DEU12: So [government agency] are the [Country] regulator on [land use] activity in [Country], so we cover everything from [land use] creation through to felling permissions and the management of existing [land use] areas. And to guide all of that, there is a standard called the UK [land use] standard it's been in existence for quite a number of years. It has different sections one of the sections is on biodiversity and that's my responsibility in [Country] is to ensure that the information in that is up to date that there's compliance through the sector in the guidance that's provided in that so it's a technical document, it’s a guidance document policy itself on [land use] comes from [Country] government now, and this is all so very different compared to the way things were previously. [land use] is now a fully devolved activity to [Country] ministers and we've just passed our one-year anniversary so we're all still getting embedded into the new system. And we have a new [land use] act that guides us as well. So my activities my day to day work covers everything from providing advice to the [land use] sector on compliance with legislation to developing guidance internally, but also to working with others [Country] colleague guidance to provide advice to ministers and senior citizens or others within the sectors.

INT: How many people do you work with, is it a small team?

DEU12: So, our sustainable [land use] management team is, well, our team leader has literally just gone on maternity leave two days ago. But normally there are five of us that work on this and we all have responsibility for different things, but [government agency]is broadly split into two there’s the national team which usually work out of the office and [place] and they are responsible for compliance, etc, and then there's the operational delivery team so that's the conservancy's that deal with the actual landowners and agents out in different parts of [Country]. I don't know what the total staff compliment is, I think it's somewhere around at 80 or so that that work in the conservancy's maybe slightly more than that and it'll be less than that about 40 or 50 that work in national office. But it changes, it fluctuates regularly.

INT: You talk about the guidance document or technical document; how often do you produce that?

DEU12: It's been reviewed or about to go through review now, so it tends to be every four or five years it gets updated. It's a UK document so there's a process that requires clarification and agreement with Wales and England. But it guides this sector through the development and delivery of sustainable [land use] management and that's the principle, under which we expect everybody to be managing or creating new [land use] and it's an important concept, particularly for [Country] because anything that the sector through which we expect it to be sustainable and compliant with all the other bits of legislation that didn't putting a lot of the environmental legislation, although we're not necessarily responsible for some of that such as the wildlife and countryside act, or the wildlife and natural environment [Country] act it's embedded into the UK FS. It's signposted a lot of the legislation that we expect people to follow and it is important because sustainable [land use] management's about delivering now and in the future and enhancing on protecting habitats and species, where we can. I mean there are differences, then between England and in [Country] and that gets translated from the UK FS which gives us an umbrella document. For all of our guidance it gets nuanced when you come down to country level.

INT: That's great. I’ll now move on to the premise of the interview, so firstly looking at purposes for using species records data and what species record data do you use and is this individual species or groups of species and then also in terms of the spatial extent as well as.

DEU12: Both and everything. It depends on the circumstances; and it depends on the species group, so I'll give a couple of examples. At one extent or one part of it a landowner will decide that they want to put a new [land use] creation scheme together, they want to plant trees on their ground me on the size of that. If it’s over 0.25 of a hectare, it's then got to comply with the regulations that we have in place in the UK FS guide. So, it may well come under an EIA determination, but normally prior to that there is an expectation that the landowners will put together a plan, a scheme, and they will go through a process of mitigating for any impact they might have on any protected species or habitat present so for their individual footprint, they need to undergo a process of due diligence, demonstrate to us that they're not impacting on species. So that could be anything, it could be ants, annex 1 habitats, it could be golden eagles which have a huge range of habitat. Some of the individual species that crop up regularly at the moment or things like Curlews, nesting Curlews, ground nesting birds, Waiders are very important and we expect the presence of those to be mapped for us to use that. But I also work at the other end of that I also worked more to the landscape scale with schedule one birds. And by schedule 1 so white tailed eagles, golden eagles that sort of thing and for the golden eagles one we're working on guidance, which is based on modelling work in produced by satellite tag tracking data and that helps us at the landscape scale to determine where the important habitat is and again that then informs the process we expect landowners to take account of this information. We don't collect the data ourselves there's a difference here, it’s quite a subtle but very important difference between [Country] and [Country], so the [Country] [land use] scheme, they pay for the collection of that data as evidence and they then own that, but we don't we expect the owners to undertake that process that collection of information. We do try and work with our record centres with some of the bigger organizations like Butterfly conservation and make available the records that they have, and in fact earlier this week, I was working with butterfly conservation [Country] to look at the next process that we're going to undertake which is protecting priority species in [Country] through the publication of online maps so we've worked for two particular species and [Country], northern brown argus and marsh fritillary to generate an electronic layer that will set on our information pages, so that when a manager and is considering planting in an area if they click on that particular area in what's called a land information search page, it will flag up that these species are present and in certain circumstances, we can see, you cannot plant because its a protected species, but in many circumstances we just make them aware that it's there, so we expect them to go through a different process of due diligence and we will check whether or not they are not. Anything that's got a protected status or anything that's identified on the [Country] biodiversity list, which again will need to be considered and we're often struggling to get up to date, relevant information it's always one of the biggest barriers to processing these schemes quickly is having confidence that there isn't something present that we wouldn't adversely impact on. And, of course, surveying every site is very expensive so it would be good to have data at the desktop.

INT: A couple of questions what you've just said. You talked about how you expect the landowners to collect the data, do they use a variety of methods to do that or is that just done on an individual level.

DEU12: Well, a couple of years ago we generated a new set of guidance documents to guide land managers through the process of putting together a scheme for planting and part of that is a supplemental document where we've identified a process that that would be recommended we can't tell them they have to do that, we can recommend a process that we've identified, first and foremost, that they should be doing JNCC walk over survey to determine whether or not there's something of importance there. Now quite a lot of the sites that come forward maybe ex-arable where there is improved grassland there's no biodiversity interest, there’s no cultural heritage interest, there's very little chance there being anything present that we would be protected so there's no point of doing a full bird survey, or a survey for everything else they walk it first and if they can prove from that that there's nothing of any interest on it then scheme will go ahead as it is. If, however, they come up across an area of important habitat corner that’s a bit wetter than something else, or an area of what we call end-bio land, which may be less managed it may have been under intermittent grazing we would expect them to then conduct more fuller surveys to determine whether or not there is something of interest present and we also get them to use things like the NBN gateway. And we encourage discussion with groups like RSPB, with local biodiversity groups, they should be checking things like the local biodiversity plan. And there's a lot of citizen science groups out there, like butterfly conservation, etc, so we try to encourage them to look at their pages as well, to see whether there's anything particular for that site. Sometimes that's quite difficult for new schemes planting schemes, we obviously also have a large area of [land use] that we're managing and we expect him to go through a similar process prior to any management activities in there. And they're probably better covered with survey information and we've got things like relationships with the [Country animal monitoring plan], we’ve got the [Country animal monitoring scheme]. Most of the active nests and breeding territories, for all the raptors are available in the database, or they can ask the raptor groups with this of information. And if there's a coupe that's about to be felled if there's something of interest in that coupe, be it red squirrels be it goshawks all that information is made available and the landowner needs to take that into account to do the planning. You know everything revolves around the ability to have up to date, reliable species data it's absolutely essential. Because one of the downfalls of [land use] here is that because we create such great habitat we get species moving in all the time, so there's always the presence of you know, protected species it's inevitable they're going to be there.

INT: You talk about the issues of having up to date data. Are there ways in which that can be improved?

DEU12: Yes, well, I mentioned in the email that I sent to your colleague, when she was setting this up talking about the SPF review, so the biodiversity atlas for living [Country] process created you know from the NBN and created this desire to have a much faster system that is much quicker at validating data and putting it through into a format that could then be used, so I'm a species volunteer for a couple of groups for vertebrates and lepidoptera’s so one of the things that's often the case is people collect information, it may be a protected species, they know it's important. But the amount of time it takes for that information to get from there onto a platform where somebody can access it can be years. I mean, there are some cases that people who have notebooks worth of 20, 30,40 years of data and they never release it until the point at which you know they either give up, retire or unfortunately pass away and this information is then made available so there's a block sometimes and a mental block, more than anything else in trying to communicate to people, the importance of making this information available so that's the first step to it. And the SPF review was going to or the SPF did identify a process which would speed that up and make the information, even if it was unvalidated information available much, much quicker to those end users who would benefit from it. With caveats added, obviously, but in general, most of the species information collected by volunteers and specialists is reasonably accurate. I mean there are sometimes errors that creep in but we've got good county recorders and irecord is a fantastic system for posting and backing data and the availability of camera phones and the ease with which people can take pretty good quality pictures these days and post them online for people to identify as his you know it's so much better than it used to so everything in terms of capturing that data has a sped up. The process of then making it available for others to use hasn't kept the pace and it's still slow and that needs to improve that's where the block for us, and I think some of the colleagues I work with that's where that is. The breeding bird survey data, for example, that we're using at the moment is 10 years old. And a lot can happen in 10 years. You get to a stage where you go well, we can't rely on it, we have to undertake a survey again just to check. We have the potential of making errors if we don't follow through and we don't want to do that.

INT: That's great. Thank you. So, you obtain your data from landholders. Is that the only place where you obtain data?

DEU12: yeah well sort of yes, because we are not a landowner ourselves. [government agency]a re just an agency, so we don't hold much in the way of data we have data, we do have our own data sets which are based on the national [land use] inventory, for example, which covers the private and the public [land use]s estates so that's surveyed on a regular basis, and we do have the native [land use] survey for [Country], which was conducted several years ago. But again, that data it only covers trees tree habitats and it's only was present, and it doesn't cover the important area species groups, so we don't own any data like that we don't make any collections of that. We’re reliant on other groups but we will work collaboratively and match fund where we're possible other groups. So, an example, this morning game and wildlife conservancy trust produce a report annually, which is based on the black grouse males that visit lex within particular black grouse areas here in [Country] so there's about, I can't remember how many black grouse groups that are there, 10 groups that cover fairly large geographical areas and each year volunteers go out and survey the number of males count the number of males that appear at these lex and that train data is used them to feed into things like our grant system, in conjunction with [wildlife charity] used to be called s and H. And to determine whether or not we should be providing grant protect black grouse habitat. We use that information of active lex to protect the lex from planting. But we also use whether or not the population at a regional scale so we've got [Country] basically just cut into two areas north and south. So, in the south, the populations declining we put more effort into supporting predator control and fence marking there then we do the north, where the populations quite stable, and this is still continuing to increase through. We do as much of that as we can we do with other species such as blacken frilly. We work closely with deer groups trying to reduce impact and [land use]. We work with [wildlife charity] on ground nesting wading species. We work with [wildlife charity] on protective invertebrates we work with [wildlife charity] on bugs and invertebrates. Just about every species group there will be a specialist group that we have some involvement in and we focus and we prioritize on those that are protected squirrels, badgers, House Marten. And, although we have an interest in all the others we can't do them all, that would be impossible, but we're trying to encourage collaboration and discussion with bigger groups to bring several of them together into one format, so that we can take account of a wider range as possible, now we might not be able to do a lot of focused activity for them, but at least we are aware of where they are and what they're doing. Another good example, bat roost in trees we've got this potential issue with kolara ash die back. And, in some cases there's going to be a need to be able to identify where bats are roosting in trees to make sure that the trees aren't felled. Without the proper licenses and permissions being in place. So the felling permissions are under our control, but the licensing process is under the control of [nature organisation]and we have to work collaboratively with them to make sure that we've got something in place that helps inform land owners to ensure that they are compliant and not breaking the law.

INT: You talk about the fact that you can't monitor every species. But do you have like, say, a five year plan in which you will try and monitor that species group or does it just depend on what's happening at the time.

DEU12: What's happening at the time. Most of that monitoring is undertaken by [nature organisation]. So, it's not our responsibility, that might not be the right word but it's not under our portfolio, if you like to monitor populations, we expect that information to be available and we'll just make use of it so there's very little survey work that we undertake directly, we will just capitalize on those groups or those individuals or other agencies that have done that work, we support the where we can, but we don't have a lot of money for that it tends to be very small amounts.

INT: And the data that you do collect is that raw data or has it been processed in any way, shape or form.

DEU12: Both the data that we collect is raw data that's processed and we use the outputs from it, but most of what we use it tends to be processed and validated so that we've got confidence with it. We do get landowners to collect information on that particular area, but we don't have access to it. The grant system is not designed to pay for the service, they have to pay for the service themselves if they want to access the grant, which means that we have no, we have no ability to say, we want a copy of your information, we want a copy of your data, it would be something that we would look at in the future would be nice to get that sort of information we’ll probably start doing that, with habitat level data from deer browsing impacts. Where we are trying to improve [land use] conditions by you know, supporting deer management and we will pay for the collection of information, such as the population data and the impact that they're having on [land use]s but we'll have that data we’ll collect ourselves but the other data we don't we don't tell them we don't collect, but we do the expectation is that they will put it into those data sources for other people to get access to so we would expect them to put it into the local record Centre or to the NBN but we can't we can't insist on it, which is a shame.

INT: And so, presumably just moving on to resolution of the data that depends on the land holder, or do you advise them for a particular resolution.

DEU12: No, it depends on the land holdings so some of the schemes that come forward are maybe less than 10 hectares in size quite small, and so the footprint of, that is, you know very localized. Some of the other bigger schemes are coming through they’re maybe up to 1000 actors 1500 actors are impacted with the open space and habitat and then adjacency see impact that you have as well, so that that's a much bigger consideration the may well be several schemes coming forward at the same time, and the same area and then there's obviously the cumulative impact of multiple schemes coming forward to be considered and in those cases, we might ask for an extension of the survey area with the immediate footprints. There are of course issues with landowners’ adjacent areas, it might not be the same landowner. But it shouldn't be too difficult to process to get all. The bigger the scheme, the bigger area that we cover and smaller the scheme, the smaller. Again, it's species dependent so some of the raptor species we'd expected to do vantage point surveys.

And raptors could well be nesting out with scheme but they float across and hunt within a particular area it might be up to 6-10 kilometers away from their normal habitat the breeding habitat. But we have to be aware of that that sort of impact so it's quite a range from small scale to very wide scale, landscape scale and it's the same for hydrological processes so it’s more important to understand some of the geological formations and some of how the water hydrology is connected through the landscape, so that we don't interrupt particular area by planting in the middle of an important network, the same is true for pollinators species that need habitat to move through the landscape, we need to take all that into account.

INT: I think you alluded to it briefly before. In terms of any processing or analysis of the data, do you produce any data visualizations of that?

DEU12: yeah.

INT: How do you do with data gaps in terms of the interpretation of data.

DEU12: And that's a good question it depends on the circumstances. It depends the type of data gap, that is if it's a data gap that's because of survey activity. Then we would probably ask for a survey to fill in the gap before we decided and that would depend on the species and the size and extent and such like that. If this was an important area where it was potentially an important species been impacted we may well ask for an environmental impact assessment, so there would be an expectation someone would go out and collect more data to fill in these gaps in some cases, the gaps can be filled by modelling so we encourage the use of predictive models based on habitat and land use. We're working through a number of those with some groups at broad scale and trying to identify where there may well be gaps in our knowledge of species presence, but again, a model is only as good as the data that goes in and, in some circumstances we may still insist that the owner of the land comes forward with our actual evidence base so if there is a gap if there's a gap in that there is no species data they may well have to go out and collect that data on our behalf. So, we tend not to ignore the gaps. But there’s not that many options for filling them in and that then becomes very expensive. There’s a balance, then between how much effort to go into filling the gap and what it's worth in terms of what we would get at the end of it. And that's a difficult balancing act that our operational staff have to tackle pretty much on a daily basis.

INT: Next question is about how you consider confidence accuracy and precision in data.

DEU12: I mean, obviously we like to be extraordinarily confident in the data that's coming forward, because if we're making a decision on an important piece of ground that has serious implications if we get to wrong on protected species. To the extent that we may well be encouraging a landowner to break the law the wildlife laws, we have to be extremely confident in the data is accuracy and we will insist that the level of confidence attributed to any data set is sufficiently high for us to be to be happy to use it. Precision I mean sometimes it doesn't need to be precise, and then you know there's quite a difference between precision and accuracy. They have to be able to be accurate to determine one species from another. But how precise they are and where they are located, is probably less important, depending on what it is, there are exceptions that are caveats. For the big caveat, so I would say, are things like let's use marbles as an example as a European protected species beavers European protected species, but they tend to stick to the water areas they don't move that far into the [land use] and knowing that beavers are present in the area is probably sufficient knowing that they're in that water way is fine, because there isn't a restriction on [land use] operations in terms of continuing to work close to a beaver dam or a den. Otters would be very different because we have to make sure we don't, or wild cat, we don't disturb the den site or resting it is so we have to know with some accuracy and precision exactly where those dens are we have to know where a line up period map is so that it is protected. So, there's quite a difference there, even with two EPS species intangible things so there's a number of bits of guidance, that we have out that that tries to help guide land managers or owners through that. And it's a horses for courses situation, and you know different species of different requirements under the legislation, so we will, we will ensure that the confidence, the accuracy and the precision of each of the bits of information or asking for is fit for purpose. For the bird species, they're all different so it's legal to fell certain nests when the birds aren’t occupying it. And for some raptor species, there are exceptions are minimal exceptions like white tailed eagles you can't fell their nests even if they're not occupying so. In that case, we need to know not only that they're in the area and have huge territories, but we need to precisely where that nest is that active nest, which tree it is in. And it's the same with things like red squirrels, we need to know exactly where that red squirrel tree is and that tree is protected at times. But on other times it's only enough to know that they're present somewhere.

INT: So, the case of precision is largely dependent on species

DEU12: Very much dependent on species and also very much dependent on the legislation and what the legislation requires us to do so it's a twofold process. And there's no point in putting a lot of time and money, trying to be very, very accurate if it's just presence and absence that's important.

INT: What kind of audiences, are you sharing your information, with other than land holders?

DEU12: Everyone from the [Poilitical leader] down to the general public, you know interested citizens, so our audiences are very, very wide and, of course, the data is then and the information is modified dependent on the audience so at one extreme but in one case, we might do, or we expect to do discussions with the Community before they put plans forward for particular activities of the planting a new area we expect a consultation so they'll come with maps showing the extent of what they're going to be doing and they'll be showing broadly, some of the species that are present, nice graphics and such like, and then you can go all the way up to we work with colleagues in [Country] Government, where we might be working with a minister, so we just need a sound bite you know no more than seven or eight words to convey the principal under which we're doing something. But in other cases when we're working with, I might be working with police [Country] or with [nature agency]t, then we're going into the detail in a huge amount of detail, so it may well be that we're looking at scientific publications or the process of scientific and peer review process that's being used so that we understand exactly, going back to confidence, what it is that we're talking about so at one end some people don't need to know all of that, they just need to know the broad message. Whereas other audiences is very, very different and it depends the context we're using it for so if we're trying to create a new policy or we're trying to influence policy change, then the more information we need the more we need to validate what we've gone, the more we need to back that up with good scientific data, but if it's general infographics we produce a biodiversity report every three years under the biodiversity reporting process or Scotch commitment and there is a headline figure, you know we would support 28 EPS species, for example, that's all that's needed. It's very, very broad circumstances.

INT: So, talking about your data aspirations, how could the data that you use or collect be improved to help your decision making?

DEU12: faster. The big one is the speed at which it comes through the process.

INT: Of course.

DEU12: The accuracy of it is important to give us confidence, but I think if we are relatively confident that the data is up to date and somebody has at least something, when we're talking somebody we're talking about qualified ecologist potentially or preferably a qualified ecologist that is within that species group or a validated set of records from a citizen science group with volunteers, we know the volunteers are more than competent those two sorts of groupings, we would expect the records to be through much, much quicker to allow us to use that. Where there's potential for doubt in accuracy and unreliable information, then we would expect it to be, you know validated and processed that we would expect it to take slightly longer come through. But having information quicker is probably the most important thing for us. You know data that extremely accurate is still no data that's not helpful yeah. But it’s avoiding that issue of it comes back to that lack of evidence is not evidence of a lack you know, we need to be confident that if there's no information on a species, there is because it's not present rather than there's not been any survey activity. And [Country]’s a huge area and, some parts of it are not very well populated with people who are prepared to go to collect this information so that are very, very large gaps in our knowledge base. And those areas tend to be fairly attractive to [land use] owners wanting to put new [land use] in so we're constantly trying to catch up thing where most of the information that we're happy to use is based it's centred around the centres of populaces. Where we know people run moth traps and are involved in bird recording schemes things, but those are the areas where there's not a lot of [land use] activity. But that information is of even less relevance to us, but it does help drive and I suppose, this is where the differences, it does help also drive, then the national trend. And, particularly where we're concerned with things like the biodiversity crisis and the climate change emergency, we're looking at the impacts across populations of these changes where we see net loss and net gain in [Country] and happening at quite a rapid rate. So, having an idea of the broad population and the direction of broad population and going is very, very important as well. And that comes from the biggest citizen science projects from England, because they tend to have the impacts showing an effect before we start to see there's a lag of several years before the same impact in the south is then demonstrated here in the north, we have a bit of time to prepare. And having more of those long-term trends, I think, would be exceptionally helpful as well, to give us the ability to do strategic planning for resilience and adaptation work. We could start to plan ahead much faster than we currently do.

INT: And I’m going to move on to modelled data out, just like the final section and you've alluded to it before I think talking about modelling data in terms of habitat and land use. Are you a fan of modelled data then?

DEU12: Yes, absolutely. I spent 20 odd years and [Government Agency] before I came into this position we used to use modelling regularly. Models are only as good as the information that goes in and the way in which the models constructed and how its interpreted, obviously, but where you have good information for maybe only a proportion of the habitat, but you need it for elsewhere modelling is an excellent way of filling in the gaps or providing some sort of indication of how things trends, for example, might go against climate change, for example, population dynamics, species envelopes, all of this information is absolutely vital and it helps us plan so we use a lot of that in the development of our guidance and the development of our thinking in terms of policy it's not always forward facing it's not something that the general public, or the landowners get to see. So we're using more of that technique, with some of the habitat and species groups so that we can start to either fill in the gaps in the areas like I said, you know that lack of data is quite worrying in some respects, but we can at least infer where things should be. And we have found good success with our species groups where it has demonstrated quite clearly that the lack of a species being present in an area, recorded in an area it's not because it's not suitable for it is simply that the effort into looking for it hasn't been particularly high or you know people just haven't put any time and effort into it. So, the modelling work has been very, very useful in that respect, and I think the more that we have of that to help us run what if scenarios is very helpful then for looking at some of the implications of the decisions we might make. One of the species models that [land use] research have developed and that we use quite a bit is called niches for species. So it's based on the concept that native [land use] is composed of a number of niches and each of those niches are particularly populated by species that are on our biodiversity list that we're supposed to be protecting session, but the model can be run for what if scenarios, to look at the difference in [land use] and what type of [land use] to put in, so we have this ambitious target for [Country] Government to plant 18,000 hectares of new [land use] and, within that there is this expectation that will between three and 5000 actors at least have native [land use] created. So we can use the model to determine where the best places would be to focus that [land use], along with other outputs from groups like the wren project and certainly university, [land use] research, so we can start to identify where you know habitat network connectivity would best be supported, but we could then work that back from the model to the grant processes that we use to support through positive incentives. To get this output that we’re looking for, but again it's dependent on how good the data model is.

INT: So, I’m going to show you some examples of modelled data and you'll probably understand them pretty well giving your interest and background. So I’m, just going to share my screen now. How's that, can you see that. So, this is for a six month. So you've got a raw probability distribution on the left and then you've got a variation model on the right at a national scale. Firstly, are you able to interpret these and, secondly, do you find them useful. We'll start with the raw probability one first.

DEU12: Yes.

DEU12: Yes, I can interpret it.

INT: And is it helpful?

DEU12: Both together, yes.

DEU12: Okay, never seen it presented like that it tends to be a distribution model that we get and I find that that having a probability of distribution, but then also having variation added to it is helpful. In terms of statistical reliability that's something we often look for but we never always get.

INT: Well I’ll just give you a little bit more background about the models based on what the modellers have done. So the raw probability, one on the left it uses 21 land cover variables and 19 climatic variables, along with an understanding of the conditions in which particular species is found, and the available literature. To set the probability of finding the species in a particular location. So, most of the variables are at a scale of 100 meters. And the one on the right, the variation one so this is calculated using a sample of the background data to give a range and the predicted probability, so this model was run 10 times on 10 different data samples which include some points where there are target species records and some where there are records other species, but not the target species. So that was just a bit more information about those and I’ll just scroll down to the but just go down to the bottom. So, these are again the same as the raw probability on the left and the variation on the right, but these are around five-kilometre points of [place] and Oxfordshire. Again, I mean similar question, do you find this useful, and can you interpret them.

DEU12: yes and yes. Yes, we're using something similar in some pilot [land use] planning at the moment, with [government agency]Council slightly different we don't have the variation, but we do have the distribution of particular just species. They are very helpful maps very, very useful. I mean, these are ideal for us to use this as a sort of thing with I’m trying to get some of the other groups to have because this is a sort of thing that when you put it in front of an owner who's thinking of doing some work, you can very quickly say well look your bit of land is there, there is a really high probability you have that species, we don't have a record of it you're going to have to prove to me that it's not present or otherwise we're not going to approve your scheme and it says very early on, sets an expectation for people of what it is they need to do, and for us that's a very important principle because sometimes managers come forward thinking that they're just going to get handed money to plant.

DEU12: No, no, not at all.

INT: I would just ask, is there any additional information that you would include on these maps that you would find useful.

DEU12: It depends what it's been used for. I mean obviously the probability distribution is very useful for guiding planning and doing a strategic work, because it gives us an idea where something might be present and how important that habitat might be. What's obviously always useful, then, is to have an overlay of where it is actually being present so you know actual presence data as well. I mean I understand this properly embedded in the data is being used to generate these but not everybody viewing them, we might have the same understanding, so perhaps another map or another group that says, and this is where it is actually located at present.

INT: Okay yeah that's great.

INT: Have you got any other further comments on these?

DEU12: No.

DEU12: we could use these for a number of species.

INT: That's great so I’ll just stop sharing my screen now. So, I’ve covered all the questions that I intended to ask which is brilliant was there anything else that you wanted to tell me that perhaps you think I should ask or forgotten to ask.

DEU12: No, I think that's probably covered everything, I mean I didn't know much about the project before I got the invitation for this. So I have not had a chance to do too much delving into but it looks extremely useful, I must admit. Those sets of maps at the end there, particularly if that's the end product, for a number of species that are present in [Country] I mean we're not interested in the whole of the UK per se and there are some species that are on the specific for England, which is fine, but if there are those that are generated for [Country] as well, that offer those are the sorts of things I would bite your hand off to get access to. The other sort of thing that we're currently trying to produce for some species, so I have just mentally taken a note to speak to, and I was speaking to said butterfly conservation. Just this week about doing some additional layers and that that distribution map that you had these exactly what is it we're trying to produce for certain of the lepidopteran species they've just lost their GIS specialist so I might be suggesting to them that they contact you. If you’re not speaking to anyone from BC and as part of this interview process, I might get them to just drop you a line. They will be interested in the process that you've gone through to produce that probability map or they've just done it for marsh fritillary, but only for argyle. And we want to do it for other species, but I’m doing something similar with [bird charity] on Grand National waders we’re doing something similar with golden eagles in parts of [Country]. And the more of these species groups or individuals that we can cover and the more consistent, people are in the way they sound and the more confidence we have, and then the better. So that's been really, really useful it’s been really helpful. I hope it's successful. Yes, very, very, very useful for us.

INT: that's great.

DEU12: yeah excellent.

INT: I would just ask just one more question quickly and. So the next stage of the project would involve working with people like yourself and to co design data visualizations. Would this be something you'd be willing to get involved with at all.

DEU12: Having seen your outputs, yes, definitely because it's very much in line with what I had in the back of my mind is we needed it was missing, so it looks as if you're actually fulfilling something that we've wanted for some time. And I can help create a product of use to the end users, then, then yes I’d be more than happy to be involved in that any way I can.

INT: that's great but that's brilliant.

INT: Well it's been very interesting speaking to DEU12. Thanks for taking you time to speak to me.

DEU12: That’s great yes, the end of the day, for me, I start early and I finish it 3:30. This done is going on here there's still that windy but we're going to go for a walk go for a walk now.

INT: Definitely yeah gotta get out.

DEU12: You want to get a good a good assumption shoot at some point.

INT: Absolutely that's brilliant well enjoy your work later.

DEU12: Thank you very much, have everything to you.

INT: You too okay.