INT: So it might just pop up there for you to confirm yeah that's great and so just to start off with could you just give me a bit about your background and your role within the organization or any other organizations that you're affiliated to.

DEU24: I got into this because I was partly responsible for creating an organization called [business and academic member organisation]which is about 45 of the biggest businesses in the [city] area and big in [city] means really big billion dollar companies plus the universities plus the hospital and it commissioned an independent economic report for the county which didn't really mention the natural environment, so I protested and managed to get that corrected and decided I would set up a workshop about what actually needs doing so I brought together some experts on the natural environment, together with local authorities. And what they said was that it was a very good meeting. I didn’t actually think it was all that good, because they didn't come up with any actions. But the Chair of the local nature partnership heard about it and said let's work together. So we set up another meeting in January 2019 it must have been and that was another good meeting and they all said let's do this regularly so we set up this meeting every three months until March last year we had to cancel it, of course. And I thought, in order to keep in touch with everybody I would send out every week latest news about issues to do the environment.

And then we revived the meeting in June on zoom but because it on zoom we thought we'd throw it open to everybody, not just local authorities and something like 80 people have come to the meetings every quarter since. It was decided that we'd lost something by not having meeting just to the local authorities so last week we revived that and all the local authorities in the county came and I think that will continue every two or three months. The main thing that came out of all this is a vision to double nature which has been endorsed by all the local authorities in the county, including the combined authority. And it's also been taken out by the authorities along the [city], [city] ARC you heard about the ARC have you. So, we're all very keen to double nature, the big problem we have, which are being put in [name] a colleague from [wildlife charity] is higher actually measure progress on that. And the first question is, how do you measure what we've already got, and you know any to well, the problem with data. First of all, is you either have far too much or too little and second you don't know whether that what you've got is correct. So, we're grappling with that at the moment.

INT: yeah absolutely. that's great. So I’ll move on to the purposes of using species records data now, and so do you focus on using single species or species groups and also in terms of the spatial extent is it just around [city] here on a national scale.

DEU24: So, we're interested just in [city] but whatever we do, I think, would be probably taken up by the local authorities and on the [city] ARC. We're talking to a body called land app, have you come across them.

INT: I haven't no.

DEU24: They have data they take data from DEFRA and from [environment organisation]and particularly related to farmers so they have data about what the farmers are trying to do with the environment and the environmental money they're getting and they hope to use this to help farmers in the future work with elms you know about elms presumably. They’re very keen to work with us but at the moment we’re not clear whether this will be useful or not.

INT: What decisions does species record data inform you on.

DEU24: As I say, we want to double nature, and that includes increasing the area of grassland, of trees, connecting up habitat. Finding more species using the habitat anything you can think of.

INT: So, in collecting this data, where do you obtain it from.

DEU24: So, at the moment we only have our friend in [wildlife charity], [environment organisation]and the various partners of our local nature partnership.

yeah.

INT: Does this come to you as a raw product or has it been mapped or modelled in any way for your use.

DEU24: There are maps, I can never work out one of the maps. I said it's so difficult to get what you want, out of data.

INT: Do you find raw data then easier for you to use.

DEU24: I think it will be essential to have raw data so that we can then process to extract what we want.

INT: Absolutely yeah. Is it good to verify as well by using raw data.

DEU24: Well, the only way I know to verify is to get different people putting their data and see whether they’re the same. They call it ground truth thing but that's hard work.

INT: Do you use different resolutions of data, or do you require a particular type.

DEU24: that's one of the things we're still trying to discuss, what is the right resolution to be meaningful for the answers of our ambitions.

INT: Has this discussion talked about what you would prefer or still in talks.

DEU24: What respect.

INT: What sort of resolution would you prefer going forward.

DEU24: I think what we probably want to do is have something on a fairly broad resolution was set up a system whereby if anybody does something to improve, they can get credit for it.

INT: Do you or any of your colleagues do any of the processing or analysis of the data.

DEU24: Well [environment organisation] I'm sure does. The trouble is, of course, when I say Natural England, it depends, who you talk to. And there's a tendency for the others not to know what the others are doing.

INT: How do you deal with data gaps.

I think a lot will depend on the Farmers. We can try and, the NFU is one of our collaborators, hoping that we get help from them.

INT: So, what do you do with the data when you have processed and interpreted it.

DEU24: But eventually we will want to, as I say we work with the local authorities, and we certainly want to inform them because they're going to have an obligation to the environment bill and they’re going to find it very difficult to carry those obligations out, so I think one of the discussions is how we can coordinate all the local authorities and possibly help them. And then also we would just get publicity to everybody about progress.

INT: Do you engage with volunteers at all or with citizen science projects.

DEU24: Volunteers are quite important.

INT: Do you have any events or campaigns that encourage this engagement.

DEU24: So, it varies a lot from area to area and the area around [city] is working very closely with volunteers. We need to try and spread that more throughout the county and that's something that some of my colleagues are working on. We’ve also come across an organization called co-farm, have you heard of them? They get a lot of volunteers to grow food or quite a small area and they managed to grow huge amounts of food or hardest one area.

INT: Is that in [city]shire.

DEU24: So, there is a pilot in [city], but they want to spread it through the country, I think.

INT: yeah absolutely.

INT: Is it agriculture, is it livestock.

DEU24: It’s food, its vegetables, mainly.

Okay.

DEU24: Probably horticultural rather than farming.

INT: Yes, okay.

INT: For them that's interesting.

DEU24: Because one of the issues is how you keep the site in good condition. And it seems to be quite a move to say that you've got to have some sort of livestock to help that.

INT: There’s a close relationship between livestock and soils.

INT: And what kind of audience do you share your data with.

DEU24: So, we threw open our workshops to everybody. I’ve now got a mailing list of 320 people who want to participate in various things and then all sorts of people, including people from business.

INT: How could the species data that you use be improved to help in your decision making.

DEU24: Well if we could show that the number of each species and number of species that increased that will be a plus. Of course we’ve also got the reverse direction to worry about.

yeah.

INT: Excellent.

INT: Is there any additional information that would help you to interpret data.

DEU24: I think we're still struggling with that.

yeah.

DEU24: I’m only a particle physicist I should tell you. I just got into this by accident.

INT: involuntary participation.

DEU24: I’m used to handling particle physics data but I’ve learnt a lot about the dangers of data.

yeah.

INT: How would you feel about using modelled data, instead of raw data.

DEU24: Well, certainly data and if it's from being processed.

INT: And would this affect the type of decisions that you might use in data.

DEU24: Well, one of the things we've got to do is persuade people to invest and getting data, I think, is essential for that. And of course also like I said, the farmers they're going to have to make decisions about how they want to make applications to ELMS.

INT: So, just as the final bit of the interview I’m just going to show you some examples of modelled data.

INT: And I just want to see, if you can interpret them and then, if you find them useful so I’ll just share my screen now.

INT: So hopefully, you can see that.

DEU24: No.

INT: yeah good.

INT: Are you able to see these ones here.

DEU24: I can see two maps.

INT: brilliant yeah So these are on a national scale, and these are for us five spot on at math.

or.

INT: A five spot burnet moth.

Oh.

INT: And may or may not be of interest to you.

INT: But.

INT: These are the ones that the modellers have used and so you've got a row probability distribution on the left this one here.

INT: Where my mouse is and.

INT: Are you able to interpret that at all.

DEU24: looks like the southwest and the west of wales are the best places to find these.

INT: yeah brilliant so essentially a heat map and would you find this useful at all.

DEU24: I think on a finer grain yes.

INT: yeah okay.

Or county level.

INT: county level yeah excellent.

DEU24: One of the problems I have is maps like this unless you are really good at geography, you don’t know where the towns are.

INT: Yes, okay yeah that's a great point.

INT: So, some additional layers in the mapping.

DEU24: One or two points to help you exactly where you are.

INT: yeah absolutely.

INT: I think, certainly if you were to do it at a county level, this would definitely be necessary but even at a national scale like you say.

INT: that's brilliant so I’ll just go to this one, so the one on the left here so that's again a raw probability distribution but it's around Wallingford in Oxfordshire at a five-kilometre scale.

INT: Is this useful at all.

DEU24: That would be I’m sure very useful.

INT: Is there anything that you would add to this model that would make it even more useful.

DEU24: Well, again I’ve got no idea where Wallingford is

INT: I had a feeling you’d say that.

INT: That's great. So now I’ll just move to the one on the right. So, this one is a variation model.

DEU24: One of the things you have to realize is a very large fraction of the population have difficulty with colours.

INT: Yes, I have found this.

DEU24: And how you deal with this is quite a challenge.

yeah.

INT: The colour system has been an issue a lot. So, yeah no you're not the first and.

INT: Are you able to interpret this one at all, the variation model.

DEU24: Well, it looks like Wales and Scotland and around the wash.

INT: yeah that's good I’ll just give you a bit of information that the modellers have passed on to me and so it's calculated using a sample of the background data to give arranging the predicted probability. So, this model was run 10 times on 10 different data samples which include some points, whether our target species records and some weather records for other lepidotera species, but not the target species. So, the modellers have recently combined the probability and variation data so that they're able to show areas, whether it's both high probability of presence and high uncertainty.

DEU24: One of the problems I have with data is that people present and don't tell you what the errors are and particularly with models, as you tell me they run the model several times, I would want to know, how different the outputs are of each run.

INT: Okay yeah of course yeah.

INT: So, like a breakdown of each run.

DEU24: Well somehow, you’ve got to work out how reliable this is.

INT: Because and then whether you would trust it in in that sense

DEU24: As a particle physicist I am particularly sensitive to that and there was a very important quantity that was measured by my experimental colleagues, and it could be anywhere between 0 and 0.75. The first experiment, the answer was 0 with some error. And over the year has gradually increased, and we now know that it is actually 0.75.

INT: So yeah there's always going to be variation.

DEU24: I’m always very irritated by the Office for national statistics which every month gives data about the GDP, and you’ve got no idea how accurate what they say and they always change it the next month. And that they say they can't give errors because politicians want definite numbers.

INT: that's a very valid point and that's great.

INT: And was anything else that you wanted to comment on these.

INT: So I’ll just stop sharing my screen now.

INT: So I’ve asked all the questions that I wanted to ask and was anything else that you want to tell me that you perhaps I should ask or were hoping for me to ask.

DEU24: What are you aiming to produce.

INT: So we're aiming to, we’re in talks of producing an APP. To help improve the modelling for biodiversity data users. So, the part of these interviews is to sort of gather people's needs and people's uses of data and we're also trying to establish sort of profile of various audiences that we need to target and so I’ve, as well as yourself we’ve talked with environmental consultancies, local authorities, ecological consultancies, conservation groups and utility groups as well. So there's a wide range.

DEU24: You missed out farmers there.

INT: Yes, well, we have been trying to get in contact with farmers, but we were struggling I don't know if you had any contacts at all that.

DEU24: Well, we work with a local area manager of the NFU if you’d try and contact there national.

INT: We yeah.

INT: We have tried that with to no avail, unfortunately, but we'll try that again.

INT: yeah.

DEU24: there's also the country landowners association.

INT: that's great and.

INT: Was there anything else it's all.

DEU24: will be interesting to see what you produce.

INT: yeah of course, well we'll stay in contact with you if this is something that you're interested in.

INT: And yeah.

INT: we're having a an in-depth meeting next week to decide where the project will take its next steps.

INT: So I’ll definitely inform you after that.

INT: Good good.

INT: Well, thank you very much for taking your time space today.

INT: I really appreciate it right.