INT: It should just ask for your consent from your side.

DEU35: yeah yes.

INT: So just to start off with maybe if you give me a bit of your background, so the organization that you're affiliated to, and then the role within that.

DEU35: Okay, I need to ask. You contacted me I think regarding my role at [wildlife conservation].

INT: Yes, are you still involved in that.

DEU35: I certainly am yes. I’m the county recorder for orthoptera for the [wildlife conservation organisation]. The reason I asked is, my day job is for the [wildlife conservation organisation]so relevant for both parties but I’ll put my [nature society] hat on for the purposes of the questions.

INT: That would be brilliant yeah Thank you.

DEU35: As I say, I'm the recording It means that county records for species belong to that group gets sent to me and I also look on I record to verify sightings by participating in the group called the [wildlife conservation], where we go out and a group of entomologists get together go to visit sites and do surveys.

INT: And you collect that data yourself.

DEU35: Relating to the orthopterans yes and I also will have done the collation of the lists for the whole group as well.

DEU35: We take that in turns.

INT: Maybe just maybe just a little bit about your day to day job, then as well.

DEU35: I'm nature reserve manager for [place] wildlife trust. We've got just over 14 nature reserves in [city] and [County] and I manage the team that is responsible for the practical day to day management of those sites.

INT: And would you say these roles are different in terms of say so, operational, and strategic planning.

DEU35: Very.

DEU35: Very different the sort of county recorder role is a very informal. Whilst there is a sort of job description that goes with it. Some of my county recorder colleagues don't seem to pay too much attention to what it is that they are supposed to be doing so it's you know we're volunteers, that the volunteer for a voluntary organization and the purpose of that voluntary organization is to collect data relating to their natural history of the county.

INT: That sort of moves on nicely and my next question, which is about. What species record data do you use and that's including single species and groups of species.

DEU35: So, in terms of my [nature society] role. I use records relating to the group of insects that I record for so that tends to be not very many records because it's not a group that attract masses of public attention. I mean, every year, you get stories about pink grasshoppers so we get queries about that sort of thing but generally most people don't take any notice of grasshoppers they're not pollinators particularly so you know, unless you have some purpose these days. It seems organisms that are sort of defined by how they look and how they're useful.

INT: that's great and I mean you talk about how grasshoppers perhaps are not the most interesting in terms of their role, but does the data that you collect does that inform any decisions at all on that side.

DEU35: I make the data available to the national recording scheme, but I also make it available to the local record Center because the local record Center has an integral role in checking when providing data to inform local planning decisions I’m a bit down on my group slightly which I shouldn't be really. There are some species in the county that are not of national importance but there are three species that have only three sites for two of them, and one site for the other so those sites are important in a county context nationally no one is likely to care too much if [city] sure loses one of his to mottled grasshopper sites, but in terms of the county by diversity, one of those sites was to disappear under tarmac and it would be not so good.

INT: And do you have a close relationship with the local record Center then.

DEU35: Yes, I’m a former manager of it. So, I used to work very closely with the current head of the record Center.

INT: And it's just one in particular or a combination.

DEU35: How do you mean.

INT: Is it just one records until it yeah.

DEU35: I’m county recorder for [city] sure so yeah, we just I just deal with the [city] environment record centre. The organization I work for [city] and [wildlife conservation] our area is covered by both the [city] environment record Center also the GiGL in London.

INT: that's good. Do you obtain your data from anywhere else other than collecting yourself and presumably through volunteers?

DEU35: Volunteers. Occasionally we get if there's some consultants work going on, and they're one of the more progressive ones, then they will share data but yeah quite often there's lots of development going on in the county the biodiversity reports that relate to those tend to be a bit of a closed shop. It's only a few consultants that will think that there might be data in there that's worth sharing I mean there is the client confidentiality side of things which consultants will push all the time, in an ideal world. That so that to me needs sorting out there either needs to be a presumption that the data will be made publicly available either after it straight after it's collected or perhaps as soon as a planning application is submitted. But at the moment that my understanding is that it depends on the policies of the local authorities, as to whether you know reports that are published in relation to a planning application can be used for another purpose other than determining that planning application.

INT: Good. And is there a particular resolution of data that you require.

DEU35: Well, I collect at the highest possible resolution I can because I’m an ex record member of staff and I mean to me species data is all very well, but it needs to be related to science and habitats, to make it really useful. Okay, so I have a particular bee in my bonnet about some of the national systems for delivering data and how poor they are at dealing with the site and habitat-based side of things so.

When I’m out recording I will I use the GPS and my phone so okay it's not hugely accurate, but I’ll collect an eight-figure grid reference, so it will describe the 10-meter square. When I’m back I check that that 10-meter square relates to where I was, and I will then attempt to relate it to a known site boundary.

INT: When you talk about the need for sort of habitat data as well alongside, is that the contextual information that's key to species data.

DEU35: I think so yeah.

INT: Is that to inform both a recorder effort and user as well.

DEU35: Absolutely, you know the habitat. To go back to the mottled grasshopper that I was talking about earlier, they have specific habitat requirements, so, if I can get access to data that describes that habitat in the county then I’ve got the potential of identifying sites where this species might be present, it might make my searches easier if I can get access to that, but also in terms of as an end user of data, trying to help inform the planning system, if you like, if I can link my species to that habitat and other people can make their species to also to that habitat, then you get a much better description of the net worth of that habitat my view is that the methods that have been used to assess biodiversity are far too botanically based and simplistic to cover. The complexity out there to me as an entomologist. A botanically species rich patch of land does not equate to a biodiversity rich patch of land necessarily it can do, but it's all about the structure within that habitat it isn't just about the relative abundance of particular key species of plant. So yeah I’m a big advocate of sites and habitats and linking species to while at a bare minimum, the site and, if possible, a habitat within a site because it tells a much more powerful story yeah.

INT: Absolutely that's good.

DEU35: Well, I was just about to say, the biggest thing holding this, the more advanced recording back is the lack of access to decent mapping data. And the boundary information for sites it's all covered by the OS licensing and different people's OS licensing, so it can't exist, it at present in an open form that would allow, I’m not a typical recorder because I’ve worked in the field. Sorry, in the field that sounds that's the wrong term class because I worked in a record Center I totally get the link between the species and that and that habitat or site, so I go that extra mile to make sure that my records relate to a known site in the county, but most of my recording colleagues won't it will be about does it relate which two kilometres square which tetrad it relates to that's probably the best you'll get from most data, unless there is something particularly unusual rare, in which case they might collect a more detailed reference for the little description as to where they found.

INT: Do you do any processing of the analysis of the data yourself before it goes to the record Center.

DEU35: I check it for accuracy, I check that the ID’s are correct I check it for spatial accuracy and I check to make sure that the date matches with you know the photographs if I’ve got a picture of an adult striping grasshopper I know that the photograph should have been end of June to possibly September if we're lucky if someone tells me that it was taken in February, then there's some something wrong either the dates wrong or it's not their photo. But yeah anyway, so I don't do any other analysis I don't really get that much in the way of data, apart from the stuff I collect myself so.

INT: So it's more of a sort of verification process yeah.

DEU35: Absolutely yeah, I mean it would be nice to if I could encourage more recording to get to look at when the species become adults. You know when the first nymph to recorded so you've got the sort of phonology side of things, but it's not something I’ve touched.

INT: How do you deal with data gaps.

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DEU35: I’m not massively proactive, but if I was building towards a try to produce a county atlas for orthopterans then I’d divide my county up into grid squares and target, those records, those squares that don't have very many species because you can have a pretty good idea of how many species each square should actually have so if, when you have your records, you only got one or two but at the moment having said that I’m not doing square bashing in terms of trying to produce an outlet, I go out and record sites that are interesting to me the moment.

INT: I think it's hard because you're doing this on a voluntary basis you want to go out and choose the places that you want to go because you'll know that you'll find something.

DEU35: I got to emphasize the point I have no interest in traveling from where I am to Watford to try and record a field grasshopper from a road verge down there because it's my spare time why the hell, would I want to do that. A lot of my colleagues in the recording fraternity will do that when they're working to produce their atlas that's exactly the sort of trips that there'll be making, but they are very driven by the publication side of things, whereas I’m more driven by site based conservation stuff so I tend to pick out potentially interesting sites, or habitats and then target those for recording.

INT: You touched upon sort of recorded effort is there anything that uses sort of organization are doing to encourage that engagement.

DEU35: And again, I’m talking with my [nature society] how on because we're a very small charity we've only got 400 members, so it is a very small operation we don't have any paid staff. We have a website where we advertise events, so the [wildlife conservation] meetings will end up there, and people can join our list and get invited along.

But we don't really do too much in the way of public engagement we sort of see that as the role of the[wildlife charity]. And we are very as an organization again, not just personally, we are very, very supportive of [wildlife charity] and when the[wildlife charity] organizes the public participation days that they do, then there'll be a lot of us, and in fact they couldn't run it without our help. So, I guess the sort of engagement side of things isn't a big part but we do hold talks and stuff.

INT: Do you share your data with any other audiences, other than some of the local record Centre.

DEU35: With the national scheme.

INT: And how could the data you use be improved to help with your decision making.

DEU35: There is stuff I gather myself, given that it gets linked to a site for a habitat it's probably about as good as it can be right, but I think generally across the board, there's a lot of just emphasis on the provision of a grid reference and then perhaps a village name or the name of a nearby wood or something like that it's very, very difficult to accurately spatially locate those records. Even though they might appear to have a 10-figure grid reference and be accurate to one meter we both I’m sure you know that one meter accurate grid reference isn't going to be that one particular Square.

INT: Yes.

DEU35: It depends, how long the device has been switched on for him one-meter accuracy is beyond the beyond the capability of anything but the most specialized equipment at the moment, so having dealt with records professionally I despair at the lack of checking of that sort of information, you know we get downloads from I record for half a job, I will find that someone's got the wrong 100 kilometre square attached to a record, so it will be for [Town] in Gloucestershire, rather than place within my county but yeah but the grid reference says it's within the county. So I think there's a lot that can be done to try and improve that side of things, I think the verification process on I record as well isn't very good for that, because it doesn't emphasize it at all it's all about is the species accurately identified if it is then nothing else really seems to get checked.

INT: So there needs to be more of a verification process in terms of location and the spatial extent.

DEU35: yeah yeah. Because it's that element, obviously the species identification is the most important thing, but if you can't accurately rely on the spatial location of that record what use it.

INT: That's great so just sort of as a final bit I’m just going to focus a bit more on modelled data. So how do you feel about using modelled data, perhaps in the world with the Natural history of science is probably a bit difficult, but how would you feel about using this.

DEU35: Because I’m a closet computer scientist, I see that there's big potential, but you know it's the old garbage in garbage out. I know you can correct for quite a lot of the gaps, but, ultimately do I trust the models of great crested newts distribution that people are building at the moment no probably not because I know there's an awful lot of field efforts going into gather the data. So, they're probably better now than they ever have been. I guess also I’m massively suspicious of the motivations for the whole way the planning process is going, which is ultimately what these things are currently used for or likely to be used for my vision is somebody that cares passionately about wildlife is for wildlife to be found throughout the areas that we occupy as people, and I think this whole modelling thing really discourages that you get the new the new model for example. If you get some great crested newts in an area that's not the sort of a big newt concentration area, they are sort of an outlier the way the planning process is going those newts will get moved and they'll be moved to “newtropolis” for want of a better term that we grew up together with all of the other news and you'll end up with great crested newts concentrated in one or two places within a county as opposed to being throughout the matrix of the county and that to me goes against what I believe is the right thing for years so I’m yeah pretty suspicious.

INT: Okay, no problem that's great.

INT: Good it affects the type of decision that you would make.

DEU35: What as a recorder.

yeah.

DEU35: I might be in terms of supplying the data to allow someone else to do the modelling. I'd be interested in seeing the results, but I have a horrible feeling that once data supplied your control over it, if there's an expert in a particular taxonomic field, I supplied that right though that data someone used it to model I didn't like the output what control would I have over how those in my view, poorly put together data model outputs were used in a book it's sort of you get the records, if you like, the basis that that model is created upon. And Okay, I could remove my permission for the records to be used, but once that outputs produce those records on needed anyway, so it would be a negotiation process, I think that I’d like to see with the caveat that if the model didn't seem to produce sensitive result sensible results from my point of view I’d like the opportunity to say to not allow that particular model to be used.

INT: yeah yeah that's great and so just finally if you don't mind I’m going to show you some examples of some modelled data that part of the team have created and I’ll just show to them and ask if you can interpret them and then whether you find them useful. So I’m just going to share my screen now. So, I’m afraid it's not for the grasshopper but it's for the six-spot burnet moth. So hopefully, you can see my screen.

DEU35: Thank you.

INT: Hopefully that's a bit clearer. So, the one on the left here don't if you see my mouse, that's a raw probability distribution model on a national scale and at face value, are you able to interpret that.

DEU35: Well, I guess you'll be the judge of that, but I’d interpret that particular species had a south-westerly distribution.

INT: yeah yeah absolutely yeah. You're more likely to find that species in the southwest region and parts of wales as well.

DEU35: But that's to me that doesn't add massively to my understanding of that species because the an old fashioned 10 kilometre square dot distribution map would probably show lots of records in the south and west and hardly anything outside of that area, so looking at it at that scale if that's, the only thing that we're trying to get over with that particular model then it doesn't, in my view, tell me, any more than a simple dot distribution map would do.

INT: Okay.

DEU35: But I’m guessing that can be zoomed in we'll get some more fine scale.

INT: yeah so I’ll just go down. So, this is again a raw probability distribution, but at a localized scale. Around the same species. Those races yeah essentially so around a point in Wallingford in Oxfordshire at five kilometres and again, how would you interpret this and do you find it useful.

DEU35: No, not without an OS background so I can relate to those higher coloured areas were, and I don't know that area of the county but if I had to hazard a guess, I wonder whether that particular species has some particular habitat requirements, is it associated with chalk or limestone or you know some sort of vegetation type that might be trying to pick out I don't the area and without the service backdrop, which showed fields, perhaps, and also contours that might be of use as well, but not hugely useful presented like that.

INT: yeah that's fine I mean this goes back to sort of contextual information doesn't it the habitat, the relationship with the habitats well.

DEU35: The other thing to consider in the top map that you showed I don't remember seeing any sort of temporal, how is that data derived when were those records. Well, where is it derived from actual hard data, did you use moth distribution data to come up with this and if so, what time period was that moth data gathered across because a lot of our species are beginning to change their distribution, so you know, certainly southerly and easterly species seem to be expanding north and westwards, and I suppose the converse might be true or southwest of the species like that might actually have a range contraction or again, I guess, it could also have a ring have a range expansion, so the records that were used to produce that were a snapshot in time. And I don't know whether there's been any not exactly correction, but whether species distribution changes are considered by the model that was put together to produce that map.

INT: yeah, of course. So, I can, although they're not sort of on the map that you can see, I can provide a bit of information on these if you'd like.

DEU35: It might be interesting.

INT: The model on the left, so it uses 21 land cover variables and 19 climatic variables, along with an understanding of the conditions in which a particular species is found, and the available literature, to set the probability of finding the species in a particular location. Most of the variables that the model uses are at a scale of 100 meters.

DEU35: Okay, so fairly fine grained then. Where did the data come from where did the landscape data come from?

INT: It's from the NBN atlas.

DEU35: land cover?

INT: I’m not entirely sure on land cover, I know that the data was extracted from the NBN atlas.

DEU35: That will be the actual species records themselves. So, I guess a whole load of data that didn't have an accurate enough grid reference got discarded, which is fair enough. But what interests me is the relationship between the species records themselves and your land cover stuff.

INT: I didn't create the map so.

DEU35: Fair enough

INT: I can pass this on to part of the team, and I can find out for you and get back to you for something.

DEU35: Oh, thank you.

DEU35: Because I mean being an ex-professional user of this sort of stuff I know how ropey, a lot of the nationally gathered data are on habitat classification, the nationally available data sets and not very fine grained at all, and in fact they don't they just down right inaccurate a lot of the time.

INT: Oh that's absolutely fine yeah like I said I’m not an expert in these but I can certainly find out for you, because I know that they’ll be able to give me an answer straight away. So, I’ll get back to you on that and should be able to get back to you later today, hopefully.

INT: No, that was brilliant. And then if we move on to the one on the right, then. So, this is a variation model and this one sort of works, alongside the raw probability distribution model as well.

INT: At face value, are you able to interpret that.

DEU35: No, because I’m not sure what the title names I get what a probability distribution. I'm not really sure what's meant by variation.

INT: So, clarification as to what the variation is on. This is an issue that's come up.

DEU35: And when I look at that map. I find it less easy to interpret and it almost looks as though there might be some element of altitude, being an important factor in terms of its distribution, looking at the areas that have higher shading classes, like, I mean it's not exclusively, but because this stuff over in [County] that's still a fairly deep shade of pink or peach or whatever the colour is.

INT: yeah that's great. Essentially, this model is showing the confidence that you have in the raw probability distribution so where areas are darker on the variation model and there's a greater variation, so you have less confidence. So, if we look at wales, for example, although on the real possibility, there is that it shows a likeness of this species being there on the variation model. You're less confident in that.

INT: Now, and again I can provide a bit more information as to how the model was created if that would be useful.

DEU35: yeah Thank you.

INT: So the variation is calculated using a song called the background data to give a range in the predicted probability so for this model, it was run 10 times on 10 different data samples which include some points, where there our target species records and some, where there are records other lepidoptera species, but not the target species. Points where the targets species was not found are used effectively as absence data.

DEU35: Okay.

DEU35: yeah and that but that's this that's a stretch isn't it because it might just mean that nobody's been there to look.

yeah.

DEU35: I’m pretty, particularly if we're using hundred-meter accurate grid references quite a lot of recorders will visit you know, a patch of.

DEU35: Land they'll take one grid reference.

DEU35: And it will be hopefully if you're lucky in the Center of the park they won't record every single sighting of the species within that park they'll just use the central grid reference and then you might get a numbers count added if they find five of them was wandering around, for example.

INT: No absolutely and just quickly, this is a localized scale again the variation model for the same species and does the same apply, of OS maps and contextual information.

DEU35: yeah no absolutely yeah I'm a local recorder, I want to know where that is because if I don't it's not really informing me at all I can't target I know those look like our script squares around the edge, so I could derive that information work out for myself where that stuff was but in terms of usability it would be a lot easier if there was an OS background or if that was spatially reference stand up loaded as a layer on a website that enabled me to serve changes, transparency in zoom in and look at the land beneath it.

INT: yeah absolutely did you have any other comments on these.

DEU35: No, I'm not sure that, I've got enough information about their background, if you like, to add too much more.

INT: yeah absolutely but like I said I’ll find out about the Land cover for you and get back to you soon.

DEU35: Thank you, what are the species requirements for that.

DEU35: Well, is it found in a particular habitat type, for example, of course, yeah. Is it a generalist but it could be a species or relative species generalist but it might need them a certain minimum winter temperature to be able to survive in whatever form, is in the winter.

INT: yeah so I’ve got I’ve only got a little bit of information here, of course. So, it's locally distributed in southwest of England and Wales on damp meadows marshes and secret.

Okay.

INT: yeah that's all I’ve gotten written.

DEU35: that's fair enough, I used to work in [County], and looking at the darker green that corresponds quite nicely with what they'd call colon grassland down there, which is exactly damp meadows which funnily enough it's another name for roast pasture which describes the darker green areas in the southern bit of Wales around Pembrokeshire and stuff so. Without habitat context and the knowledge of the area, you can put two and two together and hopefully come up with a sensible answer.

INT: Right and that's great.

DEU35: And that would work for the more detailed zoomed in version. Is as well if they did happen to correspond with wet meadows.

INT: I would just say that these are very much starting points. And it was just these are sort of created to sort of show people that I would be interviewing like yourself know what is useful to you and what needs to be added and included to make it of use potentially yeah so no that's great.

DEU35: And then going back to my point about newts I would still have the same, this is very interesting, and I can see how it might help inform field work.

DEU35: But I would be very, very nervous about basing any form of planning type decisions on outputs like this, which is my main criticism of the whole new modelling thing it's those outliers populations that will just get lost by this sort of approach. Close to me I think they're important and worth trying to do something with them.

INT: that's brilliant absolutely and I’m just going to stop sharing my screen if there wasn't anything else. And so I’ve asked all the questions that I wanted to ask and was there anything that you wanted to ask me at all, or you thought I should have asked you.

DEU35: No probably not. My particular hobby horses I’ve had the chance to get on them. What is the aim of this, you know, are you just going to try this approach with I don't know moths are fairly well recorded it's very difficult, with a lot of the NBN and data to know how it's been gathered, I know there are some statements around the organization's make about how comprehensive, it is, and also survey effort was taken, I mean that one's a day flying off so other species that are attracted to moth traps, for example, you're calling them in from outside of their habitat in a lot of cases, so this sort of approach might work quite well for things that don't necessarily have that sort of recording bias, whether recorders action changes the local distribution, if you like. Well, actually, I live in [city]shire but if I stick a moth trap out here, I probably don't attract too many species from miles around because it's so bright here, but you know over in the West, where it's relatively dark if you put them off trap out. You'll get moths in from a kilometre away. So, you're not learning anything about the habitat that you've put your moth trap in you're just learning about what's around it. So yeah I guess with all stuff garbage in garbage out and it's just about making sure that you choose the right species to not just the right species, but the right recording groups that have had the appropriate recording effort to enable the modelling.

INT: I mean yeah at the moment I think they’re just focusing on sort of mastered the moment I think there is actually side element of grasshoppers so trying to be included as well, actually.

DEU35: That would be really cool I wouldn't mind having a look at some of the outputs.

INT: Of course yeah I can because I got these sort of model data outputs for the moths quite a while ago, and I know that they were sort of trying to create similar ones for grasshopper so if I can find some and I’ll get back to you on the land cover maybe send them over to you.

And maybe yeah you can just have a look at them. I’m sure as the sort of project expands so it's a two-year project and we’re in the first six months, so I think obviously they're still trying to increase the number of spaces that they look at financially and unfortunately, in terms of sort of my role in terms of understanding data needs and that's sort of coming to an end now so and I’m not really part of the sort of application side. But if this is something that you're interested in, then there is a mailing list that you're able to engage with and then you'll be able to be kept up to date with information regarding the projects.

DEU35: Okay, great thanks yeah.

INT: So yeah, I’ll try and find that. The grasshoppers I’m pretty sure we're starting to do one and as I say, if I can sort of fish that out for you.

DEU35: yeah lovely.

INT: Great and I’ll get back to you on those and I’ll send you a link to the mailing list if that's something that you're interested in.

DEU35: Great Thank you.

INT: Okay, was there anything else.

DEU35: No, no, no that's not so good luck with the rest of it.

INT: thank you.

DEU35: And you’ve got report writing to do once you've once you've had all of these interviews.

INT: As the so currently in the process of writing a report and a scientific paper as well.

DEU35: Good stuff were you hoping to publish that.

INT: I think that's still yet to be decided.

DEU35: No, fair enough.

INT: But me and my colleagues are sort of on that, I think. And so that'll be deciding soon, and I, and thanks, very much for speaking to me and I really appreciate you taking your time.

DEU35: No problem.

INT: And yeah, I’ll be in contact with you say.

DEU35: Okay, great.

DEU35: Thanks Okay, good luck with the rest of it.

INT: Thanks so much take care.

bye.