



Environmental Audit Committee

Oral evidence: [Invasive species](#), HC 913

Wednesday 26 February 2014

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Written evidence from witnesses:

- [Defra](#)
- [Professor Chris Thomas](#)

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Members present: Joan Walley (Chair), Peter Aldous, Martin Caton, Zac Goldsmith, Mark Lazarowicz, Dr Matthew Offord, Mrs Caroline Spelman, Dr Alan Whitehead, Simon Wright.

Questions 167–234

Witness: **Professor Chris Thomas FRS**, University of York gave evidence.

Q167 Chair: I would like to give you a warm welcome to our session this afternoon. It might be helpful for you to know that we have two sessions, and because of the votes in the Commons, it is likely that the first one with you will end at about 3.5 pm, so we have about four or five questions. We may complete that before 3.5 pm, but that just gives you an indication of the time that we have available. Thank you for coming along.

I wanted to start off by asking you this: the evidence that we have had from other people giving evidence to the inquiry has suggested certain things, but you suggest in your evidence that the impacts of non-native species for Britain have been economically and environmentally modest. It does seem to us that some of that does not quite accord with some of the other evidence that we have received. What we are trying to understand is whether or not there is a substantive difference, or whether or not your views are at variance with views of other commentators and academics. Could you perhaps set out for us where your agreement is or where your disagreement is, and whether or not there is some kind of a divide in the evidence that we are receiving?

Professor Thomas: I don't think that there is any serious disagreement about the evidence. There might be some disagreement on how we would then interpret that evidence as the need, or otherwise, to take particular actions.

The impact of non-native species is clearly extremely variable. It can cause widespread change to a given species; an example is the grey squirrel replacing the red squirrel over most of Britain, mediated by a shared disease that the grey squirrel is more resistant to. But on the face of it, according to the Helen Roy et al. report from the NERC Centre for Ecology and Hydrology, about 1,875 non-native species have established in Britain and no native species have become extinct from the entirety of the British Isles as a result of the arrival of those non-native species, the possible exception being the large blue butterfly that died out when myxomatosis arrived in Britain, but the butterfly survived for longer than it would have done otherwise because rabbits were here, which is another non-native species.

Non-native species have very substantially increased the number of species in Britain, but if we take just the plants that people are very concerned about, the terrestrial plants—and others will speak to aquatic systems and know much more about them—about half as many again non-native species have arrived and established in Britain, but they only cover, from the CEH data, just under 2% of the land surface, so per non-native species, the cover is much lower than on average per native species. Therefore, I would argue that changes, climate, nitrogen deposition, habitat management and so on have changed the relative abundances of native species far more than these other processes, and are much bigger agents for change than the non-native species are themselves.

Q168 Peter Aldous: Can I just pick up one specific point you made about the grey versus the red squirrel? If the grey squirrel had not been introduced, what would the population of red squirrels be like now?

Professor Thomas: It would still be down here, it would be across Britain. We also have the North American crayfish, which is more resistant to a disease than the native crayfish. Some of these examples, where the invader is more resistant to a disease than the corresponding native species, enable this sort of replacement.

I should point out that in nearly all of the cases where there is a serious impact on a native species, the origin of the invader is somewhere like North America or Eastern Asia or, for some of the aquatic systems, the Black Sea/Caspian areas, which are quite distinct, and without very long distance transport, it would have been very difficult for these species to get here, whereas for virtually all European origin species, or nearer European origin species, the impact seems to be much more modest, usually.

Q169 Chair: Is the issue one of definition? Is it somehow or other that the definition and the language has not kept pace with changes, whether in climate or other changes? How would you define non-native and how would you define invasive? Is there some kind of a continuum where there needs to be a corresponding change of definition, somehow, in terms of where the focus of policy should be via diversity?

Professor Thomas: You are absolutely right that there is a continuum, and this of course then makes things inconvenient, because where along this line of continuum would you draw a line? Many invasive species biologists—and there is literature—define an invasive species as one that causes harm or major change. The difficulty then is how you define harm. Often harm is defined as a given baseline of what you expect the environment to be without that given species or set of non-native species. I find—in the context of climate change, nitrogen deposition, and so on—the idea of a static baseline is not a feasible one anyway.

Q170 Chair: In your eyes, would you have an invasive species that did not cause harm?

Professor Thomas: We can have a species that was previously non-native that becomes widespread but does not threaten the other species with extinction. That is quite normal. Essentially, all the animals and plants you see in Britain now were not here 11,000 years ago, towards the end of the last ice age. We have a set of species here that over the development of species and ecosystems have flowed back and forth across Europe. To think there is something special about the species we have here is not realistic, particularly in the context of ongoing and continuing climate change.

Q171 Chair: Finally from me, going back to what you were saying about invasive species causing harm, in terms of the costs, for example, CABI have suggested that there is something like £1.7 billion needed to manage the harm that invasive species are causing. Would you say that that was necessary expenditure or unnecessary expenditure?

Professor Thomas: What I would do is invite you to ask the question as to how much. I am not an expert on the economics of invasive species, but some of those control costs—for example, water weeds in waterways we wish to keep open for boat traffic—we might consider essential. There may be other controls that we are doing because we are exhibiting a preference for an ecosystem without that species. It could be that we did not spend that, and I do not know what fraction of the current expenditure would fall into the category of “essential to keep life in Britain going”, versus something that is effectively an expression of design.

Q172 Zac Goldsmith: Just before I get on to the question I was going to ask, much of this comes down to subjective value judgments, which is more or less the point you have just made. From your point of view—and your evidence is different from the evidence we have been hearing from pretty much everyone else who has given evidence so far—at what point do you believe action is necessary? The same arguments that you make about species that were not here 11,000 years ago could be made about Japanese knotweed or any of the other species we are talking about. From your point of view, as an expert, clearly with your own set of opinions, where do you draw the line? At what point do you think action is necessary or justified?

Professor Thomas: That is a difficult question. I do not think I can answer that directly, other than by going back to what I said previously: most of the major issues that have arisen have come from species and diseases that have arrived from Eastern Asia or North America, so if I was acting on the precautionary principle, I would be cautious about the immigration of such species, but the evidence of the impact of European, and particularly Western European, species in Britain would appear to be that, on the balance of evidence, they are unlikely to cause major-scale extinction.

In plant quadrat data, both in Britain and across the world, it is true that non-native species can reduce the particular diversity of the previously local species. On the other hand, there is only clear evidence of this effect in plots up to about a quarter of a hectare in area; once you go to 10-kilometre squares, counties—I might even say constituencies—and countries, the non-native species tend to add to the total number of species in the region without subtracting from it.

Q173 Zac Goldsmith: You have answered my second point. I was going to ask if we should make a clear distinction between species coming in from afar and other species, so I will not go back to that. A lot of invasive species come through international trade; some come accidentally, unnoticed, under the radar. In our efforts to minimise the arrival of invasive species, inasmuch as you believe that is necessary, what should be the priority pathway, do you think?

Professor Thomas: The same issue really: the Far East and North America are climatically relatively similar but biologically quite distinct. I think that we should also be cautious about the development of entirely new trade routes, by which sets of species to which the British Isles may not already have been exposed could arrive.

Q174 Zac Goldsmith: Is there a particular sector that you think we should be looking at? Is it the horticultural sector or the exotic animal? Is there a particular area that you would prioritise in terms of focus?

Professor Thomas: Not really. Clearly we have an example at the moment: we have Chalara affecting Ash. The question of how we address the transport of diseases, which is not my expert area at all, is a serious one, because it would look as though those are the things that are hardest to check for, and they may have serious impacts if they arrive.

Q175 Zac Goldsmith: Are there any particular monitoring techniques that you think we ought to be using that we are not using?

Professor Thomas: Not that I am aware of specifically. Again, the import side of this is not something I have expertise on.

Q176 Zac Goldsmith: As a country, and from a European Union perspective, do you think we get the risk assessment process about right?

Professor Thomas: That rather depends on how many and which species finally end up on the lists of so-called invasive species at a European scale, and I do not know where the discussions are at the moment. I heard talk that 100 invasive species might be the limit, as to what was regarded as palatable, but I do not know how that has progressed.

Q177 Zac Goldsmith: Someone else is going to be talking about lists and numbers and so on, so I hope we get to that at some point. Do you think that the general EU approach is sufficiently precautionary, or do you think it is overly precautionary? Do you think the balance is about right?

Professor Thomas: I am not going to answer that, but I will answer a similar question—I learn from you guys.

Chair: We would quite like you to answer our questions.

Professor Thomas: In terms of precaution—and I realise this may slam into a follow-up question in a minute—I have been working particularly on the impacts of climate change on the distributions of species and how they are changing. Most species are starting to shift their distributions. It is widely recognised that the failure of species to move their distributions is going to be a major threat, because lots of species find it difficult to cross human-dominated agricultural landscapes. Lots of species find it difficult perhaps to cross

the English channel. What I am very concerned about is whether invasive species, non-native species regulations and legislation, whichever, would impair the flow of species and any conservation action to increase the flow of species to aid their conservation in the context of climate change. If we end up with a situation in which we only accept a new species on the basis of proof that it does not cause harm, then most of these potential conservation benefits will not be realised, because we are never going to be able to do all of this work to prove lack of harm.

Q178 Zac Goldsmith: Surely logically the only alternative is for a kind of managed migration. Given that there are human obstacles, the only way to overcome those obstacles would be human management, which means taking a decision as to which species to move into which areas. I wonder whether or not you think we have the expertise, the knowledge, the wisdom to make those choices.

Professor Thomas: It is difficult, but I would go back to the statement of the evidence I already gave: for 1,875 non-native species, we have not had any species-level extinctions from Britain. A high proportion of all those species are plants that cover up to about 2% of the land surface. Therefore the empirical evidence in front of me says that if we add another 1,000 species there may be a few casualties of British species, but not very many, because the native British species, virtually all of them, are geographically widespread at a global scale across Europe and Asia. The chances of any one of those species going extinct as a species is extremely small.

Q179 Zac Goldsmith: One follow-up question, and then I will call it a day. If we were to reach a point of wanting to manage in the way that you have just described, presumably the priority would be species that would otherwise risk extinction elsewhere.

Professor Thomas: Yes.

Zac Goldsmith: So you would not be talking about importing 1,000 species that are doing perfectly well elsewhere.

Professor Thomas: That would be my recommendation, yes.

Chair: I am sure you will be pleased to know that Martin Caton is going to move on to climate change related issues.

Q180 Martin Caton: What are the most cost-effective ways of controlling already established invasive species? Are there any cost-effective ways?

Professor Thomas: It depends on the species. This is very much a case-by-case thing. If you go to New Zealand, where there are large numbers of species that are threatened by invasives, their strategy is very much about keeping their native species invertebrates living by having predator-free, rat-free offshore islands. As for those cases where we do have a serious problem, let us take the red squirrel. We know that the red squirrel has been eliminated from most of mainland England and Wales, but it has survived on offshore islands on which the grey squirrel has not arrived. There is a strategy at the moment to try to remove grey squirrels completely from Anglesey and there is only the Menai bridge to the mainland, so that is an extremely good, cost-effective strategy, because once you have eliminated them it only requires a relatively small amount of attention to keep it going.

There is also a strategy being developed to try to keep the native crayfish in water bodies that the invasive species could be kept out of. That is probably going to be more difficult, but for those cases where you have a potential real exclusion, separation—separation in a defensible way, so you do not have to keep doing the management in large amounts every year—seems to be a sensible approach.

Q181 Martin Caton: Following on from that, we understand that you worked at one time in New Zealand. Are there lessons that we can learn from that country, or indeed any other countries, about how to deal with this issue?

Professor Thomas: Yes. As I say, if you can identify what the cause is of the decline or a major change, and then you set about maintaining the conditions free from that threat. In New Zealand it is so popular now that there are large numbers of communities who are themselves doing exclusion projects of rats and stoats, and so on, so that they can re-establish and maintain their native species, particularly of birds.

If we wish to keep, for cultural reasons, those few genuinely threatened native species, then we can apply such techniques. I would argue that such management, though, is not more costly than all the conservation management we do for all of our native species. We are interested in Caledonian forest, for example, so we exclude deer from certain areas. This is a herbivore that is eating young trees, so we exclude them. Similarly, if grey squirrels were a threat, we can eliminate grey squirrels from an area to maintain red squirrels, but you want to do that in a place that is isolated, where the reinvasion rate is going to be so low that it is cheap enough to do it.

Q182 Martin Caton: Do we know enough about the ecology of most established evasive species to control them?

Professor Thomas: With the 2% cover of plants, I would argue that we do not need to. There are a few of them that are clearly problematic. The famous case is of Japanese knotweed, which we all love to hate. Of course it is an absolute pain in the backside for humans, but it is not a biodiversity hazard. Its cover across Britain is negligible.

Q183 Martin Caton: Following on from that again, do you see any point in trying to control species that are already established throughout the whole country?

Professor Thomas: Only if it is changing the state of other species or ecosystems in a way that we do not want to accept within the British Isles. Again, I would argue that we might want to do it. I just would say that it is not about invasive species to me; what about bracken, what about brambles? There are various native species that we accept—ragwort, which we also have to undertake management for—and I do not particularly see the case on most non-native species as being particularly distinct.

Q184 Martin Caton: In your view, is it realistic to try to restore invaded ecosystems as required by EU regulation now?

Professor Thomas: No. I just add to that: because the climate is changing, because nitrogen deposition is going on, because carbon dioxide concentrations in the atmosphere are different, and so on, every community is already in the process of change. Well over three quarters of species that have been examined are already shifting their distributions, and therefore conservation has to become increasingly about managing change, rather than

trying to send us back to a baseline as we imagined ecosystems were, be it 100, 300 or 1,000 years ago.

Chair: I was a bit ahead of myself just now. We genuinely will now come to climate change. I turn to Caroline Spelman.

Q185 Mrs Spelman: Generally, I think you would advocate a laissez-faire approach to the impact of climate change on the distributions of these species, but nonetheless that would have to be underpinned by a proper pro and con analysis of the translocation of species. How should we assess that?

Professor Thomas: The reason I am sticking my oar in here is because the way I see it we are risking, by our actions on repelling foreign species, inadvertently increasing the global extinction rate over what we could achieve. If there is a certain number of species, let us say restricted to local areas in Southern or Central Europe that are truly endangered by climate change, if we bring them here and potentially save some of them, it would not work for all of them, and it will have some impacts on native things. My expectation—you are absolutely right, we need to think this through very carefully—is that by doing that, we save more species than we drive extinct by moving them; again, witness the fact that we have not yet, with all the non-native species we have Britain, driven any of the natives extinct. That means that we know empirically at the moment that effectively there is a less than one in 1,000 chance we are going to drive a native species extinct if we bring a non-native one in. If we are going to get serious about saving species from climate change, which I am, then my personal view at the moment is that the balance of risks are that we are going to lose fewer species by the movement than we would by just leaving them where they are and letting them take their chance.

Q186 Mrs Spelman: To what extent are the non-native species that are replacing our native plants performing similar ecosystem services?

Professor Thomas: That is a very good question, and there is very little evidence on that at the moment. If you read the biodiversity literature, the argument is that larger numbers of species in communities and regions should, in principle, increase the resilience of ecosystems to environmental change, so it is less likely that you would have forest dieback or whatever it might be. Since we are adding through non-native species new species to British ecosystems, there is an argument that we may be increasing the resilience of our ecosystems. Of course it is entirely possible that there will be circumstances in which the existing ecosystem might remain relatively similar, but with some species from elsewhere it will now shift to another state.

I would like to remind everyone that the option of no change is not on the table. There are already large numbers of new species establishing in Britain. Lots of new insects are arriving. We have many thousands of plant species already growing in our gardens, most of which would prefer the climate to be a bit warmer and drier than it is at the moment. These are very likely to be the major source of new species effectively becoming wild in Britain.

Q187 Mrs Spelman: Is your advice or recommendation that we should stop trying to curtail the non-native species that are establishing themselves here, because the speed of climate change just means that it is not possible to conserve our—

Professor Thomas: It is extremely difficult, but I would be somewhat prejudiced about where things come from, given the long evolutionary histories of separation, say, between species from the southern and northern hemispheres.

Q188 Mrs Spelman: So you draw a distinction between near non-native and far non-native species?

Professor Thomas: On the precautionary principle, yes.

Q189 Mrs Spelman: That is quite useful. Do you have any particular examples of non-native species where you think we have tended to take a rather unnecessarily negative view, and do I feel that the Japanese knotweed is about to undergo some sort of redemption?

Professor Thomas: No, it is a pain, but it is not a biodiversity threat—not at a national level because it is quite localised. I will give an example, which probably you are all going to dislike, and that is rhododendron ponticum, which is probably—I am not quite sure on the cost—but may well be close to the top, at least of the most expensive, in terms of control. So rhododendron ponticum, this is the common wild or purple rhododendron that is on every species list of invasive species in Britain.

Most of the genetic material in the British Isles appears to have come from the Iberian Peninsula, where the sub-species restricted to the Iberian Peninsula is very localised, occurs in unusual moist locations. The Iberian Peninsula is becoming hotter and drier, so it may well be threatened in the Iberian Peninsula. We have moved it to Britain, and it has done very well.

One complication is that it is hybridised with a North American species of rhododendron, which may have allowed it to do better. There is no proof one way or the other as to whether that is the cause of how well it has done in the British Isles, but it has done very successfully.

Let me play devil's advocate. If we thought the rhododendron was native, we would think it was one of the flowering glories of the British Isles, but we do not think it is native and therefore we hate it. Of course the flora underneath it is slightly different from what it would be under a deciduous woodland, without the broad-leafed evergreen rhododendron. But rhododendron ponticum used to occur in the British Isles in a previous interglacial warm period, and quite a few of the species that we see established of non-native species in Britain, and we treat as pests and wish to eliminate, have lived in Britain in the past. The rabbit is another example.

Under climatic changes, the distributions of species and the composition of biological communities is quite fluid. When I was a child I, for my sins, used to read field guides and learn the distributions of species, and I was kind of a bit strange about it.

Chair: Bedtime reading.

Professor Thomas: I thought that once I had learned them I knew the distribution but, in a historical context, particularly when climate change is going on, the distributions of species are set by the environment, the physical environment and the interactions between species. They have always changed, and under the present climate change they are changing again, and we cannot just stop the clock. In the Anthropocene, we are going to have new biological communities from separate species we have not had before. I would encourage people not to take an “any change is bad” attitude, but to say, “let us try to

identify the fights that we wish to engage in”, defined by whether they cause major changes that we are not happy about, and whether the fight is winnable.

In this context, we know what a problem the grey squirrels have been in Britain in terms of the red squirrel, and top of my list for an elimination project in Europe will be the grey squirrels that have escaped in Italy and have been spreading. It may now have gone too far to be able to retrieve the situation. If ever we see enough species doing that somewhere else in Europe, for example, then we should be, the moment this thing turns up, absolutely straight on it for instant elimination.

Q190 Chair: Just one question arising out of what you said about different species coming here. Most of your comments have been linked to the implications for biodiversity, but say you were talking about mosquitoes—and going back to what you say about climate change—what sort of consideration is being looked at for things like public health issues arising from risks, not necessarily to biodiversity but to public health or other issues?

Professor Thomas: There is also livestock disease.

Q191 Chair: So how much is there of this kind of cross-cutting approach to the implications of this, other than through the silo of the biologist?

Professor Thomas: I am not an expert on disease at all, and if I had to guess, I would say that we notice the diseases that have a large impact, because every so often we hear about a new disease, be it blue tongue or Chalara or whatever, and a lot of these seem to be very problematic, so we have the squirrel pox, we have the crayfish disease. My guess is that there are very large numbers of non-native diseases here; it is just that we do not notice them unless they have a big impact. As a pure guess—there is no evidence here, I think—it would be miraculous if all these other non-native species that we do know about, most of them had negligible impact but diseases were somehow totally different and the only ones that arrive have a huge impact.

I would guess that for our livestock and for us, we largely know the list of problematic diseases. In terms of picking fights and identifying them, again, it is not my area—I should not be on the group that does it—but I do not think it would be very difficult to come up with a list, as I am sure people already have done, of those things that we think could be problematic, which we do not currently have.

Q192 Chair: The final second of this session: you mentioned your real interest in climate change and the implications. Is there anything that you feel has not come out in our questions that you came here to say to us today?

Professor Thomas: The one final thing I would say is to be very careful that, through anything that is developed, either as a strategy or legislative framework, we do not see control of non-native species in general impairing our strategies for adaptive management for species that are threatened by climate change.

Chair: Any further comments from my colleagues? In that case, thank you very much for coming along this afternoon and for helping us with this inquiry. It might be helpful for the second lot of witnesses to know that we expect a vote at 3.15pm.

Examination of Witnesses

Witnesses: **Dr Niall Moore**, Non-Native Species Secretariat, **Adrian Jowitt**, Natural England, **Geoff Bateman**, Environment Agency and **Stan Whitaker**, Scottish Natural Heritage, gave evidence.

Q193 Chair: Thank you very much indeed, all four of you, for coming along this afternoon. We expect a vote at about 3.15, so we will proceed. First of all, if you could just perhaps introduce yourselves from your individual organisations and give us your take on this whole issue of invasive species and the concerns that you wish to bring to our attention, just by way of a very brief summary sentence of the issues that we need to be taking on board. Mr Whitaker, if we could start with you.

Stan Whitaker: Stan Whitaker from Scottish Natural Heritage. Scottish Natural Heritage spends about £1 million a year on invasive non-native species, and most of that is on controlling species that have already become established, particularly mink, grey squirrel and also some native species that are in the wrong place, such as hedgehogs in the Uists. Those definitely have shown impacts on ecosystems, on native species and on naturist sites, so that is the reason why we spend a lot of time and effort on non-native species.

Dr Moore: I am Dr Niall Moore. I head the Non-Native Species Secretariat, a small secretariat established in 2006. My main point is that it is an important area. I agree with a lot of what Chris had to say, particularly on European native and non-native species, but it is growing in importance as well, and it is an area we really need to tackle significantly in the future.

Adrian Jowitt: I am Adrian Jowitt, Principal Adviser for Species for Natural England. We are the Government's statutory advisers on nature conservation. With others, I agree: invasive non-native species are a big issue for biodiversity in this country. If there is one message, the thing I would get over is about the need to take a precautionary approach and act very quickly when something happens.

Geoff Bateman: Hello, I am Geoff Bateman. I am head of Fisheries and Biodiversity for the Environment Agency. We are unique, in that we are an operator as well as a regulator, and certainly around our flood defence operations, invasives can cause quite significant problems of flow, and other things that you will be well aware of. But also in compliance with the Water Framework Directive we are charged with aiming for good status, and invasives have the potential to cause significant problems. We choose our battles but we also adopt disproportionate costs, which is part of the answer to the question about how you choose your battles.

Q194 Chair: For the record, would you say there were big differences between Scottish Natural Heritage and Natural England in terms of the approach towards this?

Adrian Jowitt: No, I do not think there is. I think the way it is organised in Scotland is slightly different at the moment but, other than that, we would have a general approach that we agreed with each other that invasive non-natives are a big issue.

Q195 Chair: But the roles that you have are roughly the same in respect of the remit that you have?

Stan Whitaker: One step that we have taken in Scotland is the organisations that have powers and responsibilities on non-native species are Scottish Natural Heritage, the Scottish Environment Protection Agency, the Forestry Commission and Marine Scotland, and we have agreed a framework of responsibilities, which ensures that roles and responsibilities are clear, with SNH taking the lead on open ground habitats and wetland habitats, SEPA, the Forestry Commission and Marine Scotland covering fresh water woodland and marine habitats.

Q196 Chair: I know that you all sat through the previous session that we just had, and it would be very useful for us to know whether or not there are points of agreement or disagreement, and whether or not there are issues that you particularly wish to respond to, in terms of what we just heard in our previous session.

Geoff Bateman: Yes, specifically, there is not very much that we disagree with. I think invasives is a matter of time, and timescale is significant in this. If you act quickly you can eradicate invasive species that could cause harm, but it depends on how well you carry out the risk assessments and undertake that kind of monitoring surveillance and research into pathways. But in terms of cost, disproportionate costs is something we borrowed from the Water Framework Directive. It is not just a costs and benefits exercise. If the cost in dealing with the invasive is going to be more than the amenity or the activity or the process you are protecting, then there is a balance that at least gives you some information about whether to take action and when.

Dr Moore: Just a quick one about European non-native species. I do agree with a lot of what Chris said. I was just looking at some of the figures the other day, and up to about 1950, 56% or so of the non-native species that were becoming established in Britain were European non-natives, but since 1950 that has dropped to 26%, so now 75%—effectively three quarters—of them are from further afield, which are the ones we were more worried about, and they are definitely more invasive than the European ones, so I definitely agree on that point.

Chris said that nothing has gone extinct yet. I beg to differ with that. I was talking to Plant Life and they said their starfruit is probably going to become extinct due to *Crassula*, which is New Zealand pygmy weed from the Surrey and Berkshire heaths. Some of those species, of course, we are keeping going. The tansy beetle in York is a beautiful little metallic green beetle and is only found in tansy. Tansy is threatened by Himalayan balsam and without active intervention that species is likely to go extinct. Himalayan balsam first turned up about 1850 so it is only now that it is threatening a species, 160 or 170 years later. It is all about time, so in 100 years' time we will have far bigger problems.

Stan Whitaker: Just one point about conservation translocations in the face of climate change. What Scottish Natural Heritage and others are doing is interpreting the IUCN guidelines on species reintroduction and translocations for Scotland and, as an example, the Royal Botanic Gardens in Edinburgh have an ex-situ conservation introduction programme for rare and threatened conifers from around the world. Planting goes on mainly in arboreturns and plantation woodlands, but plantation woodlands are definitely in the wild, so SNH licenses that. We go through a rigorous risk assessment process, as we would for any other species introduction under section 14 of the Wildlife and Countryside Act.

Q197 Chair: Native invasive species or non-native invasive species: which would you say are the biggest issues that we have to deal with, in terms of priority?

Geoff Bateman: For water it is the non-native invasive species, aquatic invasives.

Chair: You are all nodding.

Dr Moore: I would agree. Even things that people complain about, like nettles, for instance: a whole suite of the butterflies that we like are dependent on nettles, whereas Himalayan balsam does not have anything that we want that depends on it.

Q198 Peter Aldous: Dr Moore, I am looking at you on this one: a new British non-native species strategy is currently being prepared. I would welcome an update on how that is progressing and what changes are likely from what was done in 2008. In that respect, how have the challenges changed in the last six years?

Dr Moore: The review of the strategy started last September, so the secretariat is assisting with that. I think there have been six workshops with stakeholders in various meetings that DEFRA have held with them, and they have taken lots of evidence. We also put it out to peer review from two external international experts. The feedback from that was pretty good. We are ahead of things in Europe but we do not need to be complacent. It is an important first step, and going forward, we need to be far more ambitious. A step-change, as I think the Environment Agency said at one stage, is what we need now.

Yes, we have the framework in place but we need to take it from there and go up to the next level. I would hope that the strategy will reflect that.

Q199 Peter Aldous: What are the challenges that you face today that you did not face in 2008?

Dr Moore: More species, particularly the Ponto-Caspian species, are turning up virtually annually at this stage or maybe several per annum. Also some areas in the strategy that we have lagged behind a bit in are strategic research and pathway analysis, so prevention is key, as we know; but we have lagged behind on pathways a bit and in our analysis of pathways.

Q200 Peter Aldous: Do you think the new strategy is likely to differ from the draft EU regulations at all?

Dr Moore: I think the two will have a similar approach, with the stress on prevention, early warning, rapid response and finally long-term management and control. There is a lot of synergy between the two and we are already doing a lot of the stuff that the EU strategy calls for, like risk assessments. We have the most comprehensive risk assessments in Europe by far. But, yes, I would think there would be a lot of overlap between the two.

Q201 Peter Aldous: Is there a problem, given there might be a difficulty that you may be diverting effort into dealing with a list of European invasive species that are not necessarily a problem here?

Dr Moore: With the negotiations in Europe we have tried to endeavour not to be saddled with a whole lot of issues that are more a European concern, so for instance having to eradicate grey squirrels, which clearly is impossible. *[Interruption.]*

Chair: We will adjourn. We will return as soon as we can after the vote.

Sitting suspended for a Division in the House.

On resuming—

Chair: We are ready to recommence. We were in the middle of a series of questions from Mr Aldous, so back to you, Mr Aldous.

Q202 Peter Aldous: I just had one more. The proposed EU directive does not envisage action on invasive species that are native in other parts of Europe. Do you think that is going to cause us a problem here?

Dr Moore: Potentially, yes. The main thing we are worried about, once again, is these Ponto-Caspian species, the species from the Black Sea and the Caspian Sea, which have been coming over slowly but surely, and we are getting a reasonable number of them now. The UK's position is that we want EU natives included, but the latest proposal I have seen from the presidency has suggested a third list, a different type of list, which is a regional list. That could potentially include native EU species, and it would force member states to do things like pathway action, monitoring and surveillance, and management, which is exactly what we need. If that stays in the text, I think we will be satisfied, yes.

Peter Aldous: All right, that is fine. The others have had an opportunity within the interlude to think about this one. Do any of you have any comments?

Adrian Jowitt: We have been feeding in through Niall.

Peter Aldous: All right, thanks very much.

Chair: Thank you. We will move on to Dr Whitehead.

Q203 Dr Whitehead: We have touched on this in our discussion so far, but could I get a better feel of what your organisations do in terms of monitoring and surveillance of potential invasive species? In setting out what you do, obviously you have very substantial other roles in your organisations as well as watching out for invasive species, I would imagine. Therefore, there is a question of what sort of choices you take within your organisations on what sort of resources to allocate and, indeed, what level of priority you might give such activity within everything else. How does that work in terms of the resource and activity you provide? Is that, in your view, sufficient for what you know are the purposes in front of you?

Adrian Jowitt: I will go first. We do a number of different things around invasive non-natives. You mentioned specifically monitoring. We do monitor as part of our work around monitoring of SSSIs—sites of special scientific interest—and also on our national nature reserves, particularly those in the south where we might do special monitoring if we were looking out for a particular pest or invasive species that may be coming in.

We sit on the GB programme board, so we are part of that along with other colleagues. We have a statutory role to do with licensing under the Wildlife and Countryside Act, section 14 and that type of thing. We also have an operational role. We are identified in terms of rapid response if a species comes in that is having an impact on terrestrial biodiversity. That would be Natural England to lead the co-ordination on that. We also carry out control on national nature reserves and protected sites.

Some of that work, to pick up your point about how we prioritise, would be cross-cutting, because things like carrying out control of invasive non-natives on protected sites and national nature reserves would be a requirement in terms of SSSI conditions as well. There are those types of things. It is always quite difficult in terms of balancing different priorities. Some of this is stuff we would like to do. One of the big issues around something like a rapid response is the requirement to quickly mobilise resources within year, and that would be a problem for any organisation. A rapid response requires just that and we have not had that requirement as yet, but it is something that I think we need to be aware of. If something needed a quick mobilisation of resources, that could be quite difficult.

Geoff Bateman: From the Environment Agency's point of view, as I was saying before, it is really in support of our main functions, and if invasives cause interference with the operation of our functions, either our flood defence, water quality, water resources, fisheries or biodiversity functions, then we would concentrate on those invasives that were causing either social, economic or environmental harm in that respect, or difficulty in achievement of environmental standards.

Q204 Dr Whitehead: Would you have an in-house list to guide your work before you have even started on that?

Geoff Bateman: Yes. With the Invasive Species Secretariat we look at the risk analysis of where species might be. We have plenty to deal with at the moment, but somewhere between 30 or 60 we concentrate on. In particular, fish is a specific economic, social and environmental duty that the Environment Agency has. We are doing an eradication programme for topmouth gudgeon, for example, and that we concentrate on.

Q205 Chair: Just before you move on to the response from the other members of the panel to that question, could I ask in terms of the Environment Agency's remit where the funding for the work that you have just outlined fits, in relation to the priority of allocation of resources of the Environment Agency within the current reduced amount of funding that they have to work with?

Geoff Bateman: We put a very small amount of funding into invasives directly.

Q206 Chair: How small?

Geoff Bateman: £2 million.

Chair: As a percentage?

Geoff Bateman: That does not include flood defence operations for maintenance, if waterways get blocked and sluices cannot operate and so on. It is about £2 million. We do

specific monitoring surveillance for *dikerogammarus*, the so-called killer shrimp. We are containing that, in the sense that it does not seem to be spreading out of the four locations we have found it in. It is very minimal in terms of our environmental monitoring and surveillance. We really depend on the third sector helping us to find out what is going on. In fact, the killer shrimp was found by one of my staff going fishing in Grafham Water and the shrimp just happened to be all around him. That was the first time it had been noticed.

Q207 Chair: How does that funding that you have now compare to the previous year and the future year?

Geoff Bateman: It has been around about £2 million for the last three years.

Chair: Okay. Sorry, Alan.

Q208 Dr Whitehead: Thank you. Yes?

Dr Moore: All my work is related to invasive non-native species, so that is all we do. The secretariat runs the risk analysis mechanism, but we also are involved heavily with the alert scheme. For instance, I have brought along a few Asian hornets just to show people if they wanted to see them today. One of them is a queen, so it looks rather nasty and large. They are doing a contingency exercise up in York today and I would be at that if I was not here. Having an alert system, as far as I know, is pretty unique in Europe. We are the only ones to run this at the moment. It involves people like beekeepers, and sentinel apiaries where they are asked to watch out for this, and we send out promotional material saying, “If you spot this, let us know straight away.”

Stan Whitaker: In Scotland, I have already said Scottish Natural Heritage spends about £1 million on non-native species control, and that is out of a total grant-in-aid budget of about £53 million a year.

In terms of monitoring, again we rely very much on citizen science monitoring. We have put money into, along with the Environment Agency, an invasive species app for mobile phones, so we are hoping to get more records that way. A lot of our monitoring also comes through national recording schemes like the Botanical Society of the British Isles and so on.

In terms of rapid response, obviously we do not have a contingency fund for funding these things, but we prioritise on a case-by-case basis. The other thing that we do have is a contingency plan for muntjac deer, which are not currently in Scotland but are very close to the border. That is one area where we feel that we can make some progress in terms of putting in place contingency plans for when things arrive, so we have the response in place and we will be able to respond much more quickly.

Q209 Dr Whitehead: The European regulation arrangement is looking like it will require some pretty detailed analysis of pathways for the introduction of non-native species. I presume what you have described as your monitoring and surveillance would look at how those pathways would work as far as your work is concerned, and would work on updating risk assessment elements of those pathways. Is that right?

Dr Moore: DEFRA at the moment is funding a project, and has been for about a year, looking at the pressure coming from individual pathways, including some rather strange and obscure ones—things like prayer release and stuff. I think there are about 37 pathways and various sub-pathways as well. Pathways are very complex because, for instance, if you look at the horticulture trade, we have 17,000 or so non-native species and types in the horticulture trade in Britain. Most of them do not cause a problem, but about 10 or 12 years ago there was a tree fern, a cycad, coming in from New Zealand and Australia. Just one genus of trees being imported had something like 340 individual species of non-natives stuck in the bark, which was really frightening. We have only had 2,000 species in the whole of the history of introductions and here we were getting 300 on one genus. Luckily, our plant health authorities noticed this and contacted and dealt with it via the plant health authorities in Australia and New Zealand, but that could have been disastrous.

Stan Whitaker: One thing I should have mentioned was a pathways analysis that is going on in the marine pathways project that we are just a partner in. It is a GB and Ireland project and Cefas has done some work in identifying and analysing the pathways of spread into Great Britain and Ireland. They are currently refining that analysis. We have also been trialling some surveillance networks, both onshore—looking at marinas and agriculture sites and ports, places where non-native species are likely to arrive first—and also an offshore network using the offshore buoy network to try to pick up things that are in the wider environment. That is partly to discharge our duties towards the marine strategy framework directive monitoring.

Q210 Dr Whitehead: Do you think the regulatory risk assessments work as fast as they should? We have had evidence from previous witnesses that there are concerns about the slowness of that process. Indeed, bearing in mind the changes that are taking place, by the time we have done the risk assessment things may well have moved on.

Dr Moore: Yes, I agree entirely. It does not work as fast as we would hope. The mean length for risk assessments—we were looking at the data—is about two years. The minimum length you can get away with for a comprehensive risk assessment, because there are so many checks and balances and there is peer reviewing and going through a panel, is about 16 months. We have recently developed a shorter risk assessment, which we call a rapid risk assessment. That can be done in a few weeks. For killer shrimp, that was the case. It was done effectively within about a week, so we knew the risk from that was pretty high and we knew then to pass that information to the agency to act.

Geoff Bateman: It is more or less on a no regrets basis, so that you are not expending huge amounts of money but you are monitoring what you do and then seeing the impact of what you are doing. You are getting that feedback loop all the time.

Q211 Mark Lazarowicz: I am exploring what you have been discussing about the most cost-effective way of using resources that are available. When it comes particularly to managing and controlling already established invasive species, what would you say are the most cost-effective ways of approaching that particular objective?

Adrian Jowitt: The starting point in some things is to say that managing ones that are here and established is very, very difficult. We all know that. There is therefore a need to act

quickly, and that is why that is the case, and for prevention—trying to build in a change in our culture to this sort of thing, so that they do not even get here.

In terms of how we deal with them, it is about picking our fights, as Chris said earlier on, and being very clear about where there is an economic benefit to tackling some of these things, because they will cost a huge amount of money. In terms of what is most cost-effective, there are all sorts of ways we can do it, but there is some really interesting work going on. I think you have probably had evidence from other people about it in terms of biological controls and pursuing that line. If we could pursue that and we could put the money into the research around that, once we can get those established, we could really change.

There is an example that I was given. I cannot remember the particular species or the countries involved, but effectively it was a species that came from South America that was established as an invasive species in another country. In that country that it was in, it was a really big, invasive shrub. It took three attempts to find it in its natural habitat, and when they did, it was a small plant. The basic thing was that the pests, the things that predated on that plant in its natural environment, were not there in the country that it had become invasive in. If we can get some form of biological control that brings them down, that would be very cost-effective.

Q212 Mark Lazarowicz: It can only be in a very limited number of cases, by definition very limited and extreme cases, when you are going to pursue eradication, because once it is established, the cost-effectiveness is presumably much less.

Dr Moore: Over the years, we have not done it very often. I think pick your fights is definitely the way to go. Ruddy duck is an important example of one case where we have gone for national-scale eradication. It has cost about £5 million to DEFRA, but that is over about 15 years. It is highly successful. It is a world leader in terms of eradications, but we were doing the same back in the 1980s with coypu and even back in the 1930s with muskrats. We have saved ourselves enormous problems since then by eradicating muskrats in 1939 after seven years, whereas in the Netherlands now they kill something like 400,000 of them per year. We killed 4,000 of them in the 1930s and we got rid of the problem.

Bio-control is an important issue as well, but I think it is also useful to harvest the keenness that members of the public have and get volunteer effort in. We have collated something like 130,000 hours of volunteer effort into controlling non-natives and also educating people on that as well. It is a very useful way of getting cheap labour out of people and getting people involved.

Stan Whitaker: Two points from me. Address problems at an appropriate scale in defensible areas with appropriate biosecurity mechanisms. For example, with our mink project, it is a landscape-scale. With invasive plants, it is very often catchment-scale, because they are spread by water. With rats, swimming distance between islands and the mainland is quite important, so they cannot swim back again.

The second point is to maintain links with and apply lessons from research. For example, in our mink projects, Aberdeen University and the Game and Wildlife Conservation Trust

research has very much guided our strategy: population modelling to establish presence of breeding populations, and network to map migration routes and likely re-invasion routes.

Geoff Bateman: I agree with everything that has been said, but do not underestimate communication and promotion of the problem. We are using rod licence money that is paid by anglers to ensure that some waters in East Anglia are kept clear from weeds, so that anglers can get the bait in the water so that they can fish. They are quite happy with that money being spent in that way. Providing we communicate it with them and explain what we are doing, they are very happy. Anglers themselves spending a lot of time in waters tell us what is happening in still waters and in rivers.

Q213 Mark Lazarowicz: Is there anything in particular that you think you have learned from eradication programmes of already established species from other countries—anything which is a particularly good lesson to draw, or something that you definitely should not do? I appreciate there will be a vast variety of responses, but is there anything in particular we have learned from elsewhere in the world that you would like to draw to our attention?

Dr Moore: I think for eradication you need to sustain your effort. There is no point in doing it for a few years and then saying, “Oh, we have nearly done it” and abandoning that. That would be a wasted effort. Having some clear lead agencies is very useful as well, and I think we need to get away from waiting until things turn up and become a big problem. We need to go towards rapid responses, of which we are doing quite a few, particularly in the Environment Agency and Natural England. Some have already been successful. Also, contingency planning: having been ready and alert for something to turn up; for instance, with the Asian hornet, we have staff trained. They are ready to go. They are equipped and we have an alert system in place. We might not keep it out, but if we do not try, we will not succeed.

Adrian Jowitt: Yes, I would agree with the point about very clear lines of responsibility and clear leadership around it. On the point about the continued resources, if you are going to sustain your effort you need to be sure that you can maintain resources financed to do that over time. That is obviously quite difficult to plan over multiple years, even if you have the opportunity to act. We are doing a project at the moment on bullfrogs and finding money to plan three years in advance to be sure you will have the money to finish the job in three years is hard.

Q214 Mark Lazarowicz: On a slightly different focus, finally, I understand the proposed EU regulation requires the restoration of invaded ecosystems. Is this something that has been done with much success?

Adrian Jowitt: For most habitats, in terms of restoration, we know quite a lot. There are gaps. Interestingly, in the case of invasive species, we do not always know all the impact of the species. The obvious one is that in the case of a plant species it may invade the space, but it may change the soil biology and the soil fauna and things like that. Even when you have removed the plant, we do not fully understand the impact of it once it has been taken away.

We have talked about how we eradicate, and you have asked what the best ways are of dealing with it when it is very well established. That is one of our big areas, a gap. The

first thing you need to do to restore the habitat is to remove the invasive species, and if we do not know how to do that, we cannot do step one. If we can remove it, our knowledge of habitat restoration is pretty good in most cases.

Q215 Mrs Spelman: To what extent can tackling invasive species make it more difficult to meet your organisation's other objectives? You have quite a substantial range of objectives in many cases. Is that affecting the overall objective? You all have different objectives, but is it proving a distraction?

Geoff Bateman: Well, in every case you have to balance dealing with the invasive against what the prime objective may be for that particular location or community or landscape. By working together and using public funds sensibly across our organisations and particularly with a GB focus, I think we are able to agree on priorities that make sense.

Adrian Jowitt: Yes, I would agree with that. Through the GB programme board, we have worked in partnership with all the agencies, and the other agencies are working in partnership together to make sure that we are making the best use of our resources. Earlier on I mentioned, in terms of what Natural England does, that some of this is cross-cutting. We are doing stuff on invasives through the agro-environment schemes, for instance. At the moment there is about £2.4 million of money going into it as part of agro-environment schemes, so that work is picked up there. We also have a budget to spend on WFD stuff, which is specifically aimed at protected sites. We have £450,000 under that one. Other than the licensing, we do not have statutory duties. Obviously, in terms of priorities, which I think is slightly where your question is coming from, those things that are a statutory duty for us to do and to discharge take the priority. They have to.

Mrs Spelman: Absolutely. I would expect that. That is the same for the rest of you, I should think, yes.

Geoff Bateman: Can I just make a point about biosecurity as well? For all of us who work in the environment, we have people going into the environment and working in different water bodies, and on different land. Biosecurity is the key, and that is fed into all of our monitoring and surveillance activities for other activities that we undertake for our statutory duties, so that we are aware of invasives being transported at all times.

Adrian Jowitt: Yes, and we have built that now into our contracts. For any contract we are setting up for people to carry out work on SSSIs or protected sites we have built a biosecurity requirement into those contracts that all contractors must observe those standards.

Q216 Mrs Spelman: I think you have answered the second part of my question there with regard to the Government's plant biosecurity strategy, because essentially what you are telling me is that there is a case for developing regulations on invasive species in tandem with a policy on biosecurity. You have to have the two things running together.

Dr Moore: That is biosecurity at a different level. I think you are more talking about biosecurity at a local operative level, whereas on biosecurity at a national or at a GB scale, it is fair to say that currently DEFRA is looking at all the risks posed by biosecurity issues in the round—not only animal health and plant health, which get a lot of looking at, but

also invasive species and bee health, and looking at coming together and comparing all the risks posed by all the different threats in each sector together, which I think is very good.

Q217 Mrs Spelman: Yes, which is this part. I have a little cluster of questions about the use of poisons, pesticides and herbicides against invasives. To what extent do you think they bring collateral damage at the same time? Okay, it might get rid of the invasive species, but then it can affect the water quality; it can affect the soil health.

Adrian Jowitt: It is a very good point, and there is a need for balancing the long-term and short-term desires around that. We have had a recent case around oak processionary moth, which as you are probably aware is an invasive. It was preying on oak, obviously, and it also potentially has human health impacts. Although it is established in some of the parks in London, there was a population just outside of London. The response to that was that the Forestry Commission applied to do aerial spraying with a lepidopteracide on a site of special scientific interest. Obviously, you have a woodland site that you are going to spray a lepidopteracide on, but the oak processionary moth is not the only lepidoptera there. There was a challenge. At Natural England, we allowed that. We licensed that and said yes, that could happen, but there is a balance to be done. We have to make a decision on the long term versus the short term. Interestingly, in something like that there are societal choices as well, because it may be a perception about the use of the chemicals, rather than always a scientific or an evidence-based view.

Q218 Mrs Spelman: Absolutely. There are some restrictions on the use of certain chemicals, sometimes the only chemicals that we have to combat an invasive species, and even a native one. Do you think there are any particular problems for controlling invasive species that arise from those restrictions? Do you have examples of that? I do not think I can supply one, but I am sure you can.

Geoff Bateman: I can give you two examples. One is glyphosate, and we are working with the industry to ensure that we get more specific, so that the material cannot be washed off easily. We are doing some research, but the standard for water quality is an annual average. Sometimes the use has to be enough to kill the plant and, therefore, it could kill other plants as well. Perhaps a better one is rotenone and the use for the eradication of topmouth gudgeon. The point there is we would only use that or have only used it in enclosed waters, and generally in commercial waters where it is having an impact on the commercial viability of a fish farm, for example. The fish farmer would pay for some of this, although most of it is done voluntarily. There we would fish out elected fish and remove other species, leaving the topmouth gudgeon there, so we reduce the impact on other resources. The decision must be made that if there is too much collateral damage you do not carry out that method. You do not use the poisons; you use mechanical means or you use other means.

Q219 Chair: Just before we leave altogether this issue of biosecurity frameworks, which Caroline Spelman just referred to, can I follow up with you, Dr Moore, a little bit on how you see those frameworks, including the effects on humans, being integrated with the whole issue of invasive and natural species? We have covered animal and plant health but not so much human health. I do not think we have had much evidence on this either.

Dr Moore: Our risk assessments do have a slot for human health. They look at the environmental impact, the economic impact and the social or human health impact. We think that is important as well. One of the reasons we are responding to this little chap is the fact that if it gets to Britain it will definitely kill people. It has killed six people approximately in France to date, about one a year. Not a huge number but still worrying. We do take account of human health, certainly in the risk assessments, but I think we need to be more integrated, yes, definitely, on the human health side.

Q220 Chair: How would that integration come about? What would need to happen? Do you have members of your group, say, including environmental health officers, for example?

Dr Moore: No, we do not have links. What we could do is incorporate people from Health Protection England—I am not sure what the current bit of Government is—perhaps on the GB non-native species programme board to which I report. That could be a way of doing it there.

Geoff Bateman: If ever we are using poisons to deal with invasives, we certainly involve the Environmental Health local authority, so we let them know. If there was any danger from invasive species, then we would be talking to them as well: keep away from the water and so on. We would ask the health professionals to give their advice.

Q221 Chair: Right. Do you feel that they are sufficiently proactive in this discussion to the level that is needed? Where does the whole issue of integrating the lists fit into this?

Geoff Bateman: I think we have some work to do on this.

Q222 Chair: Who has?

Geoff Bateman: We all have, and the health professionals.

Q223 Mark Lazarowicz: A question, first of all, to Mr Whitaker. We know that the Law Commission in England are proposing that the Government adopt the system of species control orders that already exists in Scotland for England and Wales. How widespread is that system now used in Scotland? How important has that been in the strategy that has been adopted by yourself and the other agencies towards invasive species?

Stan Whitaker: The change in the Wildlife and Countryside Act that brought in these new powers came into force in July 2012. To date, we have not issued a species control agreement. We are in negotiations with one case at the moment. One of the reasons we have been taking it quite slowly is because we want the first case to stand, so we have been taking advice from our solicitors and so on.

Q224 Mark Lazarowicz: Just to be clear, if you can get an agreement that does not require an order to be put in place, the agreement is then presumably legally binding on the landowner or other interests concerned?

Stan Whitaker: It is. If the agreement is not adhered to, then we have the option of either modifying the agreement or moving to a species control order. What we did not want to do was to get into a position whereby the agreement had been partly adhered to but there was

a loophole that would mean that for whatever reason we could not move to a species control order. It is really following on from our experience with deer control agreements and orders in Scotland that we felt that we had to get the agreement process right before we start to tackle things through orders. To that end, it is very important that we set clear targets and time-limited targets, and have robust monitoring, so that we can show that the objectives of the agreement have or have not been met, which might be to remove or eradicate a plant, or to enclose a zoo animal that is free-living and make sure the enclosure is secure and there are no animals living outside the enclosure.

Q225 Mark Lazarowicz: Compared with the use of deer control agreements and orders, how extensive do you expect your use of the species control mechanism to be?

Stan Whitaker: Initially, we saw species control agreements and orders as a mechanism of last resort, and thought that we would try to negotiate through a voluntary approach before we moved to a species control agreement. As an example of that at site, American skunk cabbage was spreading from a garden in Strathspey into Insh Marshes, a special area of conservation and special protection area. The RSPB, who manage the reserve there, had not been able to persuade the owner of this plant to do anything about it. I think they had been trying to persuade them to remove the plant altogether. With the promise of a voluntary agreement in the offing, we agreed that by removing the flower heads, basically, after flowering, stopping it seeding, the problem was solved. We felt that having those powers helped to crystallise things.

We are moving now towards seeing species control agreements as being a useful tool to formalise where action needs to be taken. Examples of where we are likely to use them in the future are to support rapid response cases. The example I have just cited there of free-living animals in a small zoo would be somewhere where we could go down the route of a prosecution but we would rather resolve things on a voluntary basis because it is basically cheaper. We would offer a control agreement just to be absolutely clear what has to be done by when, because very often these cases can run and run, if you let them.

The other case where we are likely to use them in the near future is in support of these catchment-scale co-ordinated approaches to control, particularly for invasive plants where you have a stand of rhododendron that is left next to an area that has been cleared and acts as a seed source. In the past, we have had projects where we have been unable to tackle those seed sources, because we could not get access to the property. Either we did not know who the landowner was in some instances, or it is somebody's garden and they like their rhododendron. In the future, we would potentially have the ability to offer an agreement and part of that agreement was that we would carry out all the work. We would offer to replace like for like with a similar plant that was less invasive.

Q226 Peter Aldous: I was just going to look at how we might apply these orders to England and Wales, but just one thing, Mr Whitaker. The plant you were describing in, I think you said, Strathclyde—

Stan Whitaker: Strathspey, yes.

Peter Aldous: Scottish Natural Heritage does not have powers of step-in if there is a problem, so that you go on site yourselves and address it?

Stan Whitaker: Yes, we do for sites of special scientific interest, for example. We do through nature conservation orders through the Nature Conservation Act, but in this example, the plant was growing in a garden outwith the site, seeding into a stream that flowed through this person's garden and out into the important European site.

Q227 Peter Aldous: Could you have gone into their garden to have addressed it?

Stan Whitaker: Not through our existing powers, no. The only way we could have addressed it was through getting the police to take legal action, but that would not necessarily have ended up with the plant being removed.

Q228 Peter Aldous: Would you not have liked what I would call step-in powers to go and address this situation where time is of the essence, so to speak? Could this be a deficiency or limitation in what powers you have at the moment?

Stan Whitaker: For SSSIs, potentially that is outwith my field where I work at the moment. Effectively, we have those powers for non-native species because we have the powers to make emergency control orders, in which case, yes, we can go in and take access to control something. If the relevant body can show that it is urgently necessary to prevent something becoming established and spreading, we have those powers, yes.

Q229 Peter Aldous: Looking to Mr Jowitt and Mr Bateman, I just wondered how Natural England and the Environment Agency are looking forward to the possibility of having these new powers. Is it something you relish? Do you think it is going to make a difference?

Adrian Jowitt: We think they will be a useful tool in the armoury, yes, and we said so in our evidence to the Law Commission. We were recommending them. It is for DEFRA to decide whether we get them in place, as I understand it. There are situations currently at the moment—and monk parakeet springs to mind in North-East London—where the eradication is not completed because we cannot gain access to the main colony in a garden.

Geoff Bateman: We already have powers of entry under the Water Resources Act, the Salmon and Freshwater Fisheries Act and the Import of Live Fish Act to go on to sites. We have to be careful because public authorities going in and then taking action will spend money, and it could be huge sums of money. You really need to be very clear that you are going to be able to recover some of these costs if you do that kind of action. In our experience, in the whole of the topmouth gudgeon exercise, only one fish farm owner gave us any problem at all. Everyone else wanted to do it voluntarily. We communicated in the right way. It is a much better action to do it voluntarily, but we do need a back-stop in extremis. Where we do have one last problem on a catchment or a river or in the country, we need to get in.

Dr Moore: Yes, I agree. I think powers of entry are very necessary. Another example is ruddy duck. I was talking to the guy in charge of the ruddy duck project a few weeks ago. I used to manage him many years ago and he said that not having powers of entry has delayed the programme by about two years, which is a cost of a few hundred thousand pounds.

Q230 Peter Aldous: Do the Law Commission's proposals give you sufficient powers to investigate the possible presence of invasive species as they stand?

Geoff Bateman: Well, from our point of view, we would only be investigating on the basis that it was part of our other duties and powers to investigate invasive species, so yes.

Adrian Jowitt: Yes, as I understand them. I am not an expert on them, but as I understand them, yes, it would.

Q231 Peter Aldous: To accompany the regime that is proposed by the Law Commission, would the roles of the Environment Agency and Natural England be clearer if they also had a statutory duty to investigate and institute control orders on problem species? Would that help?

Stan Whitaker: One note of caution there would be on the Japanese knotweed situation. One of the things that we have to be quite clear about is that SNH is not responsible for managing invasive species on other people's land. Land managers are responsible and there is no legal requirement for them to do so. It is only when we deem that they are a threat to either a catchment-scale project or something becoming established and spreading that we will make any agreement or order. We make it very clear it is not within SNH's remit to intervene in neighbour disputes about Japanese knotweed, for example.

Q232 Peter Aldous: How will species be prioritised as to whether they are given a control order or not?

Adrian Jowitt: Control orders, as I understand it, are on a site-by-site basis, so it would be on a site. The situation where they would be useful is rapid response. That would be the real one. I completely agree with Geoff. Obviously, we would wish to do it through communication and getting people on board, but it is about having those powers to go on if it was necessary in a rapid response, and also in the situation just referred to of a catchment, where you were trying to do something on a whole-catchment area. They are not something that would be used day to day. It is a back-stop. I think the fact that they are there helps with the discussion in the first place. They are also a continuum, aren't they? You start with a conversation. You then go to an agreement and they are really there just as a last resort. It is so that you do have somewhere to go. You have a last resort. You can say, "We have the means to do this if necessary".

Dr Moore: One of the species they would be vital for is something like an Asian hornet. I am sorry to bring it up again. We have a contingency plan, we have staff trained, but if this thing turns up and we do not know on whose land it is, we can sit there and twiddle our thumbs and do nothing. Having an emergency species control order, so that agency staff can go in and take action, is what we need, definitely.

Q233 Peter Aldous: This is my last question. I will look to everyone, but also to Mr Whitaker for guidance on how it is weighed up in Scotland. Concern was expressed by the Law Commission in their consultation about the imposition of burdens on landowners, and whether these would be onerous and burdensome or not. How would Natural England and the Environment Agency go about assessing the proportionality of a potential control order?

What lessons are there to be learned from Scotland about what you are doing so far? Would you like to go first, Mr Whitaker?

Stan Whitaker: Yes, certainly. We assess each situation on a case-by-case basis, which is proportionate. As part of our guidance, we insist that the relevant body makes an assessment, that a test of reasonableness is applied, effectively, which I think is in the Law Commission recommendations. Then it just comes down to what our priorities are. Our top priority is preventing spread and establishment and then support for the voluntary approach, support for co-ordinated, cost-effective, catchment-scale approaches, and I suppose also maybe for protecting strategic resources like sites of special scientific interest or a particular water body that is failing a Water Framework Directive target.

Q234 Peter Aldous: Any concerns from the England and Wales position?

Geoff Bateman: We have experience already of waste disposal, for example, on land, and landowners are often caught with that problem, but the responsibility does rest with landowners to take responsibility for what is occurring on their land. We would take a similar approach. It has to be proportionate. Disproportionate action is just nonsensical. It is about taking the community and the landowners with you. We will fall out occasionally, but we do not fall out very often.

Chair: Okay, there we must leave it. Can I thank each of the four of you for the benefit of your expertise this afternoon, and for being patient with us during the Division? Thank you very much indeed for coming to give evidence.