| **INT:** | **So, it should just ask for your confirmation.** |
| --- | --- |
| DEU27: | Yes, it’s okay. |
| **INT:** | **Brilliant, so we’ll just start off with maybe if you can tell me a bit more about your background? So, the name of the organisation that you work for or are affiliated with and then your role within that?** |
| DEU27: | Okay, yes. I’m a Senior Invertebrate specialist with [environment organisation]. I’ve been doing that role for over ten years now. Before that I was a coastal specialist but that’s quite a while ago. So yes, my present role is-- it’s a national role, so, it’s working with partner organisations managing projects sort of nationwide to do with invertebrate conservation. And that involves a whole variety of things all of which use data to some extent and some of them produce the data as well. |
| **INT:** | Brilliant and so do you collaborate with a lot of partners then? And is this, presumably on a national scale? |
| DEU27: | Yes, it’s on a national scale, this is a national role. Yes, with a lot of partners, everything from some of the more obvious ones, that’s like Buglife, [wildlife charity], Bumblebee Conservation Trust but also the RSPB and some of the water companies who own and manage land and are interested in conservation. |
| **INT:** | **No, absolutely, brilliant. In terms of purpose for using species record data, do you focus on single species or groups of species?** |
| DEU27: | Both. Single species are important where you’ve got a rare or threatened species and a lot of our projects involve monitoring these very rare species annually. So, you can determine how well they’re doing and you’re also in many cases relating that to the habitat. So, often if a species has declined in a couple of years and you can see the habitat’s declined, then you can step in and do something about it. So, that’s sort of single species.  Multiple species would be more where you’ve got perhaps an assemblage of invertebrate species associated with a particular habitat and it’s gathering data to help determine whether that habitat’s in good condition. So, for example you’ve got perhaps a big group of invertebrates associated with short-sward chalk grassland, and through getting a lot of data, i.e, a lot of people going out recording what they’ve seen, putting it into this database we’ve got which is called Pantheon, which then relates those species to a particular habitat type, quite detailed. Once you’ve built up that data you can then use that as your baseline and then people go out and record on these habitats and the more species you record that are in the database already the better you can infer that the habitat is-- cause it’s supporting more species. That’s one example of sort of multiple species data use, and both data use and data run. |
| **INT:** | **Yes, no that’s brilliant, and I think you just alluded to it there but does that inform any decisions at all?** |
| DEU27: | Yes, it’s geared towards, it’s mostly geared towards habitat for the invertebrates and also wider habitat. The more data you’ve got on numbers and whether they’re declining or increasing, the more you can learn about the habitat they need. As I said before, in particular if a species is declining, you’ve got the data to show that and you’ve got corresponding data to show that the habitat isn’t quite right, you know you can step in and do something about it. But if you’ve got someone who isn’t sure about the habitat but you’ve got a declining species, then the first thing you should do is to check the habitat and see if that might be the cause, then you can do something about it, so. |
| **INT:** | **Have you got-- just an example of like a strategy that you would then implement to mitigate that challenge?** |
| DEU27: | Yes, I can use one example if you like. |
| **INT:** | **Yes, that would be great.** |
| DEU27: | This is a thing called the wart-biter bush-cricket, which is a very rare insect, only found on five sites in the country now. There was one site which we may have, we’re on the verge of loosing now. What happened was it was being monitored every year but it requires a certain grazing regime to produce the right grassland. We noticed that the farmer hadn’t grazed it in the right way for a couple of year so we, and the monitoring had declined, so in the second year of that we made a specific search for it and didn’t find any. So, we had a word with the farmer, found out the reasons why the grazing regime had gone slightly wrong, got it corrected and last year we did manage to find a few. So, it’s touch-and-go still. But that’s a sort of specific example of how you can, or how the habitat can cause a species to decline. It works both ways, in this case we actually noticed the habitat had deteriorated in condition, and that prompted us to carry out a more detailed search for the insect than we would have done otherwise.  But in other instances, I’m trying to think of one where it works the other way round. Of course, I can’t think of any examples off hat. |
| **INT:** | **No that’s brilliant, no it’s just interesting to hear an example. That’s great.**  **So, in terms of obtaining your data, where do you get this from?** |
| DEU27: | There’s a variety of sources. I’ll just give you a few examples. There’s-- for moths, there’s the Rothamsted data set, which is a constant trapping survey, and that’s where the Rothamsted Institute run a series of moth trapping, moth light-traps around the country and they’re run every night. Most of them have been running for 40 years now, so it’s a really constant effort survey. Gives us very reliable data on population changes and we’re now in a position where we can use that long data set to really get a good idea of how, which moths are declining, which ones are increasing, whether it’s associated with particular habitat types. So, I think that’s one of the longest running insect data sets, possibly anywhere in the world actually. |
| **INT:** | **Does that require someone to monitor-- stay with it at all or is it just--** |
| DEU27: | No, you put the light trap out, you can leave it overnight and you come back in the morning and count the moths that are in it. |
| **INT:** | **Okay, so it still requires someone to go ever--** |
| DEU27: | It still requires someone to be there, which is why sometimes the, you know it’s not every trap is run for 40 years, sometimes someone leaves or something happens and you can’t use it. But there’s been enough traps running over that time period that it gives us really good data. But yes, it does require-- it doesn’t have to be the same person, just requires someone to be in a position to monitor that trap every night.  Other examples are the UK Butterfly Monitoring Scheme which has been also running for, I can’t remember the exact amount of time but it’s 20 plus years, and that’s where someone walks a set transect counting every butterfly they see, every butterfly, every species. And again, by doing that in a standardised way, that’s now giving us and [wildlife charity] very good long-term data on butterfly numbers. And we’re now also using that. In fact, we’re using that at the moment to update the butterfly red list of threatened species. That’s in progress at the moment using, not just that data, but that forms quite a large part of the data that will be used to assess which species are threatened. |
| **[00:10:00]** |  |
| DEU27: | In a similar way, the Bumblebee Conservation Trust have recently set up what they call Bee Walks, which is exactly the same principle, it’s people walking a set transect once a month and counting every bee of every species, as far as they can. That hasn’t been running as long, it’s not quite as good as the butterfly one because bees are a lot more difficult to identify, especially when they’re just buzzing past. But there are enough set up now that we’re getting enough data to start to see some trends. But we haven’t yet got enough data to use in the same way we’re using butterflies and moths. But it’s the same principle. It only started relatively recently, within the last ten years, I think.  So, that’s three national ones. We also, we’ve developed various techniques, standardised techniques for monitoring insects and invertebrates on our SSSIs as part of the condition assessment. |
| **INT:** | **That’s brilliant and do you find, this might seem like a silly question but do you find that there’s a bias towards data sets for certain species than others?** |
| DEU27: | Yes, definitely, yes. Of course, it won’t be a surprise to learn that it tends to be the big, pretty, easy to identify species that we’ve got the most data for. Butterflies, moths, dragonflies and now some bumblebees we’re getting lots of good data on because lots of people are interested in them, they’re easy to identify. And if you get down to things like certain types of flies and obscure bugs, which are very difficult to find and identify, so it takes a real specialist to go and do that, you know there are specialists who’ll do that and we have got some data on virtually all invertebrate groups. But some of it’s pretty limited, because there might only be a handful of people in the country who have the time and specialist skills to go out and find and record these, caddisflies or obscure bugs or whatever. |
| **INT:** | **Sure, and how do you address the species that aren’t recorded as much in your work?** |
| DEU27: | There is a limit to what we can do. To a certain extent you can use models to predict trends, that’s where, you know you can use that where you haven’t got sufficient numbers to make the, to see an obvious trend. You can model it but obviously the less data you’ve got the less reliable the models going to be. So, we do what we can. But where there’s very limited data, we really can’t do a lot in terms of monitoring population or even distribution. You know you might get a-- say an obscure group of spiders with a real concentration in say East Anglia, and virtually on records from anywhere else. You might think, oh, this is restricted to this habitat but of course it could be that there’s two recorders there who are monitoring close to their home and virtually no one anywhere else. So, you do get biased like that when you get down to just a few people who call it in. |
| **INT:** | **No, that’s brilliant, and in terms of the format that the data comes to you in, is that as raw data or has it been processed in any way?** |
| DEU27: | I should say that most of the data doesn’t come to me in particular but when it comes to [wildlife charity] and you know the partners I work with, it comes in as raw data. And I do commission surveys myself and that comes in as raw data and then it takes sort of specialists to model it and work up the population trends and that. In fact, the Centre for Ecology and Hydrology have got a lot of specialists and they do quite a lot of modelling, both for us and for the NGOs. |
| **INT:** | **Okay, no that’s brilliant. So, presumably you don’t do any processing or analysis of the data yourself then, you look to those to--** |
| DEU27: | No, I’m a field ecologist I’m afraid, not a-- |
| **INT:** | **No, that’s brilliant. And does the resolution differ depending on the circumstance?** |
| DEU27: | What do you mean by that exactly? |
| **INT:** | **Sort of the scale in which the data is collected.** |
| DEU27: | Yes, I think as I sort of mentioned before if you’ve got a good data set from a good spread over the country, you’re going to get a much more reliable indication of, in this case a species distribution than if you’ve got a concentrated effort in certain parts of the country, which might skew things and give you a false impression of its distribution. So, is that kind of what you were getting at? |
| **INT:** | **No, that’s brilliant, no that’s great. And what information do you use to inform your interpretation of the data? So, how would you consider confidence, accuracy and precision? That sort of relates to the resolution question I guess.** |
| DEU27: | Well obviously, the more data you’ve got from the more places the better, the more reliable. After that it comes down to the use of the modelling I suppose. And that sort of details really a question for a statistician, I can’t really answer that. But I do know that, yes, the modelling does rely on good data from a wide area. The more data the more reliable the model. |
| **INT:** | **Yes, no, brilliant. Great-- and do you share your sort of results in terms of reports and projects?** |
| DEU27: | Yes, in terms of our-- again, I work in collaboration mainly, so it’s not necessarily that I’ll produce a report but I manage several projects or help, I’m involved in several projects nationwide that uses that data.  Just to give you some examples, we’re in the process of producing our red lists of threatened species. So, for as many groups of invertebrates as we can we’re using this data and getting statisticians to model the data to produce both population trends and changes in distribution, we’re using that to assess which species are threatened. And that’s based on standardised IUCN criteria. So, we use them to produce red lists of threatened species, and related to that, just one example is [wildlife charity] have recently produced a new version of what they call the State of Britain’s moths where they use that Rothamsted Data survey I was talking about, plus other data that they’ve got themselves, to independently make an assessment of which moths are declining, increasing or increasing in range. And that’s, I think they aim to update that, I can’t remember if it’s every five years or every ten years. But again, as I said with moths, there’s good enough data that you can sort of update something like that ever, regularly. And that also gives you a good independent idea of what’s happening around moths. |
| **INT:** | **No, that’s brilliant and how could the-- I think we’ve sort of alluded to this already but how could the data you use be improved to help in your decision making?** |
| DEU27: | Yes, we have alluded to it, and sort of-- |
| **INT:** | **More data** |
| DEU27: | And in particular trying to encourage people to focus on the less well-known groups. So, you can get, more and more people are getting interested in, I think in nature and in recording and invertebrates and if their sufficiently interested we might suggest that they focus on perhaps a particular group of bees or beetles that aren’t so well known. There’s a surprising number of people who will be interested in that and start to give us data on these less well-known groups. |
| **INT:** | **Yes absolutely. How can you encourage that engagement?** |
| **[00:20:00]** |  |
| DEU27: | Let’s see, not word of mouth exactly but there are various sort of insect forums, as well as [wildlife charity], Buglife are quite a big charity and Buglife, I think deliberately try and focus on those less well-known groups. Because you know you’ve got the British Dragonfly Society monitoring dragonflies, [wildlife charity] monitoring butterflies and moths and then you’ve got the Bumblebee Conservation Trust. And you have got you know the British Arachnid Society which are to do with spiders, and various small organisations like that. And Buglife I think try and have an overview of those lesser well-known groups. |
| **INT:** | **Yes, no that’s great, brilliant. So just to sort of the final bit, I’m just going to focus a bit more on model data. So, how would you feel about using model data for your work?** |
| DEU27: | We rely on it a lot. Obviously, there are, again I don’t know the details but there are certain models which are considered to be more reliable than others, just for example there’s a thing called the Alpha-Home model which we think is quite reliable in producing or giving us trends in distribution. And that, again the more data you’ve got the more reliable that model is. But you can use it if it’s-- again, I’m not a statistician but I think if you’ve got a sort of-- say a hot spot of records but a few records from other places, I think that, you can use a model to assess distribution. But again, we very much work in partnership with people who know the models and sometimes develop models for a particular purpose. Sorry, I’m really not a modelling expert. |
| **INT:** | **No, not at all, no.** |
| DEU27: | I mean, we do rely on models quite a lot but, we do rely on models an awful lot, you know rather than sort of raw data, you can gauge, you can do a certain amount, even with the moth data you can do a certain amount with raw data, but you still model it to produce accurate trends for distribution of population. |
| **INT:** | **I guess modelled data in that sense is more informative then to you?** |
| DEU27: | Yes, ultimately yes in terms of applying it to conservation, yes, it’s more important than the raw data. The raw data is like the ingredients and the modelling is the sort of end product, the food at the end of it all or whatever. |
| **INT:** | **The cake, yes.** |
| DEU27: | That’s a rather silly analogy, but still-- |
| **INT:** | **No, it’s good, that’s brilliant. So, I’m just going to show you some examples of model data outputs that have been created by part of the side project Team. So, I’ll just ask, I think-- I’ll just ask if you can interpret them and then whether you find them useful. And then anything that you would add or remove to make them more user-friendly. So, I’ll just share my screen now. So, hopefully that should come up there.** |
| DEU27: | Yes, it has, yes. |
| **INT:** | **Brilliant. So, we’ll just concentrate on the one on the left and this is for a five-spot burnet moth. So, the one on the left is a raw probability distribution model, are you able to interpret that one at all?** |
| DEU27: | In terms of sort of how I’d use it to assess-- |
| **INT:** | **Yes, how would you use that model, yes?** |
| DEU27: | Okay, I would use it to get an idea of the distribution where the moth’s concentrated. So, in this instance it’s sort of very much focused on West Wales and the South West of England. Doesn’t tell me an awful lot about the habitat it uses but it does tell me that it perhaps either prefers or has adapted to a slightly damper cooler climate than the very dry parts, say in East Anglia. So-- |
| **INT:** | **I guess that would be an assumption, wouldn’t it?** |
| DEU27: | It’s an assumption, I can’t-- I can see that there, if I was to focus, if this was a rare moth and it’s not particularly rare but if it was a rare moth, it would allow me to sort of home in on areas to concentrate conservation efforts. You know just for example, it isn’t-- but if a model similar to this showed a hot spot on Exmoor say, I could say, “Right, okay, we’ve got partners in [Place], let’s go and do some research on this, find out exactly what habitat it’s using, find out if the habitat’s changing.” That’s one way I could use a model like this.  In this particular instance all I could really say is that it’s, yes, I can see where it’s focused on, where’s it’s distribution. And you can see, I think also how it, the number, the population decreases the further north and east you go. So, it’s not just that there’s-- I’m not just focusing on the green, you can see the amber and the darker and pale pink. So, you can really see that the further South West, you go and South West Wales, the population gradually increases.  And then yes, I would make inferences about habitat and climate it’s using. But those inferences are educated guesses. I could use those if I wanted to to go and do research in particular areas to, you know test the hypothesis if you like. |
| **INT:** | **Yes, absolutely, no, that’s brilliant. So, just sticking with the raw probability distribution, I’m just going to scroll down now. So, this again on the left is a raw probability distribution model but around a 5 km point in Wallingford in Oxfordshire.** |
| DEU27: | Oh, yes. |
| **INT:** | **So, this is sort of just focusing in more at sort of the local scale, again would you be able to interpret this and would you find it useful?** |
| DEU27: | Yes, I can interpret in, it’s a very, a similar way. What-- it’s a finer scale, but there’s an obvious concentration of the moth in the, what can I call it, the south-eastern corner if you want to put it that way. And there’s obvious gaps where it’s almost absent. In terms of using is, this is 5 km, in this instance it might be useful to relate it to habitat, so if you could overlay a habitat map and if you could see that, the areas where it’s absent are either perhaps built up areas or sort of where they’ve got housing developments or whatever. And perhaps the areas where its highest concentration are good quality grasslands. So, if there was a map I could overlay then I’d use that to sort of relate it to habitat. And if there wasn’t then I could do a survey, survey the area to find out, you know what particularly habitat in areas the moth was in and why. |
| **INT:** | **Yes, no, that’s brilliant. I’ll just move on to the one on the right now. So, this is a variation model, again for the five-spot burnet moth. Are you able to interpret this one?** |
| DEU27: | A variation model. You might have to explain a bit more about what a variation model is actually. |
| **INT:** | **Yes, of course, yes, so, this sort of works in-sync with the raw probability distribution model in the sense that it’s showing you the level of confidence you have in the species distribution. So, for example in Wales, where you’ve got areas on the raw probability distribution model of the high likeliness of that species being there, the variation model, the darker the colour the less confidence you have because there’s a greater variation in that species being there.** |
| **[00:30:00]** |  |
| DEU27: | Okay, gotcha yes, okay so the way I’d interpret that would be, again if it, I assume if it was a rare species or species, I was interested in I would focus on the darker areas and say, “Okay I’m-- are there-- is the reason for the variation that there are fewer records there in that area?” And if so, if it’s likely to be an important area for the species then I could focus some recording effort there to try and get a better idea of its distribution, whether it really was absent from there or whether it was just due to under-recording. |
| **INT:** | **Yes, absolutely. So, it’s almost, filling in the gaps?** |
| DEU27: | Yes, yes if you like, filling in the gaps, but again using my knowledge of where, or where important areas or habitats are, you know perhaps in an area I’m particularly interested in to, yes to home in on that. Sorry, someone’s knocking at the door but I’ll ignore it but the dog will bark. Yes, does that? |
| **INT:** | **Yes brilliant, and then I’ll just quickly the one on the right is again a variation model for the model on the left.** |
| DEU27: | Okay, so the higher, the darker green the less confident you are, is that right? |
| **INT:** | **Yes, it is a bit confusing with the other model. Yes, the darker the less sort of confident you are.** |
| DEU27: | Okay, well in this instance, it’s quite interesting that where there appears to be the highest concentration you’ve also got the least confidence in your data. So, I would, again if this was a species I was interested in I really would home in on that effort and try and get more recorder data from that area to try and improve the situation. |
| **INT:** | **Yes, of course. Other than-- you mentioned about habitat sort of layers and habitat maps. Is there anything else you would add to these to make them more useful.** |
| DEU27: | Let’s see. Sorry, the dog’s barking.  It would be-- I suppose, going back to recorder effort, that would be another one. If it was a less well-known group I would use that to say, “Okay, as well as habitat is there a particular focus of--” Perhaps in this, such a small area but as a whole is it due to recorder effort? But even in somewhere like this, you know is that, is an apparent hotspot, because for example if it’s a butterfly there might be a butterfly transect for that area, so you get more records. So, there’s things like that as well as the obvious habitat ones. |
| **INT:** | **Yes, no that’s brilliant, no, thank you for that. Was there anything else you wanted to discuss about these?** |
| DEU27: | I suppose things like this, you could use them to infer perhaps, not speculation but-- see how climate change might be effecting species. I know that as the climate warms some species are colonising Britain and moving north. And others are retreating to the North West because they’re more adapted to a cooler and wetter climate. So again that, using this, the map on the left I might think, Okay that’s my baseline, I’m suspecting that because it’s in these areas that are wetter and cooler it’s adapted to that. Let’s get more data. So, perhaps a long-term monitoring trend to find out if it gradually retreats further into those areas as time goes on, which might then give a better indication of change that may be due to climate change. |
| **INT:** | **Yes, no that’s a great point.** |
| DEU27: | So, that’s another, that’s the other thing that I’m potentially interested in because, you know as a conservationist declines due to man-made, or man-- human induced declines if you like are something which potentially we can do a lot about. I think it’s worth focusing effort on.  Declines of distribution that are due to climate change requires a bit more thought. Sometimes you may decide that there’s really nothing you can do, or not much you can do about it and it’s not, there’s no point in dedicating a lot of effort to try and save it or keep it in that area, because it’s obviously-- it doesn’t want to be there. So, it’s-- so yes, as a conservationist that’s sort of-- things-- |
| **INT:** | **Yes, climate change is obviously a hot topic.** |
| DEU27: | Yes, climate change, habitat change and also things like increased pollution. |
| **INT:** | **And certainly, to know more about the species associated with you know the effects of climate change, that would probably, looking forward that would be even more important in terms of your decision making.** |
| DEU27: | Yes, it’s going to be very important actually and again on the other, the circly one you had, the sort of finer scale, you could start to think, in terms of habitat it’s not just habitat loss but has there been habitat degradation? Has there been a change in perhaps the grazing regime even which is affecting the sort of sward height which may affect a particular species? So, larger scale models like this, you could use to sort of try and assess those, sort of almost like micro-habitat changes. |
| **INT:** | **Yes, no, absolutely, that’s brilliant. So, I’ll stop sharing my screen now unless there was anything else you wanted to add.** |
| DEU27: | No, that’s great, that’s been really interesting actually. |
| **INT:** | **Brilliant. So, I’ll just un-share now. Well, that’s been great. I’ve asked all the questions that I intended to ask. Was there anything else that you wanted to ask me, or you thought I should have asked you?** |
| DEU27: | I don’t think there’s anything else you should have asked me. I can’t think of any. Just tell me in a couple of sentences, tell me a little bit more about the side project and what you’re doing here. |
| **INT:** | **Yes, of course, absolutely. So, it’s-- the side project is made up of various partners. So, we’ve got people like myself from the Stockholm Environment Institute at the University of York. And then there’s CEH, Open University, along with local Record Centres and Butterfly Conservation. So, together we’re creating improved model data outputs in the form of an App and various tools, which is one side of the side-team.**  **And then there’s-- sort of the Stockholm Environment Institute and University of York that’s looking at understanding sort of current data needs from a recorder perspective and a data user perspective. And then trying to feed that into the making of the tool.** |
| DEU27: | Okay, yes so, you’re working with sort of Butterfly Conservation, CEH, quite a lot already. So, hopefully what I’ve said sort of corresponds to sort of what you’ve been working with. |
| **INT:** | **No, it’s been very interesting. And its always interesting people’s current uses and where they see the future of sort of data use going.** |
| DEU27: | Yes, again, I’m sort of biased as a conservationist but as I said it’s sort of habitat changes, both large and small-scale, and climate change are things that I’m focused on in terms of sort of deciding where to focus conservation effort and which species. |
| **INT:** | **Yes, no, well that’s been brilliant. Was there anything else that you wanted to ask me at all?** |
| DEU27: | I don’t think so, no. I’m-- apologies again for being a bit late, it’s my last day before two weeks leave and so-- |
| **INT:** | **Hectic one.** |
| DEU27: | Yes but it’s been really interesting, no, thanks. |
| **INT:** | **Brilliant. Just to sort of-- as my final question to you, the next stage of this is going to be looking at working with people like yourself to sort of give an input on their perspectives on the next stage. Would this be something that you would be interested in at all?** |
| **[00:40:00]** |  |
| DEU27: | Yes, definitely, yes, yes. I mean, on the obvious assumption it’s not going to take too much time. |
| **INT:** | **No, of course, no.** |
| DEU27: | But no, it’s-- I’m quite interested in this, it’s been useful. So yes, do keep in touch with me on it. |
| **INT:** | **That’s brilliant, that’s great to hear. Well thank you again, John, for your time and enjoy your two weeks off.** |
| DEU27: | Thanks, I will when I get there but no, it’s been great to talk to you, [INT], so-- |
| **INT:** | **Brilliant, thank you very much.** |
| DEU27: | Okay. Bye. See you |
| **INT:** | Take care. Bye. |

**Audio Ends: [00:40:28.0]**