



HOUSE OF LORDS

Environment and Climate Change Committee

Corrected oral evidence: Nitrogen

Wednesday 23 April 2025

11.05 am

Watch the meeting

Members present: Baroness Sheehan (The Chair); Lord Ashcombe; Lord Duncan of Springbank; Lord Jay of Ewelme; Lord Krebs; Lord Layard; Earl of Leicester; Lord Rooker; Lord Trees; Baroness Whitaker.

Evidence Session No. 12

Heard in Public

Questions 87 – 94

Witnesses

[I](#): Dr Tony Juniper CBE, Chair, Natural England; Rob Cameron, Deputy Director of Strategy, Natural England.

Examination of witnesses

Dr Tony Juniper and Rob Cameron.

Q87 The Chair: We are delighted to welcome, for our second panel, Dr Tony Juniper and Rob Cameron from Natural England. I will go straight into our first question, which will be from Lord Trees. When you answer, please introduce yourself and your role.

Lord Trees: Thank you very much, both of you, for coming and giving us the merit of your experience. There are complex and numerous causal factors resulting from the state of nature in the UK and our biodiversity loss, but could you summarise the extent to which nitrogen pollution has been involved in those losses?

Dr Tony Juniper: Good morning, and thank you Chair for the introduction. I am the chairman at Natural England, the British Government's adviser on the natural environment in England. We have a very wide range of duties, some linked to the business of this committee. Let me say how welcome it is to have a focus on this subject; it is a systemic challenge that ranges across a whole wide range of environmental questions that receive far too little attention.

In relation to your question, Lord Trees, the statistics speak of the scale of the challenge. Our estimates conclude that, of the nitrogen-sensitive habitats in this country, 99% are exceeding a critical load of nitrogen, causing ecological change which is broadly damaging to the integrity of those places. In relation to the protected areas, the sites of special scientific interest, about two thirds are exceeding critical loads.

There is a range of environmental consequences that come from those loads being exceeded. One is the process of eutrophication, which you see in freshwater bodies. This is the nutrient-driven expansion of algae that then causes oxygen depletion and a range of consequences that come in its wake; nitrogen deposition, for example, falling on to grasslands and heathlands, changes the vegetation in ways that diminish the interest. This is a very widespread problem causing profound ecological change.

It is interesting to note that the amount of reactive nitrogen now circulating in the environment compared to pre-industrial times has pretty much doubled, whereas in relation to carbon it is more like 50%. Yet we have a huge focus on carbon and a relative neglect of this issue.

The Chair: It is a big, big question.

Rob Cameron: Tony has offered important statistics on the extent of the issue. I would only add that it is very likely that the nation will not be able to meet its statutory or policy biodiversity targets unless it addresses the nitrogen pollution issue both on water and in the air.

Lord Trees: You would regard that as a major limiting factor then?

Rob Cameron: Yes.

Dr Tony Juniper: Yes. Very much so.

Lord Trees: It is a very complex area because we have different compounds containing nitrogen delivered in different media on land, in the air and in aqueous environments. If you had to choose the priority issues that could improve biodiversity, which parts of that complex jigsaw would you concentrate on?

Dr Tony Juniper: Our conclusion would be agriculture, considering the numbers linked to the amount of nitrogen coming from that sector compared with others. Something like 80% of airborne ammonia is coming from that route as is something like 60% of the nitrogen that is leaking into the water and getting into the land, so it is a big heading linked with agriculture.

Of course, that does not diminish the importance of other sources including those coming from wastewater and from air pollution linked with transport and fossil fuel combustion, so it is a wide set of issues. However, for our work, which includes the integrity of protected areas, our attention is often drawn to agriculture as being the principal source where we could take effective action hopefully over quite short time scales.

Having said that, the legal regime as it presently works—and I am sure we will get on to this—has drawn our attention to the built environment because of the way the legislation—this was said in the last session—draws attention to so-called plans or projects which are permitted or which require planning permission, which does not include quite a lot of agriculture.

Lord Trees: I noticed that. Rob, do you have anything else to add?

Rob Cameron: Ammonia is a particular issue; our specialists are particularly concerned about the effect of ammonia on our most special wildlife sites, the protected sites, and in relation to the current framework of targets, the established target for reduction of ammonia is only likely to reduce the extent of damage to SSSIs or to reduce the number of SSSIs over critical loads of nitrogen by 3% or 4%.

Lord Trees: Lastly, do you think mitigation technologies are available here and now, if we could implement them effectively?

Dr Tony Juniper: There are technological approaches that could help, including in relation to precision agriculture and the much more efficient application of nitrogen in fields, but there are more profound challenges. Rob remarked a moment ago about the limited extent to which we will see protected site recovery considering the trajectory that we are on, thereby inviting thinking about the systemic challenges linked with agriculture and the shift that we might wish to make towards more regenerative methods over time. We should be finding ways of incentivising and supporting that as a way of bringing down the need for

more nitrogen going into the system in the first place. Technology can help us, alongside broader base changes.

Lord Ashcombe: Thank you for coming this morning. You mentioned that, in comparison to yesteryear, nitrogen is in a much more advanced position than carbon. Do you think therefore that, to help mitigate pollution, the Government should consider transferring their firepower—of which there is quite a lot at the moment—from the carbon industry to the nitrogen industry?

Dr Tony Juniper: I would say it is both, rather than either/or. Obviously, the focus on carbon is now an urgent and pressing issue, given what we know about the impact of rising greenhouse gas concentrations in the atmosphere and the likely consequences of that in the coming decades. Nitrogen needs to have a higher importance, not to diminish the focus on carbon but to recognise that these two things are actually related to one another, including the manufacture of ammonium nitrate which uses nitrogen from the atmosphere as a feedstock to create inorganic fertiliser but which comes with a very hefty carbon footprint in the process. By reducing our reliance on imported or manufactured nitrogen, we would have a beneficial impact on CO₂ at the same time.

There are huge cost savings linked to this as well, in relation to the expense of producing ammonium nitrate fertiliser, a large amount of which is lost into the environment as a result of the inefficient ways in which we are using it. Rob reminded me of a really striking statistic: the value of the nitrogen that is being lost into the environment is equivalent to about half the profit earned by British farms. So, there is a huge cost saving opportunity here, as well as an environmental benefit and a carbon benefit if we can get our arms around the systemic approach that is warranted.

The Chair: That is a very striking figure. Can we have some information about where the evidence for that comes from? It would be really helpful if you could supply that in writing.

Lord Krebs: It may be that you would like to reply to my question in writing as well. In our background briefing, five different schemes are mentioned in the context of reducing nitrogen pollution: the Local Nature Recovery scheme, the Landscape Recovery scheme, the Countryside Stewardship scheme, the Nutrient Mitigation scheme and the Catchment Sensitive Farming scheme. When I asked Defra how all these fit together, I did not receive a satisfactory answer so I wonder, Tony, do you know how they fit together? Secondly, what is the evidence base that says they will actually deliver reductions in nitrogen pollution?

Dr Tony Juniper: The short answer is that these things run in parallel to one another. They speak historically to quite a piecemeal approach towards this issue, with different schemes being invented to deal with different problems as they have arisen.

If you look at the parallel approach that we take on climate change, we set an overall carbon budget; we take action in different sectors to reflect

the overall budget; and we logically invest our time and effort in the low hanging fruit, for example moving from coal into gas and into renewables, and paying less attention in the short term to aeroplanes because it is more complicated and there is not a technological pathway available yet. Whereas with nitrogen we are running several schemes at once without that overarching framework.

If we look at the systemic nature of this and the effect of nitrogen coming from multiple sources to cause ecological challenges, logically what we should do as a nation is to set a nutrient or nitrogen budget and implement changes that are the quickest, cheapest, most efficient ways of doing that in a much more structured and strategic manner. We do not have that framework at the moment.

The parallels with carbon—a systemic pollutant causing big changes—are quite apposite. At the moment, however, it is like having, in relation to carbon, energy efficient light bulbs, electric cars, something on recycling, and something on renewables, not connected to each other and not necessarily driving towards the big target. One big target to have in mind is the fact that the Global Biodiversity Framework Target 7, to which the British Government are a signatory, says that we should be reducing excess escapes of nutrients into the environment by 50% by 2030 compared with 2022 levels. It is fair to say we are not on track to do that.

Lord Krebs: Very helpful, thank you.

Q88 Earl of Leicester: How difficult would it be to set a nitrogen budget? Is it a lot of work? It sounds like an excellent idea but there are complicated issues with different nitrates or nitrogens.

Rob Cameron: I am sorry, but I do not know. It has been done in Scotland. In principle, it could be done in England.

Dr Tony Juniper: There is a lot of data being gathered. We have a lot of information about particular sources and, even if we are making some estimates to begin with, it would be a good starting point.

A lot of the work we do is about cascading that down to catchment level because quite a lot of the attention that we devote to this is about the integrity of protected sites: very sensitive wetlands like Poole Harbour, which was mentioned earlier, the Norfolk Broads, the Somerset Levels and the Solent are all significantly exceeding their nutrient loads. If you set a catchment level target, it might help us to get beyond this focus on nutrient neutrality and bring in other sectors which are also contributing to the problem.

The Chair: Just to try to get a handle on the depth of the issues that we are facing and how they are related to carbon and greenhouse gas and climate change, if we destroy our carbon sinks—which is what ecosystems are, whether they are marine or land—then we are really tying one hand behind our back when it comes to dealing with climate change.

In that context, how important is it that we address nitrogen, and maybe one or two other pollutants, in the same way and with the same methodology and processes as we do climate change through the Climate Change Act?

Dr Tony Juniper: Interactions between the carbon questions and the health of the natural environment are many and varied. I am not sure whether anyone has done a carbon assessment of the effect of pollution in damaging ecosystems and what the carbon contribution of that is or the diminishing of the sinks that hold carbon, but that would be a very interesting piece of work to do.

One that immediately comes to mind would be coastal seagrass beds, habitats that store a lot of carbon. These are already under extreme pressure and susceptible to coastal pollution, including that coming from nutrient pollution. There are linkages, but I do not think that anyone has yet worked out the quantity of those. It would very likely be significant.

Lord Duncan of Springbank: You mentioned that the UK is falling short in this area compared to the other signatories of the treaty that we are talking about. How would other like-sized economies across Europe compare? Are we particularly bad, or are we in the middle of the pack?

Dr Tony Juniper: Most countries with a large intensive agriculture sector like ours are highly challenged on this subject, but there is some leadership across the European Union. You can point to some countries that are taking a strategic and long-term approach. One is Denmark, where you see a 40% reduction in nitrogen emissions to the environment compared with the mid-1980s as a result of a regulatory approach which has taken that country to the point of a 4/10ths reduction. It is now flatlining and needs to go further, probably through other measures.

In the Netherlands—I do not know what its reduction is—there has been a very strong and determined effort led by the central government to reduce agricultural nitrogen pollution, not least in order to be able to free up built development. Obviously, that is a challenge which has been visible in this country as well. So, there are examples from different places.

Lord Duncan of Springbank: Are there any examples of comparable economies? I am aware that Denmark and the Netherlands are intensive farming areas but what about, say, Germany, Poland, France or Italy, where you have significant economies that have challenges across a wider base?

Dr Tony Juniper: I do not know of any decisive breakthroughs that have been made in those kinds of countries. Do you, Rob?

Rob Cameron: No. Our examples are not from those countries.

Lord Duncan of Springbank: That is helpful, thank you.

Rob Cameron: In terms of leadership, where you might look at Denmark or Holland in terms of how you would design a regulatory approach, we have focused very much on advice and incentives and who can say how far that will take us.

Q89 **Baroness Whitaker:** In your 2022-23 annual report, you say that you have sought to improve the integration of your work with others in Defra and so on. May I therefore ask how you work with Defra, local authorities and other agencies on land nitrogen and other nutrient management and how effective that is?

As I see it—correct me if I am wrong—Natural England is key to the efficacy of Defra and the Environment Agency in nature recovery and various other environmental objectives, so you have to be able to influence them and probably vice versa. How is it working?

Dr Tony Juniper: One of my priorities as chair over recent years has been to get a much stronger alignment between the work we are doing in Natural England, our sponsoring department Defra, and our sister agencies, especially the Environment Agency and Forestry Commission. It is fair to say that we have made pretty strong progress in getting this stronger tie-in between us. That is reflected in our strategy, which very much reflects the Environmental Improvement Plan, and in the work that we are doing on the ground with the Environment Agency. This is good in so far as the policy and the funding will take us but as we mentioned a moment ago, we have rather a piecemeal set of tools being deployed, and different agencies and different bits of government have different responsibilities. Ours is focused very much on protected areas compared with the Environment Agency, which focuses on broader environmental quality. But we do strive to link up our statutory functions and strategic plans to point very much in the same direction. As was said in the previous session from the local authorities, the key is partnership and getting multiple agencies working together. To that extent, local nature recovery strategies are going to be a really important vehicle.

We are now working with a new approach called Protected Site Strategies, which is a power we got from the Environment Act 2021 that enables us to look more at catchments in relation to protected areas. We also obviously have a lot of work going on with local authorities through the Nutrient Mitigation scheme. In the end, however, we depend very much on Defra's priorities in funding the work that we do. At the moment, there is no overall strategic piece that we are running that is linked to nutrients; it is more to do with particular sites and the implementation of farming schemes, including Catchment Sensitive Farming.

On that, Chair, you mentioned a moment ago the effectiveness of Catchment Sensitive Farming. Rob may have some more numbers but, at the moment, we are estimating that it has led to about a 4% reduction in nutrient pollution despite involving something like 20,000 farm businesses across the country at a cost of £15 million a year.

The Chair: We have a whole question coming up on Catchment Sensitive Farming.

Baroness Whitaker: It sounds as if there is a degree of rationalisation which would be helpful. How formalised are your relationships? Do you have regular meetings?

Dr Tony Juniper: What we have tried to do is to foster collaboration from the top to the bottom. I have regular meetings with my counterparts in the chairs of those other two agencies in the FC and EA. Our chief executives speak to each other regularly and we try to cascade down the co-operation to ground level so that our teams are working in co-operation in particular landscapes.

Baroness Whitaker: Does this join well with your new focus on economic growth?

Dr Tony Juniper: Yes. The broader priorities of government are strongly reflected in our new strategy, which we have entitled *Recovering Nature for Growth, Health and Security*. We are trying to build the contribution we can make through recovering a healthy natural environment into those big cross-cutting themes that the Government are pursuing.

Q90 **Lord Layard:** Could I ask you about the Corry report on regulatory activities under Defra? How do you think that will affect your relations with all the different bodies that Baroness Whitaker was asking about?

Dr Tony Juniper: Well, it should help; Rob may have more to add. The big step coming from the Corry review is that it enables us to take a more strategic view of these subjects, to get beyond individual regulatory decisions and start looking at the situation in entire catchments. That is what the Corry review has pointed us towards, which we very much welcome. It will also foster more co-operation between regulatory bodies through, for example, the idea of a lead regulator that would work with developers on a particular major infrastructure project, perhaps enabling them to be dealing with one arm's-length body rather than two or more.

This should help with streamlining and help us to focus our regulatory functions and our advice in a more efficient way to enable development to happen more quickly. Linked with a strategic approach, our ambition is to lead to better environmental outcomes as well as the more efficient discharging of permissions to get things built. For us, it is not either/or—do we do growth or do we do nature?—they are codependent. We cannot have long-term economic or social well-being without a healthy natural environment.

Rob Cameron: I would add to that, if I may. The important backdrop to the question about the effect of the Corry report is that the biggest development impacts of our time are all cumulative, diffuse, indirect impacts, such as nitrogen pollution, water pollution, air pollution, recreational disturbance and habitat fragmentation. Our approach in the decades up to now has been to advise very much on a case-by-case scale in dealing with these issues. However, we cannot deliver solutions to

these impacts at case or single-site scale; we need to work at a strategic level, and the raft of recommendations in the Corry report will help us to work at that more strategic level and to focus on key outcomes.

- Q91 **Lord Ashcombe:** Brilliant. I should have declared my interest as living in a national park, which is probably pertinent to this question. How effective are the existing regulations and assessments, for example, the habitat regulation assessments and the assessments of agricultural plans and projects, at delivering nutrient migration and habitat protection?

If I may, I will give you the second question straight away. How responsive are the public bodies—of which there seem to be an awful lot, which is therefore confusing to me—to the advice you provide in relation to nutrient management, and how are you ensuring that mitigation measures under the Nutrient Mitigation scheme are actually effective?

Dr Tony Juniper: We have touched a little on the habitat regulations and the extent to which they are effective already, but the challenge is in relation to what constitutes a plan or project. Our advice, which led to the nutrient mitigation scheme, was triggered by decisions taken through the planning system that would have added more nutrients to the wastewater load and caused further damage to protected sites. That was triggered via the habitats regulations and thereby led to action, which we hope will at least lead to the situation not getting worse. It is a tactical intervention; it is not a strategic solution for the long term, but it will comply with legislation in not adding to the pollution load in relation to those very sensitive areas.

Lord Ashcombe: Can you measure that?

Dr Tony Juniper: We have done the modelling advice given to local authorities, which was touched on a moment ago, and we are now doing some measuring of actual water bodies to check whether we are getting diminished nutrient benefits out of the interventions that are being made. We are looking at that, but you cannot measure an effect until you have done it, so we have had to model the impacts in order to take the action and then measure the action subsequently. I do not know whether we have any results yet, Rob; do we?

Rob Cameron: No.

Dr Tony Juniper: We do not have results yet, but that is something we are looking at to be able to check on that. The big issue is the fact that a plan or a project in the habitats regulations is linked to things that have had a passage through the planning system or which require a permit or a consent of some kind, which does not include most of the agricultural operations that are causing nutrients to be lost into the environment. So the habitats regulations are effective and vital in so far as they go, but they do not cover quite a lot of the problem.

On the habitats regulations and the extent to which we can get good environmental outcomes, again, one of the things that we have been asking for, which is now in progress, is the ability to take a more

strategic approach. We want to get beyond individual housing developments to look at development in a whole catchment, and think about strategic-scale interventions that can unlock more development at the same time as solving environmental problems. This is something that we are very pleased to see is now included in the Planning and Infrastructure Bill via the nature restoration fund, which will give us the ability to take that action. Again, it is not a total solution, considering the wide range of sources that are in play, but it will certainly be a step up and a step forward.

The responsiveness of public bodies has been pretty positive. Rob may have more to say on that one.

Rob Cameron: There is a demand for our advice, and a statutory duty on competent authorities to give us notice when they intend not to follow our advice; we very seldom receive that notice. In those cases where nitrogen has been most difficult as part of the nutrient neutrality, planning authorities have followed our advice.

Lord Ashcombe: To follow up on that, what do you consider success to be?

Dr Tony Juniper: In the confines of the legislation, success would be defined as the pollution loads in those protected areas not becoming worse. Our success in terms of what Natural England is trying to achieve lies in getting maximum value out of the interventions that are being made. We would like to harness the nutrient mitigation schemes, which include, for example, creation of wetlands on previously intensively managed agricultural land, to be not only a nutrient benefit but a flood risk reduction benefit, a carbon store for nature recovery in that catchment, and available for the public to enjoy as an open space. If we can crowd in those additional benefits behind the investments that are coming from nutrient mitigation, that would be a much better outcome for society than just spending the money on trying to reduce the nutrients alone.

We have some very good examples of this, including one in the catchment of Poole Harbour that we did in partnership with the Dorset Wildlife Trust last year, which was the purchase—using nutrient credits—of a place called Lyscombe Down. It is a fantastic area of chalk grassland which was not very intensively managed, and the farmer wanted to put it into a nature recovery scheme. The nutrient mitigation mechanism enabled that and it is now managed by the Dorset Wildlife Trust. It will be a fantastic place for biodiversity in years to come. There will be plans to declare it as a national nature reserve, thereby making it a public open space. Colleagues from the Environment Agency have said that this would probably lead to a flood risk reduction benefit in the downstream catchment.

That is a great example of how you can layer different benefits on top of these mechanisms, which is what we will strive to do with the nature restoration fund, which will come in via the routes that are regulated for

nutrients, for example, but on which we can put other layers of benefit. Success, for us, is the maximum number of positive outcomes that we can lever for society, rather than just going in through the very narrow nitrogen lens or phosphorus lens.

Q92 Lord Krebs: One of the questions that we are interested in is whether there are not enough regulations in relation to nitrogen, or whether the existing regulations are not being followed. In that context, we heard earlier on in evidence that the level of compliance by farmers with the farming rules for water, including soil testing and having a nutrient management plan, is surprisingly low. The Corry review found that only 28% of farmers fully understand the purpose of regulations that apply to their farms. My question to you in this context is whether the catchment sensitive farming scheme is effective in addressing this shortfall in both awareness and compliance.

Rob Cameron: The answer is that it has an effect and we know the limits of that effect. Tony has already given the figure that, in the catchments where we have used it over a number of years, it has reduced nitrogen pollution by 4% in water. Where it is targeted, we think that effect can go up to 15%, 16%, perhaps 20%, so it has an effect but it needs to be part of a broader strategy.

Your question was particularly about awareness in the agricultural industry. It needs to be matched with other measures, such as continuing professional development schemes, which are growing and would have a great effect in spreading the progress in technology.

Dr Tony Juniper: One other limitation of catchment sensitive farming that I have been made aware of is the extent to which some interventions can actually exacerbate pressures in certain catchments. For example, the provision of new slurry stores to take some of the excess manure can lead to more animals being added to the landscape, because you have more capability to be able to manage the waste, which puts more nutrients into that catchment. There is quite a lot of complexity and moving parts.

This draws my attention back again to the style of agriculture and what we might do to encourage a shift towards more regenerative farming methods, compared with where many farming businesses are today. There are many benefits for farmers in reducing input costs. There is a longer-term benefit for national food security in terms of looking after soils, and there are benefits for nature through the reduced release of nitrogen into the environment. That, of course, is quite a big step, but one that we should discuss, especially in the wake of the suspension of the sustainable farming incentive and whether regenerative agriculture might be something that could be put in its place. Many elements in it are already in that space but we might make that more strategic to deal with some fundamentals linked to the style of farming, rather than trying to deal with the worst impacts linked with it, which is what we have been doing now for 30 years and we really have not dented the problem yet.

Lord Krebs: Just to come back to Rob, 4% sounds pretty discouraging. Do we take from this that the answer to my question is that the catchment sensitive farming scheme is not very effective? A 4% reduction sounds pretty small.

Rob Cameron: You would have to look at that in terms of cost. We have looked at the cost and its effect, and it passes a cost-benefit analysis test. In terms of cost and scale of effect it looks worthwhile, but it needs to be part of a bigger strategy.

The Chair: I understand that you have 10 CSF advisers, is that right?

Dr Tony Juniper: It is many more than that, I think. I cannot remember but we can give you that information.

The Chair: Do you have enough advisers? Would it help you to scale up?

Dr Tony Juniper: Considering the scale of the challenge and the effect of the current investment, you could logically say that we would benefit from greater capacity and resources in that scheme. You could say pretty certainly that it is not going to be sufficient on its own, but it could be as part of a wider toolkit that involves regulation, advice and incentives, plus strategic targeting of ELMS, not only in terms of the style of agriculture but in some higher-tier schemes, including landscape recovery in particular catchments. You could see a whole range of the Government's different farming-related tools deployed together more effectively; catchment sensitive farming is one of them. We will provide you with more information on the investment going in, the cost-benefit analysis and the number of people and number of farms we are working with.

Lord Trees: Could I follow that up? We have heard that agriculture is key to much of the source of nitrogen pollution and it is a very complex area. The problem we have with agriculture is that it involves thousands of small to medium-sized enterprises. Who is responsible for and driving knowledge exchange and knowledge transfer to get awareness down to these thousands of small and medium-sized enterprises?

Dr Tony Juniper: We have a role through our farm advisers and via catchment sensitive farming. One limitation I would point to is our capacity for good stakeholder communications with farmers and the ability to share information across that very wide and diverse community. We are limited by the number of people and the channels we have for putting information out there. That is potentially something to look at in terms of how we inspire, engage and enthuse more farmers to come on the journey. It is something that can run in parallel to the incentives and funding streams that government has. As was said earlier, probably the most effective communicators in that space will be the farmers themselves in sharing good practice and being able to enthuse their neighbours to do positive things. We do not have a lot of capacity for that at the moment and our number of farm advisers has gone down.

Very briefly, when I go into the field and meet with the farming community, I am struck by the extent to which they value that face-to-face, one-to-one engagement with our advisers and the impact of that, compared with going on to a website with lots of technical, quite complicated information, acronyms and everything else. Investing in that relationship, where people meet other people and have relationships going over years, sometimes decades, leads to a lot of trust and to really good outcomes on the ground. We do not have enough of that.

Q93 Earl of Leicester: I can absolutely echo that because we have two very good Natural England farm advisers in north Norfolk. We work with them and trust them, and they trust us, which is excellent.

Moving on, how could current strategies and policies on nature recovery better take into consideration the impact of nitrogen pollution on biodiversity, both from air and in water? You have a slight advantage in that you were sitting in on the earlier session when a fairly similar question was asked of the council members.

Dr Tony Juniper: The core of the question is about strategy, is it?

Earl of Leicester: Yes.

Dr Tony Juniper: We touched on this a little already. Lots of tactical interventions are coming in different sectors, some related to air, some related to wastewater, some related to land and some to nitrogen application on farms. They all need drawing together and turning into a strategy that is more integrated and can help us to see the bigger picture. At the moment, probably the biggest challenge is that we have all these different places from which nitrogen is entering the environment, yet no real handle on where we are going to get the biggest impacts by making the most cost-effective and efficient interventions.

Earl of Leicester: We heard that in our first session.

Rob Cameron: Lord Krebs asked how a set of tools work together—LNRS, landscape recovery, the nutrient mitigation scheme. We need local strategies to knit those together, such as the protected site strategies that Tony mentioned. We have done modelling which explores the extent of impact that we can achieve through initiatives at different levels, and across the very large number of sites of special scientific interest that exceed critical loads. That modelling suggests that two-thirds would benefit from joined-up local action. The rest require national policy levers. We need to knit together the action at national and local level, and we need to knit together local actions.

Earl of Leicester: I suppose there are plenty of farmers who benefit from advice from Natural England, but equally there is a proportion—I do not know how large it is—who do not come to the party.

Dr Tony Juniper: Yes. In terms of the number of farmers involved in different schemes, about a third of the country is covered by Countryside Stewardship and landscape recovery. Two-thirds are not in those more

ambitious schemes but, of course, an awful lot are more involved in the sustainable farming incentive, as was, which is now subject to a standback by Defra. Perhaps this is an opportunity to think about ways in which we might use that more universal tier of the agricultural policy to encourage more of the kinds of behaviours that flow from this discussion.

Q94 Lord Rooker: To be honest, you have covered part of the question I was going to ask about how you might use the nature restoration fund. You have already given examples and, given the time, it does not seem worth going over them again, because they were quite positive. The supplementary was going to be about how often you advise for approaches that support the capture and recovery of nutrients as opposed to their removal. Is there a generalism you can give to that?

Dr Tony Juniper: Not a lot. The nutrient mitigation scheme is probably where we come closest to that emissions and removals kind of equation. One thing I would mention, which is potentially quite important to this discussion, is the extent to which we might think about circular economy technologies linked to wastewater as a potentially useful intervention. It has not only ecological benefits but carbon and food security benefits in being able to manufacture agricultural fertiliser out of dissolved nutrients in the wastewater stream.

There is a technology developed by a company called Ostara that produces a product called Crystal Green. It is an agricultural fertiliser manufactured from the nutrients in wastewater. There is one down the road here at Slough; Thames Water fitted one to a sewage treatment works there. I know that North America has this on a larger scale in Chicago. It is a good example of the application of circular economy thinking. The nutrients that are in the environment just reflect the expensive waste that is going on. We are paying for large quantities of fertiliser to be put on fields, at an expense to farmers; it is going into food, we are eating it, it is going into the sewage system and then being expelled into the environment and lost to us. If we can intercept those nutrients before they are lost to the environment, there are multiple wins to be gained. This is more for the EA and Ofwat, but again, if we had an overall strategy looking at nitrogen pollution, we might ask where the intervention points are, where we can not only stop it being emitted but catch it after it has gone into the system. That is one example of how you could do that.

This is not our area of regulatory competence or advisory remit, but it is something that I am aware has huge potential and there is some good academic work written about its cost effectiveness. Having built the plant, Thames Water will now have some experience of the investment cycle. It will be able to tell us about the payback time for the sale of the nutrients in the form of fertiliser and how that has compensated for its investment in the technology in the first place.

Lord Rooker: I know my memory is going, but I have the distinct impression that about four sessions ago we were invited by one of our witnesses to go to see that plant and see the company. They were here

because it was all part of that circular economy idea. We have not followed that up and we probably should.

My final bit really lodges on what you said just towards the end: it is not part of your remit, it is for somebody else. We have all been astonished at the numbers of organisations involved here. I just want to share with you one of the points that Glenys Stacey made to us about the issue of co-ordination. She said, "I am thinking here about how local authorities would need to join up with, for example, Natural England, the Environment Agency and others in a meaningful way. There are some good examples ... and it really has to happen now if the Government's Planning and Infrastructure Bill is enacted, as we expect, and Natural England takes a central role". The argument is that you should take the dominant role, the leading role, or are you just going to be sharing aspects of it with others? It is probably not down to you, but somebody somewhere needs to make some changes so that farmers, producers and others are aware of who is responsible for what. There just seems to be too many different organisations.

Dr Tony Juniper: Yes, fragmentation across multiple actors is a huge challenge, hence our mission at Natural England is about building partnerships for nature's recovery. We recognise that there is no way we are going to be able to make a dent in these huge issues without joining together different elements of society, whether they be local government official agencies, government departments, the private sector, land managers, or NGOs; they all have to be pointing in the same direction. That requires enormous effort and co-ordination. Fortunately, we now have a few more tools to help us do this: elements of the Corry review, local nature recovery strategies and the ambition of organisations to work together are all helpful.

However, if we are going to get beyond our tactical toolkit, which includes lots of different things, some quite good, and into a stronger position to deal with these big, cross-cutting issues, we need an overarching strategy. That naturally comes from government and possibly several government departments at once, considering the broad-ranging nature of this. There is an opportunity for some progress by using the resources that we have more effectively, rather than necessarily thinking about more resources. The other thing about this integration point that is really important at the moment, as we are heading into a tight spending review for the coming years, is how we are going to get more out of the public investments that are already going in by joining them up, co-ordinating them, and getting multiple outcomes in particular places through better co-ordination.

The Chair: Thank you. We are fairly comprehensively out of time but the central tenet of Lord Rooker's question was: when are we going to get a body where the buck stops?

Lord Rooker: When we get a Government who lead.

The Chair: There are too many parallel lines, even with a strategic

oversight body to bring them all to one point, but somebody somewhere has to take responsibility for the dreadful decline in nature. We are one of the most nature-depleted countries in the world and we are not getting any better.

Dr Tony Juniper: No, and we at Natural England are determined to do whatever we can to help. I finish with an invitation for the committee: if you would like to have a look on the ground at some work going on in relation to the nutrient mitigation scheme, there are quite a few places where we would be delighted to show you how this works at ground level in terms of land use change linked to nutrients and to housing development, and to give you some insights into the practicalities of that. The one I mentioned, Lyscombe Down in Dorset, might be a good one where you can see multiple benefits coming from the investment from the nutrient scheme.

The Chair: Indeed, but when do we see results? You mentioned housebuilding, et cetera. We are still seeing dreadful decline in the natural environment in the UK and we are not seeing any housebuilding either.

Dr Tony Juniper: That one led to 3,000 houses being unlocked and planning consents given, as a result of a step that took land from agriculture and into nature recovery. We can show you that.

The Chair: Do you think the situation as it stands is good enough?

Dr Tony Juniper: Certainly not, no. The natural environment in this country is still on a trajectory of decline. The OEP will give you a summary of how we are doing in relation to our environmental improvement plan.

The Chair: We know that. How do we get out of this downward spiral?

Dr Tony Juniper: A more integrated, joined-up, strategic approach is the short answer. We have covered today what that might look like in relation to nitrogen, but it applies in other areas—in built development more generally and land use planning. The land use framework, which we have not touched on, is an opportunity to do more of that and think beyond the individual parcels of land and more at landscape level. We have some powerful new tools: the protected site strategies are very good. One I would mention is the landscape recovery tier of ELMS, which can make a huge impact on this. We hope the Government will remain firm and strong, and not only keep that but expand it.

The Chair: Tony Juniper and Rob Cameron, thank you very much. Tony, we absolutely appreciate your passion in trying to get the right outcomes for nature. We—or certainly I—nevertheless remain worried that we just do not have the structure or the strategy in place yet to do that.

Dr Tony Juniper: We are worried too.

The Chair: Thank you very much for taking the time to be with us today.