormously complicated thing to do, as you described, with sumps, hot water availability and all that stuff, you are talking tens of millions of pounds across Britain to do this, aren't you? It is going to be an enormous operation.

Kate Hills: Potentially, yes, but the investment now is enormous. Thames Water spent £1 million alone on controlling mussels and may never get rid of them, so the investment there—

Q266 **James Gray:** Yes, hang on, we are not talking about controlling mussels; we are talking about the wash-down facilities and who is going to pay for that. You seem to accept that it should be the water companies that pay for it. Isn't there an argument that they will say it should be the Government, local government or the users? Are you accepting that South West Water will pay for the wash-down facilities in the very many canoe sites across the south-west?

Kate Hills: As the landowners, I think it is our responsibility. If the Government would like to support that, fantastic, but we rely totally on the stakeholders and the recreational users to support the facilities we put in and check, clean, dry. We do have problems with canoeists and anglers because we have multiple points and sites. They may not necessarily use the facilities before they go on and after, and that is something we have to work with—awareness and responsibility for check, clean, dry.

Chair: We are going to move on. Thank you.

Q267 **Ruth Jones:** We have heard a lot about the check, clean, dry campaign already. In terms of your particular areas, do you think the Government have done enough to support and raise the profile of this particular



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campaign? If yes, then that is great. What have they done in your area? If no, what do you think they should be doing in your area? Perhaps I will start with Mr Atkinson.

Richard Atkinson: It is a difficult question, really. I am part of the DEFRA boating pathway action plan group. We seem to be working quite well together identifying the pathways. Hopefully, we are going to identify how we are going to stop movement of invasives from abroad. I cannot add much more to that, I am afraid.

Q268 **Ruth Jones:** In terms of the actual check, clean, dry campaign itself?

Richard Atkinson: I would say it is well promoted. We certainly promote it extensively within British Canoeing.

Q269 **Ruth Jones:** It is interesting, because, obviously, one of our previous witnesses has interviewed some of the canoeists, and they found that only 20% of the recreational canoeists knew about the campaign, so I just wonder how you are working with the Government to raise awareness.

Richard Atkinson: It depends which recreational paddlers you have talked to. We do not cover all paddlers in the UK. There are 1.9 million paddlers. Of those, nearly 500,000 go out once a week. Our membership is 38,000 individual members, and we have 400 affiliated clubs with that, so it is still covering only a small percentage of total numbers of paddlers within England and Wales. We are making efforts to increase membership, to get information out there on our website to people that are not necessarily members of British Canoeing.

Q270 **Ruth Jones:** My question is probably more about how the Government are supporting and helping to raise the profile, but I hear what you say. I will move on to Ms Hills.

Kate Hills: The GB secretariat is doing a great job promoting check, clean, dry, but they are under-resourced. They need more resources to do it bigger and better. There is a coalition of eight water companies funding biosecurity and check, clean, dry. We have revamped the materials, and we are trying to make it more active and pertinent to target groups.

We know from the secretariat research that understanding of invasives and check, clean, dry has gone down in the wider audience but has increased with target audiences, like anglers.

RAPID LIFE under APHA has a biosecurity accreditation scheme. It has been trialled in the south-west, which is really exciting. I think that needs to go wider afterwards. We need someone to pick up the mantle, fund that and be the inspectorate for that. Biosecurity is dull, so in Devon we have carved a 6-foot crayfish waving its claws and saying, "Hey, remember us? Biosecurity is about keeping us in and keeping us out." You have to try and make it fun and interactive and to get the water



users engaged. The water company coalition is important in delivering this, and that regional approach is important, so more can be done by all of us.

Q271 **Ruth Jones:** Thank you. Dr Smith?

Dr Smith: From our point of view, we have been monitoring the awareness in anglers. Since check, clean, dry launched, the number of anglers who are considered low risk—so, cleaning and drying their equipment—has doubled from 21% to 47% in the survey last year. It is showing that that message is getting out there, but, as was previously said, it is not always completely attached to the check, clean, dry. So using that as a sole predictor, I think, can be an issue, and actually asking people if they have heard of invasive species and about what they are doing—their behaviour changes—is a better way to measure that.

With the limited resources people have had so far, the message is getting through, but I think the marketing ban hasn't been very helpful. That means that they are quite restricted sometimes in getting leaflets and signs out there. We have had great support from the water companies. That has meant there is more money available to try to get it out there, and that has been a great help.

There are now signs at ports as well for anglers—it is just that visual reminder. There are signs at fisheries and all that kind of work. There is a lot of stuff going on, but that is only with the small amount of money that people have had so far. In order to target the general public and other recreational users—we are only talking about anglers and boaters here, and there are so many other groups—there is definitely a lot more money that is needed to spread the word a lot more.

Q272 **Ruth Jones:** Thank you. Mr Brewin, do you have anything to add?

Phil Brewin: Yes, thank you. Obviously, as an industry, we are very supportive and well aware of the campaign. What I would like to add is that, in our experience, there are many other pathways to invasive species introduction. Most of ours appear to be associated with releases from ponds or aquariums, and most of the species have been present in the environment for many decades. We are adopting a risk-based approach to identifying those that are emerging—very high-risk species like floating pennywort and water primrose—and trying to target those through our operations.

Q273 **Ruth Jones:** Thank you. Back to the check, clean, dry campaign, and to Dr Smith and Mr Atkinson, what specific challenges do you face in raising awareness? You have already alluded to some, but are there any specific things?

Dr Smith: It is, again, funding and resources. There is only so much we can do. We try as much as we can to utilise the people that we have already to try to spread the word. It is just getting out to the people who do not know; it is trying to reach them. So it is about more resources and



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funding going into that, and different mechanisms. If you think of TV programmes or a thing like that, you can get the message out there. So it is just different approaches to what we have already. I think that is a big challenge.

Once you actually start talking to people, and I have had conversations with a number of anglers about invasive species, they are really knowledgeable and they care a lot about their environment. As soon as you start having those conversations and it clicks, "Oh, that species. That is invasive. Oh, it affects me this way," they become the promoters themselves in telling their friends. I think it is one of the things where, if you just have a little bulk funding to try to get the word out there, it will spiral. If you think of plastics and the changes that has had, for example, I think there is a real potential that they could have that behaviour change, so yes.

Kate Hills: Could I add that it is about making it evidence-based? You need the research behind it to say what the implications are and why it is going to affect that target user group, and to make it relevant to them and easy for them to do. South West Water and the Environment Agency are funding a PhD on biosecurity measures with Leeds University. We want to present people with information that shows how we are helping them to protect their own environment and making it fun.

Q274 **Ruth Jones:** Thank you. Mr Atkinson?

Richard Atkinson: As I said, we rely on our volunteers a lot to disseminate the information we give them. We have been training quite a few of them up to go out into the wilderness and preach check, clean, dry, biosecurity and so on. We have been working in partnership with the Wildlife Trust to deliver that training, and that has been very effective in the past in getting it out to the wider paddling community. I am trying to think of something else.

Chair: We will leave it there. Some final questions from Caroline.

Q275 **Caroline Lucas:** I want to talk about water transfers. My first question may be for Kate Hills, if that is okay. We have heard that there will obviously be a greater need for water transfers in the future, but where do you think the balance lies between allowing those transfers to take place and limiting the spread of invasive species?

Kate Hills: All raw water transfers are regulated by the Environment Agency. It has strict guidelines to work within and compliance activities to take with it. This is a new area that all water companies are going to look into in the next management plan. We are doing some very detailed risk assessments about the problems and the potential solutions that could be put in.

I am not aware of the problems at the moment or of the solutions. We do not do huge amounts of raw water transfers in the south-west, but for the south-east, where they will have water shortages—due to the higher



population and climate change elements—more work is needed there. It is very challenging and very exciting.

Q276 **Caroline Lucas:** Dr Smith, do you want to add anything on that?

Dr Smith: This is in relation to—

Caroline Lucas: To water transfers and the balance between the need to make transfers, on the one hand, but the risks of spreading invasive species at the same time, and the costs of trying to avoid the latter.

Dr Smith: Yes. I recognise it is a big challenge that water companies have to try to make sure that we have resilient systems going forward with climate change and increased drought in certain areas. However, it is highly complex. We have the issue of invasive species being moved, but also the issue of water quality and understanding, if you are moving water from one section to the other, what potential impacts that could have. It is a big challenge. There should be a risk-based approach, and more research needs to be undertaken in the area before we can fully understand what the consequences could be. That is my input there.

Kate Hills: Would you like me to expand on what we are looking at in the raw water transfer risk assessment?

Caroline Lucas: Yes, thank you.

Kate Hills: We are looking at the connections, the locations and the habitats they are going through—if they are designated—the frequency and length of the transfers. Are there natural barriers? Are there screens we can put in? We are looking at how we treat and store that water, existing and new connections, and how we discharge the water.

Wessex Water has come up with a very clever matrix that is looking at the plants that could be spread by it—pieces of plant or plant fragment, or riparian species, as well as species that attach to eggs or fish, for example, and then the free-floating things. We have complicated matrices on how to look at that.

Yorkshire Water is funding a PhD post with Leeds University on the risks and the potential mitigation measures for that. At this moment, it is an investigatory approach. It is difficult to give more concrete answers.

Q277 **Caroline Lucas:** Am I right that, at the moment, untreated water transfers are permitted, but we might be looking at something in the future that suggests that it is only treated?

Kate Hills: Yes. They are regulated by Environment Agency, and that can be within a catchment, between catchments or within a region, but the big issue, I understand, is when it is across regions, which will be helping to support the south-east with their water needs. From my early understanding at this stage, it is looking like they might transfer treated water rather than raw water.



Q278 **Caroline Lucas:** I appreciate that we are at the early stages of research into this, but, from what you have said already, it sounds like it could be an extremely costly process to make sure that we are not—

Kate Hills: Potentially, yes.

Q279 **Caroline Lucas:** Does anyone else on the panel want to add anything on that?

Phil Brewin: If I may, I might just add that the low-lying areas that drainage boards operate in are characterised by a very dense network of watercourses. Water is moved through those systems and needs to be for the purpose of flood risk management, but also for providing water to environmentally protected areas, like SSSIs. We are encouraged to have that connectivity within the system for certain species like eels, which need to be able to bypass structures and access wetland areas.

It may not be that feasible to control invasive species at the point of transfer. It is much more practical to try to prevent them infesting the watercourse in the first place. While there are emerging technologies regarding fine mesh screens which can—as has just been mentioned—prevent the transfer of invasive species from one watercourse to another, or even from one catchment to another, those sorts of measures do need to be practical, effective and also affordable.

Q280 **Caroline Lucas:** Do you think enough is being done by the Government or indeed by the Environment Agency or anyone else on this? I must say I am slightly surprised that the research and the proposals for how we deal with this aren't further advanced, because we know that climate change is accelerating at an alarming rate and, therefore, the need for these water transfers is only going to get greater and faster.

The idea that we are somehow going to have sorted out all of these invasive species, so that the water that we are transferring is clean enough in the first place, seems to be a bit of an heroic assumption. It seems to me, at least, that it probably takes longer to get rid of those invasive species that are in our current supplies. We are not going to have time to do all of that before the very pressing need for making water transfers will be very real.

Kate Hills: I think awareness is increasing. I do not think funding is increasing enough to match that and deliver it.

Q281 **Caroline Lucas:** Just to be clear, will that be funding to the Environment Agency specifically or to the water companies, or both?

Kate Hills: All stakeholders and water users, yes. On the raw water transfer front, less water can be transferred if we use our water more wisely, so there is an onus on water companies to stop leakages, but also an onus back on the public to use their water carefully, reduce their consumption and be kind to their loos—put less down it, so we have less treatment of it.



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Q282 **Caroline Lucas:** Mr Atkinson, do you want to add anything on the subject?

Richard Atkinson: Obviously, canoeists want clean water and plenty of it. Obviously, with climate change and water transfers, we do need to make sure our rivers are able to be paddled in in the future and that the water quality is going to be okay as well.

Q283 **Chair:** Can I just come back to Mr Brewin? Obviously, you have over 400 SSSIs under your control. How many of them are in good condition?

Phil Brewin: In 2010 we were encouraged and funded to get them into recovering condition. We did very close to the 95% target, and I think we are still quite close to that. Favourable condition itself is a little bit more complicated than just the water. It also includes land management as well. I am not entirely sure, but currently we have not quite reached the 50% target that we were set for 2020. Largely, again, funding is the reason why more effort is not being put in to achieve that target.

Q284 **Chair:** You have a 50% target of “good” by 2020. What are you at now?

Phil Brewin: I am not entirely sure. It is somewhere around 40%, I believe.

Q285 **Chair:** Could you write to us with that number, please?

Phil Brewin: Yes, sure. I can give you the details.

Q286 **Chair:** When you say you need more funding, where do you think that funding should come from? You were funded by DEFRA in 2010, is that right?

Phil Brewin: Yes, for capital works.

Q287 **Chair:** How much did you get in 2010?

Phil Brewin: Within Somerset, the drainage board spent about £8 million on improving infrastructure and developing water level management plans, which certainly improved the conditions within the sites and brought many of them into recovering condition.

Q288 **Chair:** Was that all Government money?

Phil Brewin: Yes, largely, and also local money. If I may, there is the potential here to unlock the capacity of landowners themselves and farmers. We should really be looking at the new environmental land management scheme. There is an opportunity to fund farmers for tackling things like invasive species and helping us not only achieve favourable condition but sustain it in the long term in the face of pressures like climate change.

Q289 **Chair:** If indeed such a land management scheme ever happens.

Phil Brewin: Well, this is true, but there will be some sort of scheme, I am sure. We need to look at those opportunities.



Q290 **Chair:** We are all still waiting.

Ms Hills, we woke up this morning to the news that Southern Water has been fined £128 million for systematically and fraudulently misreporting what was going on in its sewage treatment works. This is the company, I believe, that miscalculated the levels of the Ardingly reservoir back in 2013. Do you not think there is a problem when water companies are putting people's bills up by RPI each year and this type of systematic problem is being uncovered by the regulator?

Kate Hills: Yes, it is a problem, and it comes from both sides. Water companies can do better and need to, and the increasing fines will be an incentive to do so, but the water users need to improve their approach to water and wise water use as well.

Q291 **Chair:** Do you feel disappointed that it is undermining all the good work that you are doing, to be let down by one bad egg of a water company?

Kate Hills: It is not good for the industry, but the industry as a whole is trying really hard, I think, particularly on the invasives front.

Q292 **Chair:** You didn't mention Southern Water when you were talking about the leading companies tackling this. You mentioned Yorkshire and some others in the east. What have Southern done?

Kate Hills: They are contributing to the secretariat coalition for check, clean, dry.

Q293 **Chair:** How much are they contributing?

Kate Hills: I do not know, as it is worked out on a scale according to size of company, but eight companies are putting in £150,000 each year for three years. I do not know what they are putting in, and I do not know what they are doing on the ground.

Chair: Okay. Great. Thank you very much indeed. That ends the first panel.

Examination of witnesses

Dr Kevin Austin, Dr Richard Shaw, Sara Redstone and Dr Anna Brown.

Q294 **Chair:** I would like to call our second panel to order and welcome our witnesses today. We would like to follow on from some of the very interesting conversations that we have just had. Can I ask the panel to introduce themselves, starting from my left with Dr Austin?

Dr Austin: I am Dr Kevin Austin, deputy director for agriculture, fisheries and natural environment at the Environment Agency.

Sara Redstone: I am Sara Redstone. I am the plant health and quarantine officer for the Royal Botanic Gardens, Kew.

Dr Shaw: I am Dr Dick Shaw. I work for CABI, an intergovernmental organisation working for 49 member countries. I am the director of the



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research centre in Egham, and I also look after CABI's invasive species activities in Europe and the Americas.

Dr Brown: I am Anna Brown. I am head of tree health and contingency. Can I just apologise for the glasses? I get light-induced migraines, so it is probably better for everybody if I wear them.

Q295 **Chair:** Fantastic. Thank you very much for coming. As a fellow migraine sufferer, you have my deepest sympathies.

If I can kick off, we have heard a lot about collaboration between governing bodies. I want to start with the Environment Agency because it seems like you have a key role to play here, and we have had lots of criticisms of your approach to non-native species. You heard the drainage board issue. We heard the issue around funding. Where do you sit in the middle of the invasive species web?

Dr Austin: We do not actually have specific duties in relation to invasive species, but what we do have are other duties where managing invasive species is a key part of our role—for example, protecting our flood assets, in particular, around the navigation, which we obviously—

Q296 **Chair:** Can you speak up a bit? It is quite hard to hear you.

Dr Austin: I apologise. We have duties particularly in relation to protecting our flood assets and ensuring open navigation and, of course, our wider duty to the water environment around framework directive obligations.

We spend in the region of £2 million a year on managing invasive species. We are also contributing to the DEFRA invasive species eradication programme. We have around four species, in particular, that we are targeting there at the moment. We have a key role particularly in terms of the aquatic invasive species. There has obviously been a lot of focus on that in today's session so far.

There is obviously a significant terrestrial environment where we do not particularly have a key role, but where we have, for example, riparian species like Japanese knotweed and Himalayan balsam, we are also responsible for managing disposal of material and ensuring that we do that following the law. We are also responsible for regulating the waste cycle and those who are abiding by the waste cycle, and water companies, of course.

Q297 **Chair:** We had evidence from the Upper Calder catchment area that some of the terrible flooding that they have suffered in successive years since 2010 has been made worse by the Himalayan balsam invasions. There was very strong criticism that those invasive species had not been removed by anybody. You are responsible for them, but it is the landowner's responsibility to get rid of them. Would it be useful to you if you were responsible for eradication? If you had responsibility and powers, what would change?



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Dr Austin: We need to recognise that when you are talking about established riparian species like Himalayan balsam and Japanese knotweed, the extent and coverage of those species, and probably the current ecological impossibility of eradication, would make that an exceptionally expensive piece of work. It is all very well having the powers and duties, Chair, but the funding that would be necessary to put that forward would be probably beyond the public good.

Q298 **Chair:** It is a cost-benefit analysis, isn't it, if you look at the insurance costs of flooding an entire village and the millions of pounds that go back into repairing people's homes?

Dr Austin: In terms of the specific example you talked about, I am not aware of the cause and effect in terms of the flooding in that particular area. We have recently had, obviously, quite significant rainfall in Wainfleet that led to dramatic flooding, but those kinds of exceptional events, which we are going to see more of with climate change, will lead inevitably to flooding in some areas. I do not know whether Himalayan balsam specifically was the cause in that area, and I would have to come back to you with an answer in relation to that.

Q299 **Chair:** In answer to my question, would it be useful? I cannot see who is responsible. Everyone is talking, but I cannot see who is responsible for enforcement action, and that is where we are grasping at the air. Would it be useful for you to be responsible for it, as you are for regulating lots of other areas of the environment?

Dr Austin: Responsibility is fine as long as it comes with funding. It is for Government to decide how to allocate the funding and how to allocate that responsibility. It is our responsibility, I suppose, to identify how we use the funding we do receive to deliver against the powers and responsibilities we have and ensure the best operational use of that funding.

Q300 **Chair:** We have had the British Ecological Society saying that all actions are hindered by lack of funding and clear lines of responsibility. Nobody is accountable. Therefore, nobody is answerable. Therefore, nothing happens. The IDB thought you were responsible for their own ditch.

Dr Austin: In relation to the IDB, as I said, we have responsibility and powers over the waste and water sector. Now, I would have to check, but I do not personally think we could force the IDB to do that work. What we do have are powers under a 2015 amendment to the Wildlife and Countryside Act to go in and put in place orders to eradicate species where we think there is a particular problem, but, of course, that does not give us the power to force the landowners to pay for it, so it would require additional funding to take action. There are some powers—

Q301 **Chair:** Could you sue them? Is there a civil action that you could take if the landowner did not clear out those—



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Dr Austin: You could exert powers on the landowners if you could prove that the landowners were responsible for the arrival of those species there. Now, that is obviously incredibly difficult.

Q302 **Chair:** Okay. That is interesting. I am just going to finish my line of questioning, if I may.

Can I move on to Ms Redstone from Kew? If Zac Goldsmith was here, he would say—I am going to ask his question for him—that you discovered the oak processionary moth way back when, several years ago, and went to Government and asked for a very small amount of money to eradicate it. That money was not forthcoming, and now the oak processionary moth is rampant throughout the whole of the south-east of England. Is that an accurate reflection?

Sara Redstone: I would say that we certainly made stakeholders and Government aware of the issue, but the person who discovered the outbreak initially was an environmental health officer from Richmond. He was the person who made us aware. He was the person who encouraged us to check our collections to see whether the pest had spread into the Gardens. It was at that point, in September or October 2006, when we decided that, as we had found three nests, we needed to take action and make sure that our neighbours were aware of the problem, and we developed a co-ordinated strategic approach to try to tackle it.

Q303 **Chair:** You tackled it on your site, but there was not a co-ordinated approach?

Sara Redstone: Part of the challenge at that point was that the oak processionary moth was not recognised as a statutory pest. It was not a notifiable organism, and therefore neither the Animal and Plant Health Agency nor the Forestry Commission could issue statutory notices to require landowners to take action.

Q304 **Chair:** Is it recognised now?

Sara Redstone: Yes.

Q305 **Chair:** There is a regulatory lag.

Sara Redstone: Yes, and I think that is one of the challenges not just for organisms that we know are likely to be an issue for the UK, but also for organisms that we do not yet know of. It is one of those challenges with a system that is very list-based. Our legislation is based on tackling organisms of which we are aware, where either through our own experiences or the experiences of other countries we know there is likely to be a significant economic or environmental impact.

Q306 **Chair:** It is the unknown unknowns that we need to be looking for?

Sara Redstone: Unfortunately, yes.

Q307 **Chair:** What about the fact that the fungi are not classed as non-native invasive species? Does that cause you a problem in the plant world?



Sara Redstone: I am not aware that that is necessarily the case. Certainly Kew, as you know, is a global resource, and one of our key areas of research is fungal taxonomy and biology. We hold scientific licences to enable us to import fungi from around the world, some of them pathogenic but some not. Many of the ones we are interested in are what we call mycorrhizal fungi—fungi that have an association with plants, and at the moment we are particularly interested in mycorrhizae associated with forest trees in different parts of the world.

I am not clear why people think that fungi are not controlled. Certainly, if you look at the importer's guide for plant health, you will see that fungi are listed as a plant. It is something that my students find very amusing. Fungi and algae are definitely included in the user's version of the legislation.

Q308 **Chair:** Our understanding of the Great Britain invasive non-native species strategy is that it does not cover ash dieback, sudden oak death or chytrid fungus in and of themselves. Dr Brown, can you enlighten us?

Dr Brown: There are two separate parts that you are looking at. If you are looking at the EU level, you have the invasive alien species legislation, and then you have the plant health legislation. They sit within different directorates within the EU, and as the legislation comes down into the UK, we end up with separate bits of legislation. There is legislation, obviously, for fungi and pathogens. I am a plant pathologist by training, and it is my background. They are covered; they are just covered under that legislation, as are the tree pests and the other plant pests that we get. By "pests" I mean insect pests. They are caught up under that legislation.

Q309 **Chair:** There are two separate laws, one governing plants and one governing animals?

Dr Brown: You have alien invasive species. That is one piece of legislation. Then you have plant health legislation. Then you have animal health legislation. Do not ask me about animal health legislation, though.

Q310 **Chair:** Is that a weakness?

Dr Brown: I do not think so, necessarily. At a UK level, because we have the 25-year environment plan, and we have that overarching umbrella under which the different strategies sit, it allows us in some ways a little bit of flexibility as well. If you look at the plant health world, that has a biosecurity strategy that we are looking at updating next year. We also have our tree health resilience strategy. It allows us, and my DEFRA colleagues as well, to target and shape our strategies for that industry and for that audience to make sure that we are getting the best out of it and getting into that detail. I can see where it looks a bit weird from the outside, but there are some advantages to that.

Q311 **Chair:** Mr Shaw, or Dr Shaw—sorry, we have all the doctors here today—what do you think about the different legislation? Is it adequate in terms



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of lines of responsibility?

Dr Shaw: I think that as long as they are captured by one, and it is not passing the hot potato between two different Departments, then it is okay. Many other countries have the same issues with the Ministry of Agriculture and the Ministry of Environment arguing about who is responsible for whichever new pest. Plant health regulations are very clear. The invasive species regulation in Europe is supposedly separate to plant health, but recently the EU has done a risk assessment on the box tree moth caterpillar, which is clearly a plant health issue. It is a very strange greying of the lines, in my opinion.

Q312 **Chair:** I have reported box tree moth into the Kew reporting portal. There are a lot of places around by me where I see it. I just wanted to get my volunteer badge. I would like my Blue Peter badge for that.

Sara Redstone: Thank you very much.

Q313 **Chair:** To come back to Dr Austin, is this not a problem? You are relying on the knowledge of volunteers to report in and do the right thing. It does not seem that we have the resources to create this mass eradication programme or this biosecurity programme when a new species or problem is identified.

Dr Austin: I absolutely would not want to understate the importance of surveillance by the general public—they could be canoeists, fishermen or just general walkers—but that is not the only surveillance that we do. We have our own staff out on the watercourses. If we know we have had a problem with an invasion of floating pennywort in the previous season, we will be out there doing ongoing surveillance to see if it is coming back.

We also do additional scientific research. We are currently working with the University of Brighton to see how we can use remote sensing to identify the reflectance of particular species, particularly with *Crassula helmsii*, the swamp stonecrop, to see if we can identify where these things are. There are other mechanisms. We are not just reliant on the general public from a surveillance perspective.

Environmental DNA is another thing that we have put quite a lot of work into, funding research, and that takes the opportunity to do short amounts of samples and identify what invasive species are in those water bodies too. There are quite a lot of other measures. It is not just the general public.

Q314 **Chair:** Your staff, we heard last year, were very busy with the heatwave and doing fish rescues, which is one of the reasons why they were not doing the spot checks on the waste exporters. You say you have staff doing it. How many dedicated staff are there in the Environment Agency for this?

Dr Austin: Most of our teams in fisheries and biodiversity are what are called multiskilled teams. A lot will depend upon the need within years. In



2017, when we had an explosion—partly to do with weather conditions—of floating pennywort, I think we spent £650,000 across the teams. Now, there would obviously have been quite a lot of staff working on that. We got that spread and infestation really scaled back for the following year, last year. The fact that we had put in a considerable effort—I think we had removed 1,000 tonnes of material—and the fact that we had a very cold spring, which for many of these species that are coming from warmer climates reduces their ability to spread in a particular year, meant that we did not have to put as much effort in.

It will vary from year to year. That is where the infrastructure and capacity that we have in the EA around incident response really comes to the fore, to be honest, because we can treat any incident, whether it is dry weather or invasive species, and then scale up as necessary.

Q315 James Gray: Just focusing on the EA, my experience is that you do a great job on the major waterways for which you have responsibility, but there is a huge network of waterways, some of them quite large, across England for which you have no responsibility. What happens if floating pennywort, for example, occurs in one of those streams that are tributaries to your rivers but for which you have no responsibility? Do you have any interest in that at all?

Dr Austin: Of course we have an interest if it is spreading and has an impact on our assets, but there are the limits of our duties and powers that we have referred to earlier, and I do not want to go over that conversation. I would say that we pay very close attention to new threats and emerging infestations even if they are on those bodies.

You had the conversation earlier about the clam. We are well aware of that case. My understanding is, for example, on that IDB site, that that clam's biology means that it is limited by the salinity of the water, and we do not currently believe that there is a risk of that spreading beyond that point. We are nevertheless still working with our technical advisers to identify an eradication plan where we can have a conversation with the IDBs about that. We definitely do not turn our back.

Q316 James Gray: In terms of the vast network of streams for which you have no responsibility or knowledge, many species—for example, the crayfish—may be 10, 20, 30 or 50 miles upstream from the river for which you have responsibility. Is there any mechanism by which the riparian owners who have responsibility up there would advise the EA or indeed others? Who has responsibility for eradicating crayfish in the Bybrook in my constituency, probably 20 miles away from the Avon for which you are responsible?

Dr Austin: I mentioned earlier the technical difficulty of eradicating some species that are in a significant catchment of water. As an ecologist myself, I have to say that, in terms of technical feasibility, currently, for a lot of those removals—whether it is killer shrimp in a massive reservoir or



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crayfish, in particular, which cause significant issues—total eradication is not a feasible option.

- Q317 **James Gray:** That was not my question at all. You have answered that. My question is that, for the majority of waterways in England, probably the vast majority, the EA have no responsibility, no knowledge and no involvement. You do not look after them. Who does have responsibility for invasive species that might be found in waterways for which the EA have no responsibility?

Dr Austin: That is where collaboration does come in. For example, between 2009 and 2015 we funded the local action groups to the tune of about £1.5 million to undertake work within wider catchments to help with that problem. There is definitely an issue about tackling some of these species at a wider catchment scale—

- Q318 **James Gray:** Sorry, I really want to boil down this one. Those things are great, but that is not the question. What I want to know is who is responsible. If there is an outbreak of floating pennywort, crayfish or anything else in waterways for which the EA have no responsibility, who does have responsibility for reporting those outbreaks? Who is responsible for the waterways for which you have no responsibility?

Dr Austin: We go back to the law and the issue of the responsibility of the landowner to prevent further spread of those species. Obviously that is the fallback scenario.

- Q319 **Chair:** It is the local council's if it is a stream in a park, it is the IDB's if it is their asset, it is the Canal & River Trust's—

Dr Austin: It does not necessarily give a duty to eradicate, but it does give a duty to prevent further spread.

Chair: We are not talking about eradication, but what we did hear from the scientists is cordon sanitaire to prevent spread.

- Q320 **John Mc Nally:** How do you co-ordinate your activities with those in Scotland, Wales, Northern Ireland and Ireland, given the practical differences between how the Governments work?

Dr Brown: The Forestry Commission is part of the UK plant health service, and that includes, obviously, DEFRA, the Forestry Commission, the devolved Administrations and also the Crown dependencies. We have a variety of groups within the UK plant health service. Today, two of those groups are meeting—two UK plant health coordination groups. I will be meeting some of my Scottish colleagues later on on the Isle of Man.

Also, we have just started up what used to be called the four admins group. It is more of a strategic group, and we are calling that the National Plant Protection Organisation, NPPO, for the UK. We have just started that up more recently, and that is taking a strategic look at issues and reflections on the plant pests that we need to manage, making sure that the proposals and policies are proportionate. As you know, plant



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health is devolved, as is forestry, but it is really important that we have that UK co-ordination, because pests and diseases will not respect those boundaries.

We work at that level, and then underneath that we have something called the UK plant health risk group, which has all the countries that sit on it. That looks at a whole range of pests. It is a bit like our known unknowns and—well, not the unknown unknowns, but all the other ones in between. They are assessed by the group and a variety of working groups underneath that on their economic, social and environmental impacts. That helps us work out how they should be managed should they occur.

We have that side, and then we have a variety of stakeholder groups for the wider industry. We have the UK plant health advisory forum and then in England we have our tree health policy group forum. Scotland has a Scottish tree health advisory group that I sit on as well, and Wales has something very similar. We just make sure that we co-ordinate our activities between ourselves.

Then, when it comes to an outbreak, we have our UK chief plant health officer, Nicola Spence, who looks at it on a UK perspective. Scotland obviously has Gerry Saddler as their chief plant health officer and head of SASA. It is making sure that if we have an outbreak that will affect more than one of the countries, or could potentially affect more than one of the countries, everybody is involved in that. We have something called lead Government Department meetings. Both England and the DAs will be fully aware of the different steps that are going to be done and what sort of surveillance they might need to do in Scotland, for instance, if we found a pest that might be of relevance to them. It is a very joined-up approach within the plant health service.

Q321 Dr Matthew Offord: Yesterday we had the second reading of the Kew Gardens Bill to allow greater financial abilities for Kew Gardens to operate. We want to make sure we are getting our value for money today.

Sara Redstone: I will do my best.

Q322 Dr Matthew Offord: I want to ask questions about the biosecurity of plant imports, particularly about issues surrounding the effectiveness of quarantine of plants. How can you ensure that that quarantine is successful?

Sara Redstone: At Kew we were fortunate enough to have been funded by DEFRA back in 2009-10 and to receive support for the development of a purpose-built plant quarantine facility. Our previous building was no longer fit for purpose, and our worldwide activities had been tailored to the facilities we had at the time. The total project cost of the new building was £3.6 million, and it was opened in summer 2011. It enables us to ensure that material coming into Kew, both to the seed bank at



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Wakehurst but also to the gardens at Kew, is inspected and, if necessary, treated or destroyed.

Where it is necessary, either legally or for biosecurity reasons, we can undertake a period of quarantine before material is released. The statutory quarantine period for plant material that is normally controlled is a full growing season, which we interpret as one full calendar year, but we know from our own experience that it is not uncommon for different types of plant material to require significantly longer because they can have latent infections or infestations that only become apparent after a longer period of time.

The facility is just one aspect of plant health and quarantine and our approach to biosecurity at Kew. Every single member of staff who joins the organisation, whether they are staff or student, comes through an induction period that includes a session with either a tour of the quarantine house or an explanation of why biosecurity is important, whether they work in the shop, whether they are a new member of the science directorate, or whether they are working in horticulture and elsewhere, so that everybody has an understanding of their roles and their responsibility and also, at a personal level, of how their choices in their day-to-day life could potentially impact UK biosecurity.

We also share what we know. I have personally learnt a great deal through the development of the new quarantine facility. I was the client for the build. I developed the user specifications with a team of colleagues. What has been particularly rewarding is that I have been able to share that with other organisations and institutions. Edinburgh at the moment is planning a new plant health suite that will include new quarantine facilities. I have also been approached by and spent a lot of time working with colleagues from Australia and New Zealand, because one of the key drivers for our facility was not just to make sure that we provide the highest level of containment but also to make sure that we could afford to operate it—that it is sustainable. That has been something that has not always been the case in every other facility the UK has developed. I do not know if I have answered your question.

Q323 Dr Matthew Offord: I think you have.

Sara Redstone: If you would like to come for a visit, you would be more than welcome. I can bore for England on the topic. I have brought some documents with me. We provide handouts. We invite members of staff and students to come along to tours so that they understand how the facility works and what their roles are. I have developed a module. I teach on the diploma. I also teach on our MSc in plant and fungal conservation. I have taught students on MSc courses from places like Exeter and others as well. What has been great is that I can use real-life examples. Quite often the names are changed, but I can provide a flavour so that things are not dry and dusty.

Q324 Dr Matthew Offord: I shall be voting for the Bill at Report stage and



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certainly at Third Reading, after hearing your reassurances.

Dr Shaw, I wanted to ask you about quarantine requirements for certain species that come from countries that pose a greater risk to biosecurity. Presumably we have a “one size fits all” approach in the United Kingdom. Is that really adequate for some countries that obviously would pose a risk to our ecosystem?

Dr Shaw: In terms of the quarantine requirements for imports of plants, for example, they have to come with a plant passport if they come from a region where there is a pest issue. We operate four quarantines around the world in CABI. We have just built one in Pakistan that is about protecting the environment from organisms that we are researching for potential control of invasive species. That is normally all regulated through the plant health Department, but sometimes the Ministry of Agriculture in some countries. It is fairly effective.

There is a slight discrepancy between plant health being extremely strict under the Wildlife and Countryside Act, where perhaps releases into the environment are very well dealt with, and the study of organisms that may be injurious to insects or other organisms in the field, that are less well-regulated in my opinion. We always deal with them in quarantine, but I am pretty sure other people deal with them in their university lab.

Q325 **Dr Matthew Offord:** Dr Brown, we spoke earlier about the oak processionary moth and about import restrictions. Are they tight enough now to prevent a further outbreak by another species? Clearly something did occur, in that that was allowed to enter this country. Dr Redstone has already said that this was identified by an environmental health officer in Richmond rather than through any of the procedures that we would have anticipated. I am sure that we do not expect environmental health officers in Richmond to be responsible for identification of any kind of invasive species coming into the country.

Dr Brown: That is true. To go back a little bit, before I go on to that—and this is a little bit from memory, so I am not 100% sure—I think the issue at the time was whether or not oak processionary moth was a plant health issue or a public health issue. I think it was between those two bodies.

Q326 **Dr Matthew Offord:** That is interesting in itself.

Dr Brown: I would have to check that, I am afraid, because that is just my memory from that time.

In terms of, “Are we doing enough?”, the question is not so much whether we are doing enough on oak processionary moth introductions, as whether we are doing enough on other potential pests and pathogens.

The way that it works is that there are two things that go on. At an EU level, different pests and pathogens are assessed, and measures are brought in by the EU that we would then put into our own domestic



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legislation. For instance, a recent one that we had quite a lot of influence over was bringing in high-risk hosts for *Xylella fastidiosa*, which is affecting olives in Italy and is quite a worry to the industry, as you have probably heard. The UK played quite a big part there, trying to influence the EU to make sure that we had this high-risk host list. That allows us to have a statutory notification scheme so that we know when they are coming into the country. Everything we do is on a risk-based approach. That is the best way to attack most things. That allows us to look at those things that are higher risk.

Another example is that we introduced a statutory notification scheme for firewood because we know firewood can be a problem, or could potentially be a problem, particularly from some areas. One of the things we are worried about is an ash beetle—emerald ash borer—which is currently in North America, but we also know that it is in Russia, and it is marching towards continental Europe—not marching but flying, presumably, towards continental Europe.

Dr Austin: Hitching a lift.

Dr Brown: Hitching a lift, flying, moving towards us. It is something that we obviously do not want. With the issues that we already have with ash dieback, it would be an extra thing to deal with. That approach allows us to target a very likely pathway for that, which is firewood. Firewood that is coming from that area, we can now target much more strongly. It is really having that risk-based approach.

In terms of oak processionary moth, last year we also strengthened the measures for that. The way that we manage oak processionary moth within the UK is that we have what we call our core zone, which unfortunately Kew is within, which is an area in which we accept that we are not going to eradicate the pest—it is beyond eradication. That is in London and the surrounding area. The way that we deal with that is to have a control zone around that. We target that control zone, a bit like your cordon sanitaire. We make sure that we do a lot of operations within that.

Beyond that boundary we have something called a protected zone. We have more protected zones than any other EU member state. A protected zone means that the pest of interest is not known to be present within that area, and therefore we can put controls in in terms of our imports and what is coming in. Recently we put some restrictions on larger oak trees coming in, unless they had been produced in areas where the pest is not known to be present. They are the most likely pathways. Again, it is that risk-based approach.

“Are we doing enough?” That was your question, wasn’t it? In terms of other things we are doing, we have increased our inspectors. At APHA, the Animal and Plant Health Agency, colleagues have increased their inspectors by about 240 now. We work slightly differently within the Forestry Commission. We work with contractors. It gives us more



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flexibility. The Animal and Plant Health Agency tends to be based at Heathrow full-time, or at Gatwick, because they have things coming in all the time. We are dealing with a very different commodity; we are dealing with logs and timber and things like that, so we tend to have less frequent inspections. For us, one of the high-risk things is conifer with bark on it. We do 100% inspections of that at our ports, but we use trained contractors to manage that.

It is quite remarkable that the EU member states really look at the UK as a leader in terms of our plant health regime. We are very highly regarded. We make more interceptions than any other EU member state. In fact we made 40% of all the interceptions in Europe, and that is not because we are getting a huge amount of things coming in; it is just because we have very good controls at the border. Yes, we can do more—there are always additional things you can do—but I think we are much further ahead than a lot of other places.

Q327 Dr Matthew Offord: My final question is surrounding e-commerce, which is another pathway, I believe. In their evidence, the Ornamental Aquatic Trade Association said there needed to be a better way of controlling e-commerce. They highlighted Amazon, Gumtree and eBay, where people were buying products online that were effectively not allowed within this country through the Animal and Plant Health Agency. As such, they found it very difficult to stop that.

They also said that some of the people who were selling these products were not aware that it was illegal and that there is no way of prosecuting them. They are advised that the law does not allow the importation of these products. This question is particularly to the Environment Agency, Dr Austin: what more would you like to see change to address that particular problem of e-commerce?

Dr Austin: That continues to be a significant problem. I can remember, going back 10 or 15 years, when you could still find—in those days, in manual shops—Himalayan balsam being sold, almost targeted at children, as “stinky pop” because of the way it explodes and has this stinky smell. The issue of trade is significant, and obviously online trade is the new issue.

Now, we would like to see rigorous control of that. That is a Government issue. It is obviously not for us operationally, but I think we do have a role in terms of advising on the kinds of species that we would need to have control over. It is probably the role for us as an organisation to do that. Yes, there is definitely a need for continued legislation in that area. We have toughened up in the last few years in terms of what—

Q328 Dr Matthew Offord: How have we toughened up though?

Dr Austin: I must admit I am not an expert on that legislation. As I say, it does sit very much in the central Government sphere. Maybe some of my colleagues on the panel could say more. I would say that we need to



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continue to keep the potential threats and the horizon-scanning of future threats on the radar and be informing Government of those.

Q329 Dr Matthew Offord: There is a problem with legislation around dangerous dogs, for example, and indeed in the sale of wood supplies. Sometimes suppliers will claim it is a certain variety of wood, and the reality is that it was a different kind completely. I find it difficult to explain the difference between iroko and oak, for example. I am sure you don't.

There is always the problem of who is going to enforce that. We mentioned earlier that trading standards do not have the resources. They also do not have the political will to undertake some of this work. I am not sure how your four respective organisations will be able to address this problem.

Sara Redstone: Could I just add to that?

Dr Matthew Offord: Please.

Sara Redstone: Although the primary purpose of the quarantine house is to serve Kew's needs and work with our science and horticultural staff who are importing live plants and fungi for research use, one of the other roles of the quarantine facility is to provide services to UK Border Force, the Animal and Plant Health Agency, the Met Police and others. Part of this role includes identification of plant and fungal material, providing advice on whether it has been wild-collected or cultivated, and maintaining it in a good condition while the importer has a right to appeal.

I think e-commerce is a huge risk to the UK, not just in terms of the introduction of invasive species that we know are an issue and that we have legislation to try to prevent the ingress of, but also in terms of a wide range of other organisms too.

The reason I say this is because I started this role in 2006, and at that time the average number of confiscations we would manage in a year was, generally speaking, somewhere between five and 10. It might be a few thousand plants or it might just be one or two for each confiscation. Since the new facility has been built, and completely against any of our forecasts, we have seen more than a tenfold increase in the number of confiscations we manage. In fact, in the last month, we have had something like 35.

This is a real sea change, and it shows a couple of things. One is that the team-building between the Animal and Plant Health Agency and the UK Border Force is proving very successful. Kew is spending a lot of time and effort providing training for those agencies to make sure that they recognise, for example, plants that are controlled under the CITES convention. We have expertise provided to identify things like timber that is being smuggled into the UK.



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This is an area where we really do need to think about how we are going to control the purchases people make online. I think they see it as a faceless activity where they have no responsibility, and one of the things we need to do is educate the general public about what impact their choices might make. I know that my colleague Mariella Marzano has done some interesting work and is in the process of publishing a paper on the choices that people make and how they choose the plants they buy, and apparently biosecurity does not feature in that unless you are looking at very expensive plant material and people who spend substantial amounts of money.

Q330 Chair: Could you tell us about the smuggled timber? Where is that smuggled timber going?

Sara Redstone: It is coming into the UK, into UK markets. It is being misrepresented. Kew is really about partnership, and one of the ground-breaking pieces of work we are doing at the moment is bringing in specimens from around the world, from known locations. We are working with bodies like the FSC, the US Forestry Service and others, and we are developing our xylarium. Just in the same way that a herbarium is a collection of dried plant specimens, a xylarium is basically timber specimens and other related items. Through the work of our wood anatomist Dr Pete Gasson, we are able to verify whether timber that is being imported to the UK is what it says it is. That is not just for the whole timber but also for composite. The other aspect of the work we are doing is working with industry partners and looking at isotope analysis so that we can pinpoint where timber comes from.

Q331 Chair: Is that timber that is coming in for decking, sheds, firewood? Where is the end market? It could be anything?

Sara Redstone: It could be a piece of furniture. It could be all sorts of things.

Q332 Ruth Jones: We have heard very clearly through this inquiry about the importance of early detection, rapid response and better success rates at less cost, so my first question is to Dr Austin and Dr Brown. How long does it take to respond to a threat once it has been raised?

Dr Austin: As I mentioned earlier, if we get a significant new threat, then we would treat it as an incident and go out accordingly. We would aim to visit as soon as possible, really. That could be days, or weeks, but it would be relatively quickly. It may be dependent on the nature of potential spread. If it is in an isolated site—a small pond or something like that—then, obviously, the urgency to get out there and address it is not so great as if it is in a ditch that could be attached to a main water body.

I suppose we have about four different types of early-response situation. If we think about something like the killer shrimp that I believe was identified first at Grafham Water, we got out to that relatively quickly. Although it is obviously in a huge body of water there, and actual



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eradication was not possible, what we could do very quickly was act and put in place biosecurity arrangements with the water body owner. Since then I think that has only been found in one further water body in England, although there are a couple of sites in Wales.

We then have the species where we have taken on the responsibility to eradicate. Coming back to your question earlier, James, around where we take on responsibility outside of the main water bodies, if you are looking at things like water primrose, topmouth gudgeon and other species, we have taken on responsibility there to go out and eradicate. We will act beyond our normal water body responsibility and get in there and eradicate. Again, we would aim to do that quickly. Sometimes that might require repeat year efforts. Something like water primrose has a complex rhizome system. It will look like it has gone after we have finished our work, it really will, but you will come back next year and there will be a few more fragments. We have to keep working on it. It is a year in, year out thing.

Similarly, if we had a new reported aquatic species as a threat, then we would get out to that as quickly as possible. We had a report of a new threat only this year—a new species called mermaid weed. As it happened, it turned out to be a misidentification, but, again, we got out to that quickly and liaised with the local recorders, confirmed that it was not a threat and were able to stand down. We are in a position with our instant capacity and response to step up and get out there quickly when that is the right way to act.

Q333 Ruth Jones: Thank you. Dr Brown?

Dr Brown: In terms of our response, it is very much managed through our chief plant health officer. One of the good things—if I can say that; it sounds a bit contradictory—that came out of the ash dieback was that a tree health and biosecurity taskforce was set up. That had various recommendations, and within that was the chief plant health officer, improving contingency planning, improving the response and upskilling people in plant health. What that has given us is a really good procedure to follow when we have a new report or a new response.

If it is a known unknown, something we do not have yet, the chief plant health officer would designate a competent authority—that might be the Forestry Commission or the Animal and Plant Health Agency—to set up what we could call an incident management team. This all happens instantly. Within an hour or so of the finding, we would be doing that. The chief plant health officer is also responsible then for working with the DAs and making sure we have those groups set up as well.

We have a generic contingency plan that changes depending on what the pest is; what the risk is; what the host is at risk of; what the environmental, social and economic impacts would be; where the pest is; whether it is something that we already have; whether it is widespread; whether it is our first finding, an interception or an eradication; and



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whether it is a breeding population, and so on. All these things feed into the decision response in terms of how we will deal with it.

For instance, OPM is quite a nice one because we basically have three stages. We have eradication. We have containment—that is, you want to keep a pest within a certain area and slow its spread or not allow it to get out. We accept that, in certain areas, you cannot eradicate it, but you want to contain it within that area. The third one that we get to as well is learning to live with it. We have reached the point with ash dieback, for instance, where we have to learn to live with it. We know that we cannot eradicate it—it is right across the UK.

OPM is an interesting one because we are doing all three depending on where you are. Within that core zone, where we are in that “learning to live with it” stage, we provide advice. If somebody in the core zone in central London phones us up or goes through TreeAlert, our reporting tool, and tells us they have OPM, we will respond within 48 hours to advise them on what they can do and what measures they can take as landowners themselves, but we will not enforce any measures within that.

Once you are in that control zone, if it is during the caterpillar season, which is when most people spot it, when the caterpillars are out and moving and we can do actions, within five days of receiving that report we will have gone out, assessed and served a statutory plant health notice that enforces work that is going to be done. We, Government, will have sprayed those trees within it and then the statutory plant health notice puts the onus on the landowner to make sure that they monitor the nests. The spraying should work, and you should not get any more caterpillars, but occasionally you will get caterpillars. The landowner would then, under those circumstances, be responsible for land ownership. It is a kind of shared ownership within it.

Then, if you move to the PZ—sorry, the protected zone that we have, which is the eradication area, if you like—we have an immediate response to that. We had a recent finding in Hampshire that I think was reported in the press last weekend or two weekends ago, and within a week we had the report and we sprayed the trees. This is something we would call an interception. They were recently planted trees that had come in. We sprayed the trees and then we destroyed the trees, and that was all done within a week. That site is cleared. We will go back every two weeks after that and keep monitoring to make sure there are no further outbreaks. We have three different phases with one pest.

Q334 Ruth Jones: In terms of rapid response, my background is health, and when you say “rapid response”, we talk about minutes, but I guess we are not talking about minutes here. Ms Redstone and Dr Shaw, when an invasive species of concern has been found in your area, how rapid have you found the Government response to be?



Dr Shaw: I think the early detection rapid response performance for Asian hornet is an exemplar of amazing performance from Government. There was a detection team ready to go the moment it came in; they knew it was coming, and they have gone in and nailed it every time it has arrived. They are holding back the tide—it is going to keep coming, but we are prepared and very well prepared.

Probably the best piece of rapid eradication I know of is from Kevin's colleague behind me, Trevor Reynolds, who found floating pennywort in Cornwall, pulled it out, threw it away and eradicated pennywort from Cornwall. The difference is knowledgeable people on the ground doing stuff and being empowered to do so.

We talked about whether we are doing enough. New Zealand has a Biosecurity 2025 plan where they are training 150,000 people to do just that—to be trained to operate in the field and implement biosecurity. That equates, if you multiply the population, to 2 million people in Britain, and the budget they have put in is equivalent to £83 million a year if you take the number of people as a ratio. That is how you do it. You really do it with the kitchen sink. Unfortunately we are not quite in that position. That is the best in the world. We are not the worst in the world, but we have a long way to go to get to that level.

Q335 **Ruth Jones:** If that is the gold standard, where are we in the pecking order? Is it bronze, silver, gold?

Dr Shaw: Doing better than the rest of Europe.

Sara Redstone: We are moving upwards. Things have certainly improved since oak processionary moth came on the scene in west London. Co-ordination and co-operation has definitely evolved and improved. I have to say I think the non-native species secretariat is a fantastic resource for the whole of the UK.

One issue I would like to mention is the question of areas for which local authorities are responsible. Certainly when oak processionary moth first arrived in the Kew area, one of the most significant time lags was areas that the local authority were responsible for, because you had to identify the pest, then present a plan of action to the environment committee, and once the environment committee recommended a course of action, it needed to go to the finance committee. There is possibly a role for central Government or maybe an agency to have funding available so that a rapid reaction is definitely possible wherever the pest or invasive species occurs.

Dr Brown: Could I possibly come in on that? I am sorry, I do not know quite as much about those early days of oak processionary moth. I was not involved in that. One thing I would say is that we do have powers under the plant health legislation and plant health forestry legislation to order statutory plant health notices, whether that be on an individual or a local authority. We do so relatively regularly.



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Q336 **Chair:** We were not aware whether it was a plant or a human health problem. Because it was not on your list, there was a lag.

Dr Brown: I think that was more of the issue. There are other examples where we have—

Q337 **Chair:** Should we not, in a precautionary principle way, just assume that if it has come in and it has an issue, it is bad and you should whack it?

Dr Brown: You have to consider, if you whack it or eradicate it, whether those eradication measures may be more damaging than the pest is itself. You do need to have—

Q338 **Chair:** This is something that causes breathing problems in humans, so, from day one, that is it—it should not be in the trees.

Dr Brown: You are talking about oak processionary moth specifically?

Q339 **Chair:** Yes.

Dr Brown: Sorry. Yes, I agree, and that is exactly what we do in the protected zone. In the protected zone, that is exactly our procedure.

Q340 **Chair:** My point is that it has taken 12 years for you to restrict imports on something that was discovered in 2006. In 2018, we had imports restricted on OPM.

Dr Brown: We already had a statutory notification scheme for oak prior to that. You need to build the intelligence to work out where things are coming from. You cannot restrict stuff unless you know where that risk is and whether those imports are coming in.

Q341 **Chair:** The Netherlands is the risk.

Dr Brown: They are one of the risks. We have had imports from the Netherlands, yes.

Q342 **Chair:** Any other countries?

Dr Brown: I would have to check with my—

Q343 **Chair:** It would be useful to know, but my point is that we have a duty under EU law to have a precautionary principle. Something like this, which was in three trees to begin with 12 years ago and is now right the way across a megacity of 10 million people, with big public health issues and big expenditure issues attached to it, is a tragic story.

Sara Redstone: One of the useful things to come out of the whole situation is that OPM and then ash dieback has led to the creation of the chief plant health officer's post and the equivalent for Scotland. That is really beneficial. Having a lead person responsible is definitely a positive change. As I say, I am just concerned that there may be issues for local authorities, whether you serve a statutory notice or not, in making sure that that funding is available.



Dr Shaw: Of course there are natural enemies that are not found in the UK that could be considered for biocontrol for OPM.

Dr Brown: And are being considered.

Sara Redstone: One of the challenges is always making sure—I am surrounded by ecologists, which is fantastic—that the cure is not worse than the disease. The challenge with oak is that it is such an important species for the things that live on and in it. Something like 750 different species are dependent on oak. The challenge is to ensure that what we do does not put all of that other biodiversity at risk. It is making sure that our response is proportionate and appropriate.

Q344 **Ruth Jones:** My final question is to Dr Austin and Dr Brown. How much do your departments spend on rapid response to evasive species each year? Are you happy with your individual pots, or would you prefer to pool it centrally?

Dr Austin: It is quite difficult to separate out what we would call rapid response. I explained how we would view that. I said we spend about £2 million directly on invasive species control in a year. I could not give you an exact breakdown on rapid response. It also depends how you define it. I am more than happy to try to submit something that gives you a little bit of a flavour of that anyway.

Would we be happy to pool it? I can see pros and cons, to be honest. From the strategic perspective of what we are going to prioritise, where we are going to spend it and where we are going to direct it nationally, a consolidated pot could be a better way forward.

If I am then considering staff behaviours operationally, there is something from the perspective of looking at what happens in EA areas. If we look at the floating pennywort outbreak we had in 2017, that was quite a significant cost of £650,000. Inevitably, in terms of operational budgets, that meant other things could not be done.

If you want to encourage a change in behaviour in terms of upping biosecurity performance and upping the extent to which you are proactive, then there is a degree of having that cost accountability for the budget within our own operations that might drive that behaviour change. There are pros and cons.

Dr Brown: We had an enhanced budget within tree health operations, as I would call it, which was about £2.9 million or in that region. About £1.25 million is spent on rapid response for oak processionary moth, if that gives you an indication. I can give you a fuller breakdown, if you want, for other things as well. Just let me know.

There would be merits in having a contingency fund for outbreaks. As I understand it—and this is not my area of expertise at all—there are budgetary constraints that make that quite tricky to do in terms of the Government and the way contingency can sit within the Government.



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DEFRA is very good at managing a range of different issues, whether that be flooding, pests and diseases, or animal health, and there is a process within DEFRA when you have an outbreak or an issue going through its committee to request additional funding. This is what we did in response to ash dieback. That provides additional funding in response to that, to the Forestry Commission, to DEFRA policy and also to the Animal and Plant Health Agency. There is already a process there within the Department. So I am not entirely sure it is necessary.

Q345 Chair: Can I go back to the local action groups? Dr Austin, you mentioned the funding they had of £1.5 million between 2009 and 2015. How much funding have they had since 2015?

Dr Austin: Since 2015, they have had dedicated funding in terms of grant in aid from the Government under the water framework directive budgets until then. Subsequently, we have run a water environment improvement fund grant, which is open to wider partnerships and volunteers in the water environment at a catchment scale. LAGs have been encouraged to bid into that. I could not tell you at this juncture what the specific breakdown of that budget is that they have been successful at achieving, so we will give you—

Q346 Chair: What is it called?

Dr Austin: The water environment improvement fund, which has subsequently been moved in terms of funding into rural development plan funding and is now called the water environment grant.

Q347 Chair: It is funded by common agriculture policy funding now?

Dr Austin: Most recently, at least part of that funding has been supplemented by rural development plan funding. There is probably a degree of co-financing by the Government as well.

Q348 Chair: If you could let us know how much has been spent on that, it would be very helpful. Thank you.

One of your big successes has been the topmouth gudgeon eradication programme. It is a big name for a very little fish. We have photos in our brief. We have been told that it has gone down from 34 sites to just three known populations. Is that still the case?

Dr Austin: I am told that one of the issues with a lot of the species we need to eradicate is that we discover new sites every year. They are not new sites because they have spread to those new sites; it is just we do not have the intelligence that these sites exist. I have been told—literally breaking news as I walked in here—that, unfortunately, one additional site has been found for topmouth gudgeon.

Q349 Chair: Where is that?

Dr Austin: I do not have the geography of that at the moment. I was just told that we found one more site. We are still aiming and expecting to have eradicated topmouth gudgeon altogether by 2021.



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Q350 **Chair:** It would be helpful if you could give us the sites and then, in our final report, we can publish where the sites are and people can be educated.

Dr Austin: Twenty-six sites have been successfully eradicated.

Q351 **Chair:** How did you do it?

Dr Austin: I am not technical enough to know, but it is nasty chemicals, I think.

Q352 **Chair:** It is probably nasty chemicals. Thank you. Dr Shaw, you mentioned New Zealand. What other gold standards could we learn from?

Dr Shaw: I am biased in that I work in biological control, which is a longer term strategy. Rather than sitting and watching things spread or giving up, it is about trying to use natural enemies to control them. New Zealand is a world leader in that, along with Australia, because they have a lot to lose as large islands with high biodiversity—much the same as us. DEFRA has been supporting that work since 2010, using water framework directive money, and we are working on biological control of Japanese knotweed, Himalayan balsam, *Crassula helmsii* and floating pennywort.

Floating pennywort is very topical with this panel. We have a weevil from Argentina sitting in our quarantine facility at the moment, which is a voracious feeder of floating pennywort. We are going through the review process now to see whether it is safe enough to release. There is some artefact feeding in the lab that also happens on Argentine species in the lab that never get attacked in the field, so we are pretty sure it is just an artefact from the lab, but they are important species, so we need to be super-careful.

The knotweed psyllid is not working yet, but literally this time last week I was on a plane carrying back some new psyllids from further north in Japan, better climatically matched bugs—through the red channel in Heathrow, I am pleased to say.

Sara Redstone: They passed their health checks?

Dr Shaw: Yes, they are very clean. For *Crassula helmsii*, the Australian swamp stonecrop weed, we have a mite from Australia that has been released into the field, and which has successfully over-wintered at one site, which is the first hurdle to clear.

Finally, for Himalayan balsam, we have a rust from Pakistan and India that has been released. It turned out to be a better taxonomist than the taxonomists and detected varieties in the population of Himalayan balsam that we did not know were there. We need another strain from Kashmir to finish that job off.

Yes, it is a bit challenging. It is early days. We are ahead. We are doing more biocontrol than the whole of Europe put together. It is something that New Zealand and Australia start the moment they have a serious



invader that is out of control; they start a biocontrol programme, knowing that, in five to 10 years, they may have a potential solution. But it is not a guaranteed success. That is the problem, annoyingly.

Q353 **Chair:** It carries its own risks and issues as well.

Dr Shaw: The risks are incredibly small. For weed biocontrol, something like eight out of 1,500 releases have ever fed on anything not expected.

Q354 **Chair:** What are the arguments against it, if the risks are incredibly small?

Dr Shaw: Everyone knows about the cane toad. You cannot get past the cane toad story, which was an act of madness with a vertebrate predator that will eat anything it can fit in its mouth. These are specialist natural enemies. You have talked about oak. There are plenty of species that feed only on oak and will never feed on anything else. That is what we seek in biocontrol. Japanese knotweed has 186 insects feeding on it. We found only one that was specific enough to be considered for release. It is an incredibly thorough host-range testing process and safety testing. Our careers are on the line, as much as the UK environment.

Chair: Great. If you have anything for my plum-boring caterpillars, I would be grateful. The ladybirds are doing a good job, but it is not enough. If you have anything in your matchbox that you can let me take home, that would be very helpful. A final question from Alex.

Q355 **Alex Sobel:** Thank you very much. We have heard a lot in this inquiry about the most persistent, hard-to-control invasive species. I will be honest, I was not aware of Australian swamp stonecrop or floating pennywort, although I did know about Himalayan balsam and Japanese knotweed before. These are some of the most persistent, hard-to-control invasive species. Why is their management so challenging? What are the most sustainable long-term approaches for these and the other forms of aquatic and riparian weeds we are coming across?

Dr Shaw: I am always going to say biocontrol. That is why DEFRA and colleagues have funded this work. When you are on a catchment scale with hundreds of landowners, even with the right to access and control, it is very hard to get them all to work together. It takes just one plant at the top of the river chucking out seed and it reinvades, so you cannot really operate at that catchment scale. But the fungus does not know any boundaries. It will spread wherever it can.

The same goes for *Crassula* where we have very sensitive sites. It seems to know the scientific quality status of a site before it invades it. It seems to know where to be in Ramsar sites and SSSIs. It is almost impossible to control. We have spent a lot of money trying things like hot foam and liquid nitrogen in desperation. Hopefully, this mite can deal with at least the emergent stuff. It cannot hold its breath long enough to deal with the submerged, unfortunately.



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With floating pennywort, the tiniest fragment is a disaster. Just to put it in context, water hyacinth is a famous plant on the list that is never likely to establish in the current climate conditions in Britain, but it is a massive invader in Spain and Portugal. The Spanish have spent €28 million pulling it out of one river, and it is back. It is not going to work. It will never work. But they just keep pulling it out and burning euros on the bank. There is a biocontrol agent available called *Neochetina eichhorniae* that works all over the world, but they are too blinkered—that is very rude; they are not aware of the potential perhaps, or they are inherently against the idea of bringing in another “there was an old lady who swallowed a fly” approach. There is a lot of education required, which is our responsibility.

Q356 Alex Sobel: The convention on biological diversity talks about a hierarchy, with prevention coming first in that hierarchy, but the evidence we have gathered shows that there is very little funding for prevention. Most of it, as your example of Spain and Portugal showed, but also here, is for either biological treatment, chemical treatment or, in some cases, mechanical treatment. That was the example you gave.

What do you feel would be effective ways of preventing these things? Would habitat restoration be the best way to do this? What do you think the best way is to prevent us having these invasive species, rather than having to control them down the line?

Dr Shaw: CABI sits on the interagency liaison committee on invasive species under the CBD, and we work on collaborations about how to prevent things arriving, as it is always the best bang for your buck. That sort of investment pays off very highly.

Some countries operate a white list, and they have species you are allowed to import. Other countries, like us, operate a black list, which. There are 2,000 species plus a few hundred on the black list, and those are the ones you perhaps need to prevent. It is a big step to change to a white list system from a black list system. New Zealand is much more efficient because literally everything is banned unless it is on the list to come in. That is how you would really prevent it, but that is probably a step way too far as far as imports and trade are concerned in this region.

Q357 Alex Sobel: Why?

Dr Shaw: If there is the political will, I would back it, but I suspect there is not.

Q358 Alex Sobel: That is what we are here for. You need to tell us that. We are here to change the political will. That is part of our role.

Dr Shaw: I am imagining the WTO arrangements and European arrangements.



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Sara Redstone: There are something like 75,000 different plant taxa in British gardens alone. Like Dick, I very much support the precautionary principle, but it would require a real change in mindset.

Q359 **Alex Sobel:** You are saying that it would be public will rather than political will? It is the public?

Sara Redstone: If the public will was there, the political will might follow.

Q360 **Alex Sobel:** That is what I mean, yes. We do not have the public will and so we need a public education campaign?

Sara Redstone: Yes.

Q361 **Chair:** Can I seek clarification on the rapid response working group? This was set up back in 2008. The 2015 strategy on non-native species said that the rapid response working group would be reconvened to help review past and current responses and develop greater capacity. Has that happened with the Forestry Commission and the Environment Agency?

Dr Brown: From my perspective, I work on plant health, so I do not really work under the IAS regulations and strategies. I tend to work to the plant health strategies, so I would not be on it anyway.

Q362 **Chair:** You would not be on it anyway, but we have been told that you are members of the rapid response working group within the GB Non-Native Species Secretariat.

Dr Brown: I am not personally, but I can check to see if someone is.

Q363 **Chair:** Does that ring any bells, Dr Austin?

Dr Austin: Not through the rapid response working group, but I am sure we could get you an answer on that.

Chair: It is one of the things that came out of the 2015 strategy. Four years on, we are trying to work out if the strategy has gathered dust on a shelf or has been implemented. The fact that we are drawing blanks from both of you may be interesting. If you could both go back to your organisations and write to us on that, it would be very helpful.

Thank you very much indeed. This has been a very fascinating session.