INT: so firstly, I just want to talk about your background a little bit. So, what is the name of the organization that you work for or affiliated to?

DEU10: So, I’m one of the wildlife conservations officers and work for the [National Park].

INT: And what is your role within that organization?

DEU10: A lot of our role is proactive, targeting of land management for positive conservation and also reactive in terms of planning applications, woodland applications, new native woodland applications. We also do a lot of public engagement, coordinate and undertake lots of different server work for habitats and species.

INT: In terms of the public engagement what instances are there that you do?

DEU10: One of our statutory purposes is to promote a better understanding of the national parks, so you know it's all linked to that. So, there's a lot of social media, especially with covid there's a lot of, stay home stay safe stay local, all those kinds of messages. So, there are sort of generic ones that run through a lot of our work, and then the things like at the other end of the spectrum we have things like the [wildlife project], which is a partnership with [wildlife conservation organisation] where in a normal year we would have telescopes set up helping to show people [species]. There's also a lot actual projects like that, as well and there's a lot of things in between that that software fulfil our raising awareness and statutory purpose.

INT: So, I’ll now move on to the purposes of using species data, and so, what do you focus on particularly or is it a general scope?

DEU10: A lot of our work, a lot of the data that we use is for like I say, the main bulk of the work is things like Agri-environment schemes, so we work with natural England to help farmers come into the agreement, so we use habitat and species data to determine what species habitats have got a lot of living and then either instigate survey work, for a particular element of that or if we know the species which show meadows on the file, we can look at whether it meets the prescriptions of the Agri-environment schemes, to actually deliver that management. We're also involved in, internally, being consulted on planning applications, so we cross check that against habitat and species, and I think one of the ones that will become more prevalent and high profile in the coming years is we're consulting new native woodland planting. So, we will get consulted on areas. We have a we have a trees and woodlands team, so they will internally, deal with a lot of woodland planning applications, but will also get consulted on external ones. So, when there's areas of new planting being proposed, we will constraints check that against species and habitat data.

DEU10: Quite a lot of our work is you know this is sort of not necessarily daily but it’s week to week, so it is quite a large proportion of our work.

INT: Is that because you need to keep up to date with what's going on?

DEU10: We want to make sure the data is, wherever feasible, as up to date as possible, so that's the survey work, I should say that some of the survey work, as well is looking at trends, so we have management plan targets, which again is a statutory document that we have to produce, so we do do some species monitoring, looking at the trends of species, as opposed to just distribution. But they are sort of routine work for the Agri-environment scheme work, planning and woodland consultation so again it's not every day but it's a regular occurrence.

INT: Where do you obtain your data from?

DEU10: A mixture really, so we've tried not to be a data holding organization, because we don't want to duplicate the work of others and we're just not set up to do that.

DEU10: We use data on the [environment public body] website and the [natural environment information]website that's quite an important one for us, we also have our own habitat survey that looks at priority habitats outside of SSSI’s. A lot of the work natural England has done is in the SSSI’s and about SSSI management, so we tend to focus on sites outside SSSI’s for habitat surveys. We do do some species survey work, and again wherever possible, we look to try and follow any national recording schemes or national surveys, we don't want to duplicate and try and reinvent the wheel with any of this. We work closely with [wildlife charity] on a lot of species issues, management issues, so we get periodically data sets on priority species mainly Northern Brown Argus, Small pearl-bordered fritillary so they update the GIS layers and then they send us a layer each year, so we can cross check it.

INT: Do you have a particular focus say on rare species at all?

DEU10: Our biodiversity action plan finished at the end of last year and we are just writing a nature recovery strategy. We have a national park management plan that talks about our objectives for priority species and habitats, so there are two of them and they'll be redefined for the new nature recovery strategy, but there are a list of priority habitats which are more or less identical to the ones that natural England classifies as priority because it's the old or what were the old BAP habitats and then there's a list of priority species so things like Black Grouse, Curlew, Northern Brown Argus. We would cross check these to make sure there's no potential conflicts.

INT: What format does the data come to you in, is it raw data or is it processed in any way?

DEU10: It tends to be a process form, so what we ideally like is for the GIS to just share the file so we've just got habitat patches as a colony or point data that shows where a particular species is. So, we don't really have the resources to do a lot of data processing, so we really, we need a finished product rather than spreadsheets or databases or however the data is stored.

INT: Is that because it makes it easier for you or because it's more detailed and makes your work more effective.

DEU10: We need clear data so when we are checking or doing constraints checking we need points on maps but one of the difficulties we don't want to end up trying to interpret somebody else's dataset, so we need a product that is very clear that this shows that the habitat patches where Northern Brown Argus are present and then any date checked on number of butterflies are or anything else, like that, so we need it in that format, we you know we can't be cross checking individual survey forms or anything like that to try and pull together. We do it for our own surveys that we're coordinating or directly involved with but we just don’t have the resources to handle raw data like that.

INT: So, what resolution of data do you use?

DEU10: It depends on the species or habitat but basically it will be field scale. So that would be a particular field that is a species rich grassland or knowing whether or not that field has got breeding Curlew in it. For some of the stuff, we might have for some of the invertebrates or plants there's actually 8-10 figure grid references for real, specific species and where they were found but most of the species, especially birds that do move around that that'd be one field one year and one field the next. It doesn't really work for them other than for plants and some of the vertebrates which are incredibly sedentary.

INT: Definitely depends on the species that you're interested in.

DEU10: We would normally cross check it at a field scale. So, even if it was point data, we would say that field has got species X in it.

INT: What information do you use to inform your interpretation of the data? So how do you deal with data gaps, for example?

DEU10: That's a tricky one so there's not always resources to actually, so if we are constraints checking then we may say there is no survey data for that. We're starting to look at using some of the habitat suitability models a bit, so we've just had 1 done for Curlew for the whole national park. But there's a lot to work out in terms of, at the moment, everybody works on knowing exactly how many of a particular species or habitat so when you're looking at a new native woodland, if there isn't any survey data we cross check it against the for example of magic layers so they have their upland breeding layer. So, if it falls in that the forestry Commission guidelines requires a survey to be done so somebody will go out and survey, and you'll find whatever you find.

DEU10: A huge gap I think in terms of how you interpret the habitat suitability models. What does it actually mean when there's a 75% probability of Curlew being present? Is that one pair is it four pairs? For example, in an area that's really high probability, we might say a lot, we really do think there's a survey needed but, at the moment, because these are fairly new there's no real consensus among all conservation organizations about what and how it should be used.

INT: How would you consider accuracy versus completeness?

DEU10: Do you mean in terms of record verification.

DEU10: Well, if it’s done to a standard survey methodology by a recognized consultants or something like that, or if it's from a national survey, then you know we take the survey results that are given to us as verified and genuine. We did use a while ago when we had a data agreement with the record Center that it did crop up about what you do about an unverified record. If there there is an unconfirmed record that is maybe you know 50-60 years old, this is difficult to know quite what to do with it. Or things like water voles, so as far as we're aware and well there’s been a reintroduction site, but all the surveys that have been building found no water voles in the National Park. Yet, you'll get on some of the data Center records, you know you'll get a record right in the Center of the national park of a water vole it's like you extrapolate that it is highly unlikely that that is actually a water vole, rather it's probably a misidentification. So, there is an issue about using other data sets about whether or not a record is verified.

INT: In a sense, there can be a bit of confusion?

DEU10: So, like I said for water voles other than one site that we know of I can't imagine there’d be any water voles so it's difficult to know that if you get, a third party, through the record Center or the NBN

how robust is that record and with the objection of a planning application or a woodland planning scheme, you need to be confident that the record is genuine. You can't just say that there's an unverified record of a water vole from 1958 or something like that. The validity of the record is crucial, especially as, in a worst case scenario if it was a big development or a contentious development and you’re were objecting on the nature conservation grounds and you need to be sure that record is genuine.

INT: If there was a planning application, would you have to go on to that site again to make sure, even if it had already been done, say, a week or two weeks ago.

DEU10: Generally speaking, because we use verified records, even if it's a few years old, we assume that it's there now and the mitigation should follow, assuming that it’s there. We don’t actually do the surveys, for planning, we just assess the surveys that come in, so we have checklists if you're doing certain work, you need to do protected species or something like that. On quite a few of them, the consultants will do a survey that's very recent but on some of the constraints, if we know that it’s there, then you can put in the mitigation. You can work on the probability, if there was a healthy population a couple years ago, then you know they're going to be there. Things like bats still use roosts and just because you don't find them they might use alternative roosts in an area so just because they’re not in a roost when you actually survey, if you know that there is a roost you can you can protect it that way.

INT: I think you've alluded to this already, but what do you do the data once you've processed and interpreted it?

DEU10: We have it on our GIS system, so we'd have a series of layers on there.

INT: And do you share your data with any other audiences at all other than the ones that you've mentioned?

DEU10: Yes, so we fall under the inspire regulations, so all our major survey data and habitat survey data at least some of the species data is publicly available through that. I'm not directly involved with the data management, so I don't know the exact details but it’s either on the data centre or it's publicly available somewhere. But there are sensitive species data that an information like peregrine nest sites that we would not make publicly available. But we would share with another appropriate organization, [NATURE CONSERVATION CHARITY] for example. But those sensitive data sets of your rare and threatened species are just not made publicly.

INT: So how could the data you use be improved to help in your decision making, so, for example, would it be helpful to have data at a high resolution?

DEU10: As long as it's field scale, so if you get a property or an are they want to plant in and providing it’s at that resolution, it helps but I don't think it would improve it greatly. I suppose it depends what you're talking about in terms of, it was habitat you just need to know the boundaries of that or if it's a colony. I think one thing that would be very useful that is difficult and very rarely recorded, is nil returns. So, if you go on to the example of the water vole one, the record you get is in the middle of it, so what you don't know is, if you get an application or consultation above or downstream from that. If that was a legitimate record for the sake of argument you know, does that mean that the whole river catchment has been surveyed. And the only place you found there is no right bang in the middle, so if you get an application upstream or downstream, you can say there's no direct effect. Or is it just a random record that basically this that species are all along the river system it's just that somebody just happened to come across it at one point that's where it would be useful, so knowing when an area has been surveyed and that particular species hasn't been found is incredibly useful. Like I said in the example, and if you only get one record, we might say, well you know the consultants or the developer needs to do surveys, because we know it's on that general area, but if the area survey, we know the areas been surveyed and it's only found that one place and we don't need to put them in place, and all that information will be useful.

INT: So, the final section of questions just looks focuses on modelled data a bit more. How would you feel about using modelled data?

DEU10: I think the potential is there, like I said, I think, for a lot of my experience it is it's more about the interpretation of it. If you go out and do a wader survey and you find that the three pairs of Curlew in that field, then everybody can equate to it, and a decision can be made. Whether or not, if that was going to be planted with woodland, for example, is it more beneficial to plant the woodland and lose three pairs of Curlew or is it more important to protect three pairs of Curlew. The distributions in the similar fields, you can work out and it's clear. So [wildlife charity], for example on the magic map where they have the Upland breeding wader layer, they have criteria of two pairs of waders of two different species. If they’re present in those fields, it becomes eligible to be put on that layer, so we've been working up to now on pairs and individuals. Whatever the recording unit is for that particular species, I do think there's a piece of work to be done either nationally or centrally or whatever to look at how you interpret the suitability models so, for example, if there's a 68% probability of Curlew being present in that field in the previous example. Does that mean you can't plant trees, you should plant trees, the sort of mindsets not there at the moment, because these are relatively new sort of pieces of work as to how that should be interpreted and what the sort of threshold that ought to be. Now whether that that might be, for example, if it’s over 50% probability in either survey I don't know if it's less than 50%. You don't need the survey done there's no sort of criteria for thresholds for suitability modelling, so I think it’s not the models themselves, and I think there's an issue that some of them are better than others, depending on the amount of information and different datasets you put in.

It's out of my area of expertise and the actual technicalities of it, but any model is only as good as the data sets you put into it, but like I say once the models been finished and handed over its the interpretation side of it, so I do think it would be useful to have a piece of work done on the thresholds.

INT: You want the modelled data to essentially inform the person using it?

DEU10: Putting together the model is like an academic process there's different ways of doing it different methodologies, you can ground truth it this is an academic process to actually you know pull it together and come out with a model. As a user of those models what we basically want at the end of it is almost a yes or no. If it's for a habitat, there are habitat network maps that are quite easy to use so you've got an area of woodland, you can buffer it and put a 100 meter buffer on it and begin woodland planting that's relatively straightforward, but the actual suitability models is what does it mean? What does that probability of a species being present need in terms of how we make a decision.

INT: It's almost like a definitive answer you want from that.

DEU10: There’s no definitive answer about how many how many pairs of breeding waders there is in a field before you don't plant it, for example, but there's things like extrapolating data as a density compared to national studies are low in your local, national or regional importance, so there are things you can do to give you a feel and, but I think that's because they’re new that's lacking with the suitability models. From a user point of view, again it's not a criticism of any of the work that's going on, because it's all brilliant but when you're faced with a 65% probability 68% probability of a species present does that mean that we refuse planning application. Does it actually mean how many of that species are absolutely there? There will obviously be a link with the higher the probability that more like that there's higher density but again, without that that being there, that is, they're not being used as much, as well as they could because that assessment process is not there.

INT: I'm going to show you some examples of modelled data outputs that part of the decide team has created.

INT: I’m no technical expert on these, so do bear with me.

DEU10: You're in good company so you’re alright.

INT: Are you able to interpret the one on the left?

DEU10: On a quick glance. So yeah the higher there is a probability yeah.

INT: That it's the role probability distribution.

INT: Of the six spot burnett.

DEU10: was wondering what.

INT: That is, and then.

INT: So the scale on the.

INT: rise of the graph.

INT: So obviously greener higher so it's not one closer to one, the more likely they're there.

INT: yeah yeah.

INT: And this is.

INT: Exactly the same.

INT: But around a five kilometer points in Wallingford in Oxfordshire

INT: For the six spot burnett as well.

INT: So they're quite straightforward, are you able to interpret the one on the right now.

DEU10: it's not as partly because try and move my.

DEU10: Be dialog box screen share thing was all.

DEU10: Not as straightforward just looking at it.

INT: So, the variation which this series is calculated using a sample of the background data to give a range and the predicted probability. So, in this case the model was run 10 times on 10 different data samples which include some points, whether a target species and some where there are records for other level Dr species. Modelers have recently combined the probability of variation data so that they able to show areas, whether it's both high probability of presence and high uncertainty.

INT: Does that make it any clearer?

INT: yeah okay.

DEU10: that's great.

INT: And again that's just around the point in [place] as well.

INT: and based on these examples.

INT: Is there any information on that is not sending images that would be useful to include?

DEU10: I think again, it goes back to it's not the data itself it's the interpretation of it. So, on the top left one of the you know the UK map one. If you were organising the national survey then that's really useful because it shows, and again, depending on whether you want to do random squares or whatever, but if you're actually looking for that species, then that that sort of information is really useful because you can obviously hone in on the sites where you might like to see it. But in terms of how you can constraints check again to go back to the same point really is what does that actually mean so in terms of and the sort of the lower you're getting the probability and again, if the burnet moth was a protected species, and wasn't like a dormouse or great crested newt or something like that, and you needed to do a survey get a license for development, how would that affect your assessment of whether or not a license was required, or whatever survey, was required so that's the issue with probability maps for me is there's no real sort of guidelines or widely agreed framework or anything else, like that to follow.

INT: That's great and any further comment for the one on the Right?

DEU10: Once you work out exactly what the sort of the probabilities are and the colour codes show, I mean if it's combining models and things like that it will obviously be a stronger model to us, but I think the same principle applies as to in terms of whether or not you grant planning permission or allow woodland to be planted its those sort of threshold levels that still think of the ones that need some further interpretation. Again, it's like if you were a conservationist protecting this species, you'd say that right everything of I don't know if you know figures anything over 25% should be looked at, and we should protect it. If you're a developer it'd be well and if you're not you know, unless it's got 90% probability of being there, then we can start to crack on solving so it's those sort of thresholds that are on the interpretation of the data that I think needs more another piece of work or some guidelines.

INT: You talk about these thresholds; this presumably has to occur on a national scale.

DEU10: Again, this is where everything like this in my experience when you talk about low, medium and high probability, great, you don’t plant trees in an area of high probability of Curlew. The principles are okay, but it's then when you actually got the plan in front of you, and you have to write, yes or no it’s where does low start stop and medium begin it things like that and again a lot of these things are often always not always crystal clear, but I think with the suitability model, there is just complete, there is no studies or there's no baseline reports or anything else, like that you can actually sort of judge your comments on.

INT: I have covered most of what I wanted to talk about which is brilliant, was there anything else that you wanted to tell me that I’ve perhaps forgotten to ask you?

DEU10: I think talking to [Name] before and the sort of situation we're finding ourselves in now is how we interpret the suitability models, so I think the other questions that I think as a user if any end product comes out having some attached guidance or something on the interpretation of the models that now whether that's done by third parties, natural England, [NARURE CONSERVATION CHARITY] you know specialist advice to work that out, in an ideal world, that would be something that would be really useful rather than you know I mean it, happens with planning applications and consultations all the time, but it's a lot easier to get your head around it number of pairs of how big a colony is. In terms of us trying to assess how important that is in terms of you know constraints checking whereas it's not as clear with the probabilities.

INT: I think the interpretation of models like you said it's very interesting point. Just finally the next stage of the project I don't know if he was speaking to you about this tool, yet, but to working with people like yourself go design the data models. Would this be something that you'd be interested in.

DEU10: I think potentially yeah and, obviously, you know if there is any opportunity if he could or you feel it'd be appropriate, then let us know and we’ll check through with senior management and all that sort of policy. From my perspective, if there's something that we could help with that leads to better a better system that makes it easy for us to interpret that data then that would have obviously key long term benefits so it’s something we would obviously be potentially interested in but it all depends on you know time cost.

DEU10: We are constraints checking on a few different initiatives on a regular basis, so these sorts of things it is incredibly frustrating when an end product comes out and it's a great piece of work and all the maps you've just shown are fantastic there’s no complaints about how they’re derived and if announced like that, but again it's just the end. Somebody somewhere has got to use this to say yes or no us to whenever something goes ahead, so the more information that can be provided and that, so those decisions can be made, consistently. I mean the other thing is people interpret them differently. For example in the National Park, you know if we say anything over 75% probability you need to survey and then outside the National Park there might be a site two miles away, they might say, well we'll just say anything over 40% and you've got the the same contractors, the same developers who say, well, you say 75 they say 40. These are the issues that crop out and how you interpret this data as an end product so anything that can be done to try and like I say it might be that if, on the burnet moth, it might be that butterfly conservation come out with a series of recommendations. I mean a good example would be to look at the barn owl mitigation, that the Barn owl trust have provided for planning this endorsed by natural England so basically again it's a lot more simplistic, but there is a very simple sort of matrix there. If you find evidence of barn owl that's older than two years you need to do X, you know if the barn owls have been present in the barn within two years, you need to do X, Y. If there’s barn owls nesting you need to do X, Y and Z so there's a clear framework there that we can work so when we get something in we can cross check the information that's provided to us. That's through field surveys, rather than probability models, but you know that can be sent to developers’ consultants to everybody who’s working to the same framework. So if there was something like that could be done and I get it will vary between species, but you know some of them if there was this similar generic metrics so that everyone was on the same page, a consultant would know that we're objecting to this because it is over 75% probability you’ve not submitted a survey rather than, as you know, so we could send that to them, we could make everybody aware but then again I’m sure there’d be issues, of what you do if it's 74% probability.

DEU10: A lot of the issues could be improved upon, if there was some sort of framework or principles written down. A question I’ve been asked again is how you equate probability of presence with density. People will ask you have to try to use for their own benefit is if you've got 95% probability of Curlew being present well, it could only be one pair you know won't pay is not a nationally significant number. But if it was you know it, and again and talking to various other people that know far more about an idea is that there will be some mathematical correlation between ability and density. So even if there was something that 95% probability means these likely that there are going to be more one or more pairs and it could be an important area even something like that. You can almost come up with like a flow chart or matrix that everybody's working to. If you're a Curlew project officer you could say well you know, even if there's 25% chance to be there could still be there and we could manage it. I think there's something missing in that sort of end product. And that was the sort of thing that could help on a day to day basis when we interpret the data so not only is you know presence or absence at the moment it is the bulk of the stuff is somebody physically going out survey that is over there is so you know you make a decision on that, but and like I say it's not quite as easy with probability.

DEU10: So.

INT: That will be useful.

INT: that's printed and [Name] was there anything else that you want to.

INT: Talk about oh.

EU10: No, I think you've been sort of questions were sort of.

DEU10: covered the sort of points I was visiting read each other.