INT: I'm not sure whether it gives you a little pop up to tick? It might do.

DEU07: No, nothing to tick. I'm joining your consenting

INT: Right? OK, so I think you’ve all seen the questions before, so you kind of know what's coming. This may possibly take a little bit longer because there are three of you and we might need to go around you in order to cover the ground. But the first section is around your background and what you do in your jobs. The second bit is about is around your purposes for using species records data. Third bit is around your data requirements. The next bits around data communication and how we use that data. Next sections are on data aspirations and what you might like to have in terms of data in the future and then the last section is around modelled data and how that might change things for you. So, can I start by asking each of you the name of the organization that you work for or affiliated with and if that's more than one then it’s useful to know that too and what your role is within that organization. Should we start with DEU07?

DEU07: I’m a Biodiversity Officer at [city] Council, no other organisations or affiliation? Do you want me to expand on the role or just the title?

INT: If you expand on the role a little bit that would be helpful.

DEU07: So increasingly partnership work looking at landscape scale, nature conservation, restoration, and nature recovery networks. That type of thing, but in the past, it's been quite heavily involved with local sites in the management of the local site system in [city], so a little bit of a mixture of all those things still and more.

INT: And what about you, DEU08?

DEU08: I’m an ecologist planner again at [city] Council and no other organisations. So, my role is mainly as a planning consultee looking at planning applications and what the ecological impacts of those would be. At the moment I'm doing a slightly different role looking at biodiversity net gain and transacting to implementing biodiversity net gain system within the planning service.

INT: Interesting OK, what about you DEU09?

DEU09: Well I'm the biological records Officer for [city council], I run the local record centre. I also record coleopteran for the [wildlife organisation] for [Vice County numbers]. Our main data handling task is to respond to data search inquiries for various organisations.

INT: OK and can you explain a little bit about how the data centre sits with the Council? Because I think it's a slightly unusual model.

DEU09: Well we’re part of the planning section.

INT: So you sit entirely within the Council then?

DEU09: Yes. There are other LRCS that are the same within local authorities, but I think probably the majority are independent organizations.

DEU07: We work, just to sort of add on, with Yorkshire Ecological Data Network across South Yorkshire and Yorkshire more widely. So, it's not a formal arrangement but of partnership arrangement, in which we will work together in certain areas, share information, give each other support. DEU09 works entirely with the planning Department in terms of his role.

INT: The next bit is around your purposes for using species records data. Could you tell me about what species record data you use? And whether it's specific species or whether it's species groups and what the kind of spatial extent of that data uses.

DEU07: So, from a local sites point of view, we collect our own species data as well as using the stuff that's been provided to the record centre for many years. So the assessment that we make about local site identification Assessment, and designation is largely based on botanical records over many years and some criteria that we use also look at other species, but we’re relying less and less upon those and largely using the botanical information that we've collected in the past. And so we've we generally identified an assemblage that maybe solves 20-30 species on there that are characteristic of locally distinct habitat types, and that's one way that we identify and designate local wildlife sites.

INT: Is that the primary use of that data then? Is about designation or is it about other things as well?

DEU07: It would also inform management, but we've done less work in working with landowners to advise management, so they have discussed in the last 12 months, but it's been more than 12 months now. We've not met as a partnership recently, that we want to review the way that we've been re surveying sites and how we surveyed them in the future. We might do less of that, or something more targeted rather than just repeating the same surveys with a greater focus on using that information to advise managers because we've got very limited capacity and we just limited capacity we had will be better being more targeted and focusing on the management trying get this at the sites and to better management. Also with the, not the advent of net gain, but we want to look at those sites as potential receptors to receive management or support with management as well.

INT: Could I ask the same questions to you then DEU08?

DEU08: From a sort of planning consultee point of view, I would usually I sort of almost get the data second hand in the species data and it will come in with the consultant’s ecology report on a site. Then I'll be, you know, using their report and their findings of the data that they've got from DEU09 essentially from the records research. And that would sort of inform planning decisions, what surveys might be needed, if it's an initial assessment, what further servers you might need. That's one way would use species data. Other ways there’s the great crested newt district level licensing. We've used species data obviously just for great Crested newt for that project moving forward and that still sort of in its development. I think Natural England are working on that and we're about to have removed from that process at the moment. And then I guess in terms of other things that I would use, separate to planning applications, we do you get information may be about things that are happening that shouldn't be happening like enforcement type issues, and I guess that's when I maybe would go to DEU09 and say what records have we got in this area for? You know newts or whatever species, and I'd ask DEU09 for species records to deal with particular enforcement issues that come up.

INT: OK, so I’ve got a couple of follow up questions to that. So, the first one is when you are talking about consultants. Are they consultants who are acting on your behalf or are they consultants so acting on behalf of the planning application?

DEU08: They will be acting on acting on behalf of the planning applicants so the planning applicant would have to commission an ecology survey and part of that would have to include a record center search, so sometimes we do get ecology surveys that aren't informed by a record center search and we send them back and say please redo this and include the search from the records centre. It should inform their thinking within the report as well as just getting the data, they need to look at that data and evaluate it within their report and we look for evidence that they've done that.

INT: OK. And you were talking about net gain. So, is that something that you are currently using records for? Or are you thinking about how you might use those records for it.

DEU08: I was thinking about this earlier and I haven't really been using species records for biodiversity net gain. I think it might come in. I'm trying to think of ways it could come in as we're sort of maybe identifying sites where we think we could maybe deliver like a habitat bank. Species data might be used to inform that. We could use species data today to try and inform condition assessments or of sites to some extent you know what? How diverse is this habitat? Is it this grassland? What condition assessment does it fall within? But that would probably more likely be based on a survey that we commissioned or under took, then this then records that were sitting in the record center, so to speak. So at the moment I don't think we are using species that are very much for biodiversity net gain, but that may it's still in its infancy, so that may change I guess.

INT: OK, so those are there things which are not so much kind of raw data, but it might be data products that you would use?

DEU08: What do you mean by a data product like Tickler?

INT: things like indexes

DEU08: For the biodiversity net gain, it’s all based on UK habs survey data, so survey data provided in that format is would be useful OK? Species data isn't playing a huge role in that yet.

DEU07: It feels like it's almost supplementary. So if we're looking at a receptor site, for example, getting a baseline, But then we knew that they had a lot of potential for any or an existing population of something or opportunity to connect populations, then it would almost be.. Well, at the moment at least I think the consideration will be supplementary to the baseline assessment.

INT: Great, and what about you, DEU09?

DEU09: Right, well, this is regarding the data that we collect, basically it's anything and everything within the our recording area which is put onto our database. We get data from fieldworkers. Other sources such as Yorkshire Wildlife Trust. [unclear], I record and the main thing is to keep the database up to date. Using data from those sources.

INT: I'm wondering about whether the follow up question to that is about the the decisions that that data might inform.

DEU09: We might like. We get requests from consultants on behalf of planning applicants, we’ll get requests from consultants who are doing desktop surveys on on sites. Then we respond with the data that they requested. Maps and report.

INT: So that your primary audience? Or, do you have other primary audiences?

DEU09: Ecological consultants I'd say but we do respond to requests from members of the public and other organizations for doing private research?

DEU07: I think with the data that DEU09 uses the decision sections almost filtered by the work that DEU08 and myself do. So, for example, there's a straight sharing of data from DEU09 to the ecological consultants for whatever decision-making for whatever purpose they need it for, but with respect to the local sites partnership using that data from the record center, that kind of comes through me and we'll have a partnership discussion meeting about what that information means, or similarly from a planning consideration or decision point of view, the planning case offices will speak to DEU08 about what that information means, so we kind of work together in that respect.

INT: Yeah, that sounds good. OK, so the next bit is around data requirements. Where you obtain data from?

DEU07: This is probably going step on people’s toes here. Some of the data that we collect in particular for local wildlife sites we commission ourselves. We've been doing that for 10 years, but this is the point now, as discussed, where we want to perhaps reconsider how we do that to make it much more targeted and put a greater emphasis on using the information to maintain what's needed to maintain the designation and to think about managing the site itself for the best biodiversity condition if you like. Some of it is collected ourselves or commissioned. DEU09 will obviously comment on how some of its volunteers from various sources and DEU08 comment on how that comes from license returns from the GCN point of view. One thing that we've tried, one thing that we've considered at the moment, I don't want to go off topic, so stop me if I do. Is trying to collect information for members of the public about indicator species used in apps or other means events BioBlitz type stuff especially on verges and I mean to green spaces that where perhaps suddenly starting to manage in a different way, but we've not really, properly embarked upon that yet. That's very much something that were discussing at the moment.

INT: So I'm guessing that's all raw data?

DEU07: Yeah

Does the resolution of that data vary?

DEU09: Yes.

INT: I guess it's varying from the different sources. Is that problematic in any way, or is that something that you have ways of handling?

DEU09: If we get the results from a from a decent field worker we will get records to 8 figure resolution. We occasionally get stuff with just two figures is 10 KM records, which aren’t very much use to anybody, obviously. But yeah, I do try to encourage people to supply data the you know the highest resolution that they can.

DEU07: I'm just going to add DEU09 that you will go back to the data provider and sort of ask for any information that's missing as well. So yeah, we do sort of try to validate information that's perhaps not as if we want it to be.

DEU09: If I get a record, I would like to see at least a 6 figure reference to it for the accuracy of the record

INT: And so, beyond that, what other sort of processing or analysis might you do with the data

DEU09: I can only handle stuff with the resolution with which it's applied. I can go back to the source and ask for more detail. Does that answer your question?

INT: Yes, I think so. I guess I have a slightly regards processing.

DEU09: Do you mean validation verification? I mean, if I get a list of plants say I consider where it's come from and then consider that the records are reliable or not as the case may be. I mean that's an important part of entering the data to make sure you hand and verified.

INT: so those kind of quest ions around confidence and accuracy and precision are they mainly based on your knowledge of the recorder and the form the data is coming in or are there other things which

DEU09: Well it's mainly so you know the reliability of the source which is the first thing I usually consider.

DEU08: If you got something that was particularly unusual, does that flag?

DEU09: I will ask for some kind of verification photographs or specialims or?

DEU09: Like I say, it depends what the source is. If it's somebody that we know that's a reliable botanist, for example, or Hyponotrist, I probably got no further. I accept this stuff in good faith and it goes into the database. I mean, I do query stuff from time to time, but people send me especially sources such as I record I mean there is a bit of rubbish on I record. You have to be a bit careful.

INT: DEU07, I was thinking about you saying you did quite a lot of your own data collection on specific sites, so does that mean that there's a big imbalance between the data that's available for those sites and data that's available for their surroundings?

DEU07: Absolutely so we’ve only really focused on local wildlife sites in the past, because we're based within planning. We're trying to support that evidence based on that decision-making process and obviously their core sites as well, so that's been our focus in the past. The work that we've done outside of that is really quite limited in terms of data collection. We had a project in the [place] a few years ago where we worked with some consultants to develop a survey in technique for verges and [species] and [species] I think, and then they will also look at grassland condition assessment based on the SSSI 1. It’s due to capacity of the reasons it's been quite, I don't think that's really gone anywhere to be honest, but it's something that we're looking again now with a view to this current interest in trying to get communities involved in what's happening with their green spaces and wildlife that they might be able to record on their verges. So it's something that I think we will re visit as part of our work with the local authority rather than it just being a product of their project that's now come to an end. So I'd like to think we can use that. I couldn’t tell you what proportion of records we get from members of the public, I would have thought it would be very small. To be honest. I mean most of the work that we've commissioned in the past and from our consultant who's pulled in the local sites information, that makes up a good chunk of information. We've got regular recording organisations that DEU09's got agreements with where information is shared, but I think the percentage from the general public is probably quite small. Is that fair? DEU09, do you think?

DEU09: I think so. Yeah, we’ve got a very small percentage of stuff from the public. Now I've started looking at I record data. That percentage will probably rise.

DEU07: The other thing that we wanted to use is they turn planning applications because an awful lot of information that comes in is not stuff that's just regurgitated from the LRC, but actual data and we're trying to wrangle with the complexities of being able to access that data for this specific purpose of putting it into the records centre and to be able to use it, which is proving to be quite complicated to be honest, but we're still pressing ahead trying to work our way through that because we do recognize that there's an awful lot of information in there from ecological consultants so you know it will need possibly a different type of validation of everything verification, maybe because they're not necessarily ones that we're familiar with, but at the same time they will be professional bodies. That's another consideration for us, once we get more information coming like that, but we have not really been that successful so far in making that almost an automated process where we can put in.

INT: I was thinking about the impact that might have on your ability to make decisions in terms of landscape level planning or thinking about landscape connectivity. Yeah, those kinds of more strategic things.

DEU07: I would say at the minute, the only way at the minute I've had experience of using species data like that and I think you could argue it probably isn't being used to so much at a landscape scale is for example in the [area partnership]. They've got an identified list of indicator species that they’re sort of working to promote conservation of include things like [rare bird species], Otter, and [rare bird species], and things like that. So when they've had projects in the past that I've looked at, are we going to do some habitat restoration operation here? They'll take that and their species records into account, but I'm not sure that there's sort of sufficient population data to actually do that properly. I think it's almost an informative and you look at the habitat surrounding the suitability and it's more of an imbalance decision, I think, rather than something that's very much supported by really good sound data set where you've got some repeated surveys or population data? Think we still struggle with population data because the survey effort issues like you said, it's not consistent across the borough, and it's not consistent across time as well so we've got those issues. We take them into account but I would say it's the decision-making that’s probably not as strong as it could be if there was other evidence there, that would be, it would make life easier. Like I say it's not there, to the best of my knowledge anyway.

INT: I think DEU08, probably the question to ask you in this section is around how you deal with issues around confidence and accuracy and precision. It's kind of come into the conversation already in terms of where the data is coming from and all that and that kind of thing, yeah?

DEU08: In terms of confidence in which data 'cause most of the data. So, what generally would happen with me is I'd be looking at a survey report provided by a consultant, and that would be informed by data search from the record center, but it would also be based on their site surveys. So they've collected their own data essentially and then would be looking at that. So, in terms of confidence it's difficult to know how good a surveyor somebody is who's gone out and visited the site, and sometimes you get amazing reports and sometimes you get much sort of more you're not sure about it, and I guess my general focus is probably more on a restricted subset of the protected species. So your budgers, bats etc and it potentially in GCN, I'd potentially do a site visit to sites and sometimes I'll disagree with what the surveyors said in the report and then we'll go back to them and we'll have that conversation and ask them to do further work.

INT: I think that does cover it, but so I guess that then makes you think about the same kind of questions that I was asking DEU07 as well. How would you then deal with that information of the context of the wider area? Is that something that actually comes into the decision or not? Are you just thinking about that site or are you thinking about it?

DEU08: That's a tricky one. I guess because you might have a site where you've maybe not got protected species so say they're not saying they're finding any evidence of Badgers but then you go out and you query that and we haven't got the data from just outside the site that there supposed to take into account the source surrounds and give a general idea and everything is any survey is a snapshot in time. It's what the surveyor sees on that one visit that they've done to the site potentially and the quality of the data you get varies depending on what the sort of application is. So if it's a small application will be one surveyor having visited one time, whereas if it's an EIA you might have reams of surveys you know composed from 12 months of surveyors visiting a site repeatedly and doing different surveys, so you probably got more confidence in that data. I think the work I do is probably really quite limited on a sort of it will look at habitats rather than particular species data. So, if there was an acid grassland area we would look at that as this sort of an entity rather than the specific species within it. Or if it's protected species, we might well sort of trying to extrapolate of what might be going on around, what the impact of this be for a wider network for that particular species, but it is quite narrow I guess in the focus of the way we look at it. We're not looking at the bigger picture. One of the things they will often do is not look at the species data, but look at an aerial view of the site and make an assessment on that if this happened here, what, how, what would that influence for species getting from A to point B across the site? So it's much more general, high level thinking than really informed by species records.

INT: That makes me ask another question which is about the way that species records are collected, and would it be so much more useful if they also included information on habitat. We're focusing at the moment on lepidoptera and Orthoptera, so if the record also contained information on the host plant.

DEU07: We’ve got this ability to say three specimens seen feeding on this sort Two specimens foraging on this but again we rarely get information in with that type of context setting in terms of habitat, but we are able to do that, and there is some information that I just don't know how much.

DEU08: I guess for particular points that can be really useful, so if you got Brandon Beetle feeding on lime trees and you've got lime trees on the site, then actually there are details, isn't it? I guess we in some ways we look at it pretty simplistically, unless there's particular highlighted species, so if there's been an invertebrate survey, for instance, most applications wouldn't include something like an invertebrate survey. If there had been then looking at that we tend to pull out one of the key points. Highlighting is the really important species here and then we'd look at what are their requirements and try and use that to inform what then happens on the development site? So yeah, this particular host plant, or that would come into consideration. That would probably be more on the really large applications where you've maybe got an EIA and they've done more or less that sort of level of survey information where you have got your bird surveys and your invertebrate surveys, and it's not just your much smaller planning applications which could in many ways could have as much impact on a smaller site.

INT: Do you have anything to add on to that before we move on?

DEU09: When I do receive data, it very rarely has any information on habitat or abundance or anything like that which is a shame. Invertebrate surveys seem to be minimal. We very rarely get any useful invertebrate data from sites. I think most consultants seem to be interested in the furry, cuddly things. They're interested in great crested newts, waterways, Badgers, and they're really important things at the bottom of the food chain they’re not interested in and show no interest in doing invertebrate surveys. Any invertebrate survey is needs to be carried over 12 months, not a wet afternoon in February which is what happens usually.

DEU08: I think that the at the end of the reason for that though is the where the protection lies and where the powers that we have to influencing come from it. That's a deeper problem than what the surveyors are doing on the site, they’re legally expected to look at Bats and Badgers and great crested newts. Then there’s less drive for us to demand that they look at invertebrates and things and it would be wonderful if we could.

INT: We should move on and the next bit is around data communication and what you actually do with the data once you have processed and interpreted it. What kind of forms are you then using that data are in? And are you using that information in different forms for different kinds of audiences?

DEU07: The intention with the local sites data collection was to then share that information with the land owners that had given us permission to go and survey the land and try and enthuse them with us to manage their sites when we can’t come up with any money. We've done that to a minimal extent, mainly because of capacity issues, but we very much recognized the need to present that information in a non-technical way. So in the past when we have done it, we haven't necessarily shared the species list an made with appended it with more than a written description of the habitat and why it's important and may be flagged up as some sort target notes in terms of species or particular features that are of interest. That's something that we could go a whole lot further with, but we just haven't been able to because of the sort of capacity issues in terms of the partnership working. A lot of that looking at the data we’ve got, looking at potential projects, habitat restoration, creation, things like that it's largely done as discussions in meetings.

INT: Are you sharing figures and tables and things like that?

DEU07: We will share with our conservation partners, figures and maps and we will discuss with them and they will work with them as well, often with their partnership where the Council's not the lead partner. So it will be the Wildlife Trust or somebody else, and often there the people working with land owners on our behalf, which is also fantastic. I think I've got so many reasons why that's really beneficial, so we'll share data with them from the record centre directly or it will get shared from the Record Centre and it'll get discussed in a steering group or project meeting and then they'll go and work with the land owner, so that's another way that it's used again, quite informally. I don't think they ever rework that data and present it in any sort of report I think it's more discussions on the site on the ground with that with that landowner. Anything that we might do in terms with our other parts of the Council, other service areas like Streetscene who do our grounds maintenance, things like that. We would share data with them but generally it's not on sites that they're interested in, so whereas a lot of our information on wildlife sites they’re interested in verges and green spaces, our records might be very, very minimal for those, so we tend to be talking theoretically about where good sites might be rather than data specifics or principles. They talk about principles of conservation for particular species that we know might be in the general area but again, not data specifics. It's more about messaging principles rather than detail. Again, if we report into sort of more senior leadership on things. Again, I don't think we've ever needed to present specific data. Again, it would be the sort of headline messages. So mainly local sites data that we've collected ourselves presented in a nontechnical format to conservation partners or the landowner.

DEU09: I was going to say I think the question was data communication and what we do with them. So we do with the data. That's the yeah question. Yeah yeah, basically there are seas. Collects data, verifies it, and then shares it with whoever asks for it basically. We supply consultants with data, we share data with other organizations, we've got various partners data exchange agreements with [Wildlife charity]. [Unclear], [environmental association].

DEU07: Through the YDN, also with people at Yorkshire Water.

DEU09: We've got formal agreements with [water service company], [infrastructure project] and [Environmental public body].

INT: OK, so are those agreements about providing data as and when it's needed? Or do you do anything like a quarterly report?

DEU09: We've got supply agreements with them, [water service company], [infrastructure project] and [Environmental public body] where we supply on a regular basis on a contractual basis, quarterly, six monthly.

DEU07: I think with Yorkshire Water they ask for local sites boundaries and information and then are there specific species subsets that they want DEU09?

DEU09: Yes they don't want just anything, they require invasive species list. Other protected notable lists but with [INFRASTRUCTURE PROJECT] we supply them with everything that we had for their area of interest every 12 months for three years in the case of [INFRASTRUCTURE PROJECT]. The terms of these agreements vary somewhat depending on what they want.

INT: OK, how about you DEU08?

DEU08: I guess the data that I would interpret that the main way I would use this is it will then go into sort of a consultation response that I produce going to the planning officer, which would inform their report for planning Committee or for the decision on the planning application. principles and maybe specific species, but you're not talking details data essentially

INT: I guess then there's probably another level of sifting in terms of what information gets passed on by the planning officer to the planning committee.

DEU08: I guess the sifting probably happens from me to the case officer mainly, so I would pick out the things within the surveys that I think they need to be aware of, if we think it's a minor impact, we won't go into specifics of species at all. We’ll maybe talk about habitats or particular areas of the site, or things like that, but more mitigation measures things that we want to see. Then what the case was intended to do is use that information within their report. They sometimes will cut and paste it or rephrase it.

INT: Great, so next it's about data aspirations and how the data that you use could be improved and help with your decision making. This might take a while.

DEU08: I suppose I'd like more data from different places. It's having a spread of data, isn't it across a geographical area, not just from hotspot sites would be good. The other thing where some things special where if somebody found something that they think is really important and it gets sent in you've got that sort of datapoint in time of where they're found it. Now repeated visits to that over time would be useful so that that stays relevant, that would be good. Because if we're looking at or a consultant is looking at a report and they’re saying, ‘Oh well, ten years ago they said there was XYZ and that was quite interesting, but there's been nothing since’. Of those sites that are really valuable or particular interest species, then if you've repeatedly had that, I guess that would be useful.

INT: It's an interesting kind of data cap, isn't it because you probably have records that date from whenever record stuff is being collected that still exists.

DEU08: Especially I guess when we're looking at data for sites that isn't necessarily or trying to be used to inform a decision data that's not on the site that's been specifically surveyed, but it is nearby if you see what I mean. Well, if you know that it was nearby ish 10 years ago and it it's better to know if that was there two years ago as well and you could see that progression. So, like a bat roost for instance if we knew there was bat roost in a building that was a really good bat roost and we know that was there 15 years ago. Well actually it would be more useful to know whether it's there as well now or more recently, so maybe that would be a key thing for like the particularly special things that were particularly interesting things or rare things. Not having just a snapshot in time, but having repeated visits.

INT: The other half of the project was working with data recorders and trying to develop nudges that would encourage recorders to fill data gaps so places where modelled data suggests that there's a high likelihood that species might be. Perhaps also quite high uncertainty, so there's a lot of variation in the data that the model generates, but we haven't really been thinking about that temporal issue of where you have an old record of something or whether that is still current would actually be potentially motivating for recorders if something interesting has been found, but quite a while ago.

DEU08: I mean there are some sites where we do get that like the [place], that's a group you know repeatedly go out year after year or regularly to survey those. So in some instances where we know there's something interesting that survey effort is repeated, and that's great. It can be a concern sometimes a consultant would dismiss it. You see it written all the time. There's a record of great crested newts, but it's 15 years old and therefore they're dismissing it and you're like, well now just because no one's been back there, not because they're not necessarily there anymore.

DEU07: I think it's a very good point DEU08. In our local site selection criteria. We had certain criteria that were based on species records and groupings. So, for example, Bats and reptiles and certain birds, and they're the ones that, over time we've kind of stopped using because I think that the criteria initially said a significant population, so we kind of got around that because we didn’t have the population data by saying, you know, we’ll take expert local advice, advice of local recorders and then data recorded in so many years out. So, for example, it might say two of the last five years that we've got sort of confirmed records and it just became really difficult to both run those assessments and have the reliability of information coming through.

DEU08: Here's an example, the great crested Newt Project at the district level licensing, one of the requirements to have a red zone which is considered the highest level of protection is having repeated survey data from something like the last, I can't remember how many years demonstrating that the survey is large, not just in one year that you surveyed it, but large across multiple years. We've got that nowhere in [city], so we've got records of having a large population of GCN there, but we can't demonstrate it's a red zone because we haven't got repeated surveys over a period of time to show that it's not just a one off.

DEU07: The same thing is happening at the minute in the [place].

where they're trying to extend the old, not extend. It's a new Dearne Valley SSSI designation, not necessarily impacting us but more heading out towards Barnsley and Rotherham. Again when they were trying to do the data collection and the collection of evidence to transport that they were stumbling every time. They weren’t collecting new data so they needed existing data collected in a certain format to a certain methodological standard an and again this the same consistency of information, which has been a limitation for them.

DEU08: It could extend, so DEU07 mentioned earlier, our local sites designation process generally relies on botanical information that we've collected but there's lots of species criteria for designating local wildlife sites as well for different species groups, and we, as a local authority, not able to go out and collect that data, but there's things like say reptiles for instance. I think one of the criteria was having reasonably good populations of three different species of reptile, on a site and I am certain that those exist in [city], but we just haven't got there. We haven't got the data to designate something as particular importance for reptiles, and yet there will be areas where itis particularly important for reptiles, but there will be areas and it's very hard for us to quantify that. From my point of view is trying to defend planning applications if I can demonstrate that something meets the criteria for being worthy of designated to local wildlife site because of particular species data, not necessarily the botanical stuff, but the other species, your birds and it meets the criteria for designation. That would be really useful.

DEU07: We're almost relying on those sites being already there but that doesn't inform their management or doesn't inform other things.

DEU08: It doesn't inform their loss and it doesn't inform their sort of loss and the threats to them as well. So, you've got a grassland that's a neutral grassland, but you don't actually know that it's actually really important for XYZ invertebrate because we haven't got that data. That would be because the developer can know the planning applicant and the consultant can say we'll recreate this something here or will offset that. But if you haven't got the data about the actual worth of the full data on the actual worth of something where it is, then that's quite hard. You can never expect to get that from the planning application through the planning application process it’s just too onerous. So I guess that would be my takeout would be if people know of specific sites that they think are particularly good for particular species that are of conservation concern to collect that data regularly in a way that we use it within planning.

INT: do you have a take on this as well, DEU09?

DEU09: Well, I think that the basic question was data aspirations, wasn't it? I mean, we've probably covered this before the last few questions probably included some of this, but we certainly want more data from consultants’ surveys, as DEU07 said with certain aspects of that we're struggling to get results from that. Another aspect is when we get data, we need them to have good resolution, more detail on habitat and abundance so that we can follow habitat development overtime is a habitat improving or deteriorating? This will be indicated by surveying over a number of years. One of the important things is that we keep the database up to date. Nobody wants records at 60 years old. They want up-to-date stuff, which means people have got to go out in the field and do the work. We need to monitor sites over a long period. I'd like to see more long-term surveying, like the local wildlife site surveys which we've got to find people to do it. We’ve got to find the money to pay them. Our local wildlife surveys seem to concentrate on botany whereas we would like to see other groups organism surveyed over a period of time. Otherwise I think DEU07 and DEU08 have made some good points.

INT: The next questions are about modelled data. Data which is derived from models or may also incorporate raw data but is mainly derived from models. So if you were able to obtain modelled data, either for single species or for assemblages of species or for indexes would that affect how you would interpret the data.

DEU07: We’re just getting into that the great crested newt modelling I think and say I don't think we've seen the full and final model yet. And we've always been very self-cautious and not necessarily critical but we want the models to be based on sound data in the 1st place it or you’re not sure how reliable they can be? I think if you had that certainty or you knew more about the information that had gone in then I think modelled data can possibly be very helpful, especially because in terms of communicating high level messages to people about things, it's a very easy way to sort of make some broad comments, but I think obviously you need to be confident in the data that's going to the models.

DEU08: I would like to use model data, but subject to really understanding being confident in what I can and can't use it for and what it what it reliably will tell me and what it what it isn't reliably telling you so I'm trying to think, for example, if you had, it would be quite useful. For instance, if you had a model showing where you might expect to find species X, or you know a Badger and you could use that as a risk that are to inform when you're asking for surveys potentially. That's a very simplistic example. I'm sure there are far better ones, but if you could use it to inform where you might need extra work or to get more detailed understanding on things. I think that could be potentially be useful, but it’s knowing what you can and can't rely on the model to tell you.

DEU09: I'd want to know what the model is based on really

INT: so I guess this is a gradient and most days between accuracy and completeness. I don't know whether you have an opinion about way you would want it fall on that kind of gradient.

DEU08: It depends what decision it was informing. If it's highly accurate and you don't need the extra survey. If it's less accurate it's informing the need for further survey does that make sense? So, it depends on the gradient between accuracy and it depends what you're using it for and where you want it to fall.

DEU07: Would we ever be in a position where we felt that something was entirely complete? I suspect not. I suppose what we're saying, is more about is more focused on the accuracy, so of knowing that the what's gone into our model is accurate rather than sound or did you mean completeness in terms of coverage and extent? Just feels like 1,000,000 miles away from that and I mean I don't know what it's like in other areas, but in terms of that sort of coverage and that spread of information coming from different parts of the landscape, it just feels like we're a long way away from that.

DEU09: If your model is based on accurate habitat data. Then you'd know what species you could expect.

INT: OK, so I have an example to share with you of modelled data which the team at CEH have developed. So, this is really intended to be a kind of starting point of the kind of output that the model could generate, so it's based on a single species which is the six spot Burnet moth. So, I'm just going to share my screen so that you can see that. Can you see my screen now? I'm just going to make this a bit bigger so it's easier for you to see. What this shows is on the left we've got the raw probability and there's a national scale and a five-kilometre scale around a point at the bottom in second and then on the right there's a measure of variation. So what the model uses is 21 landcover variables plus 19 climatic variables along with an understanding of the conditions that species is found in based on the available literature and the existing records, and that sets the probability that species will be found in a particular location. So, most of the variables that the model users are at the scale of 100 meters. On the right, we've got that at two different scales, so there's the national scale there and then it's on scale on the side is obviously between naught and one, so for this particular species then the top of that scale is 1. And then at a more local scale. So, we've got a point and radius of 5 kilometres centres in modern food and oxygen, where CEH is and then you can see the scale upside is slightly different because the maximum probability isn't one for this location, it's about 0.7. And then what we have on the right-hand side is this measure of variation. So, this is trying to deal with those questions around accuracy. So, the way that the variation is calculated is that it uses a sample of the background data to give a range in the predicted probability. So, it uses the data from sites where there are records of other lepidoptera but not this particular species, and it uses that to kind of predict the variation. So, in this case the model was run 10 times using 10 different data samples, so it's got you know that variation across those ten runs so. It gives the variation in those ten runs. So, then that data is also available at the more local scale, so you can see the variation there between zero and one as well. So, if you look at this area on the bottom right hand side, we've got this darker green area here, where the probability is quite high. But when you look at it on the variation, it’s variable how likely that prediction is.

DEU08: Sorry, is green on the righthand drawing where variability is low, or the pink where the variability is low.

INT: Pink is where the variability is lower.

DEU08: OK, so you're more confident in your result where it's pink.

INT: So the idea is that you could, and models are starting to do this now, is to combine those two things to identify sites where there is high probability but also high variation. So, there are areas where we would want to target surveying to try and refine the model. So, the questions around this are. How would you feel about interpreting this probability data that's shown in the image on the left?

DEU09: Sorry, will you repeat that question?

INT: How would how would you feel about interpreting that probability?

DEU09: How would I feel about interpreting it? Well it’s based on reliable records.

INT: So yeah, should have said that the records come from the NBN data.

DEU08: It would depend what I was interpreting it for. Well, in terms of the way I use data, it's very much planning, application driven, driven and either do you refuse or approve this planning application. I think I'd struggle to use a model to go to a planning inspector and say, well the modelled data suggests this. I think that they would be reluctant to accept that kind of information. I think they'd want hard records. They’d want to survey, so you'd have to back it up. Whether you could use it to then inform whether you should be doing a survey in the 1st place to then get that data, that's a different question.

DEU07: It feels like 1 tool that you would use rather than the thing that ultimately leads to a decision. So again, you could use it as a useful tool in terms of targeting where a survey should take place like you just mentioned for a planning application or for a planning decision, or where you might target a species survey for site designation or for project work. I think, especially at landscape scale, it offers something that we haven't otherwise got, but I think it's just one tool that you would use and in certain instances like planning where it's much more site focus, but you might look at the wider landscape context. Then there might be a greater reliance upon the raw data, whereas when we're looking at sort of strategic landscape scale delivery and modelling, and some of this natural capital mapping that we were looking at the moment, then you can see how something like this could really support key messages and areas of activity. That's a different type of decision. It's more of a movement in the direction of your work rather than a hard decision.

DEU08: I think it depends what question you're asking where you use it but for some of the sort of it's quite exciting, it's quite interesting. I love models.

DEU07: It's quite trusting that everything's got a colour. There's no white bits, so it feels complete, even though it's all about interpretation, is entirely about the interpretation. It has a sense of completeness, even though it's based on the same data, essentially is you've already access to, but it's presenting it within in a different context.

DEU08: It depends as well on what species is this modelled on? And then what can you need to understand what you can imply from that as well? That tells me a lot about one species, but not all the others.

INT: So, having this available for a single species is that actually useful at all? Or is it only useful when it's combined into an assemblage?

DEU08: I think it would be more useful combined into an assemblage.

DEU07: Yeah, I think so too.

DEU09: Yeah, I agree with that.

INT: So at the moment all this shows is the probability and the variation and obviously if you know the area around like that then maybe you can interpret that, but otherwise it's quite difficult to know what's where so are there additional layers that would really help you to interpret that information what would you need?

DEU08: So, this was this based on presumably landcover data of some sort.

DEU07: So, it's not necessarily what layers you would bring into the model.

INT: It's about how we can help you to interpret it.

DEU08: Dispersal. So, if we're thinking networks we're using it for something to do with looking at networks, you've got your, I don't know how you’d do it. How far will species go from A TO B can it get from here to there or is there just no way it's going to get from here to there because that's far too far for it to go.

DEU07: Is that already a component of the model?

INT: I’m not sure

DEU08: That was one of the things we looked at with because with climate change and things if things are going to need to move, that's quite a key. So one of our policy drivers is looking at ecological network sites but then ecological networks as well which is quite a sort of amorphous non defined term.

INT: So would it actually help to have the points of the records shown as well for that?

DEU07: Yes, I would say if it's possible without

DEU08: It could target, so if one of the things you were doing with this is looking and saying well where should we concentrate survey effort to confirm presence? If you know where your existing records are then you look at the green ones. Yeah, green areas and you send your surveyors to those that don't already have the dots I guess does that makes sense.

DEU09: Yeah, I think you'd need some indication of the loan records. You'd also need some indication of the habitat in which you'd expect to find this thing. And if you had areas of habitat with no dots. Species currents, dots on say you could home in those areas of habitat to see if it occurs there by field surveys.

INT: So, I would speculate that that area.

DEU09: I'm struggling a little bit to provide any useful sort of input to this one.

INT: So can you see this area here, which is much paler, right? Yeah, yeah, so you would expect that to be an area where there's no possible habitat. Yeah, that's a very built up area or something.

DEU09: Yeah, when I look at that I would expect that somebody is deciding that the habitat for this thing isn't there? If the habitat isn't there, then the species can't take advantage of it.

DEU07: One thing that we've shown before in terms of looking at some old Atlas work that we did, where we put a point on a map where something had been recorded, we also try to indicate the age of the record as well. So it would be possible to show like a historical record of a more current record terms of targeting.

DEU09: There's also the added complication that things fly around, it could have been recorded in an area where it shouldn't be, or the habitat that would normally associate with it isn't there. You know, that might confuse the issue a bit, I don't know.

INT: So we're getting towards the end of the questions and the final ones are really about whether there's anything else that you feel like you haven't said already. About this area that you would like to make sure we know.

DEU07: I don't know how it fits into the project, but it's not so much influence in our decision making sure certain models would help support our decision-making. I think it's more the impact of those decisions really. So, whether a model or some spatial representation helps us communicate what we're doing or helps us monitor impacts. I think that's something that's going to be increasingly important for us in terms of escalating what we're doing influencing decision-making. How we are reporting against our climate and biodiversity objectives exceeds we've declared an emergency. What are we going to do? And I think when you start thinking about models and surveys and thinking about how people can get involved in that and how we can monitor that engagement or monitor what that survey is, I don't really know exactly what I'm trying to communicate. I think monitoring of something is going to be very important person, whether it's monitoring to inform the decision or monitoring what we're doing with the view to in our other projects.

DEU08: Yeah, similar to sort of building on that, so you've got that sort of modelled map as a snapshot in time of now essentially and it would be good to be able to do it again in five years-time. If things have changed on the ground and you could show and then you can show that that has changed and that's under the situations better, hopefully or not worse.

INT: So it could potentially be useful for showing the potential impact of management.

DEU07: Impacting the decisions rather than informing the decision-making on the system, and again, it's about more, perhaps more, for communication and of those sorts of purposes, but I think whereas we’d absolutely agree that this of the spread so geographically, temporally of data and more data of everything is what we need. I think if you can identify some, I don't know other column flagship species are something that people can actually connect to hopefully not something too woolly or too fluffy DEU09, but actually repeat that exercise. I think that might help to engage people where they can do as an assemblage. I don't know if that's possible.

DEU08: Showing things, showing and improve it would be great, wouldn't it if you could demonstrate you know that, but things can now move from here to there and they weren't able to do before.

DEU07: Yeah, I was reading that study. It was about house sparrows in London Parks. It's probably quite an old but I still use it repeatedly when I'm trying to make certain points because it's so tangible. I think it seems to have quite a high success rate in engaging with local communities and actually influencing repeat surveys and management activities and work. So, I've been using that recently because of the specific piece of work I'm doing with our team and trying to look at how they're managing verges and things like that, but I think it can be a useful communication tool. Certainly, I know that's not exactly what it's been designed for. It's being designed for decision-making.

INT: It's really useful to think about what the model data could be used for, because ensuring that we can use it for as wide a range of purposes as possible and we need to think about what the considerations are at this stage, to make sure that we're not cutting off possibilities.

DEU07: Absolutely, and hopefully it will probably get a different response if you were interviewing the Wildlife Trust, but I think from Council POV just giving you an insight into what you know, the types of things we discussed. In terms of evidence and what really seems to not matter to people. But you know what really strikes a chord with people, and being able to monitor certain things, not necessarily species, but some of the impacts of our activities. It just took one final thing for me, so we doing this piece of work with the Wildlife Trust trying to set up this Doncaster Nature Alliance. It's a bit of an amorphous and grouping at the minute, but I think that will maybe take shape over next couple years so that we've got a better online presence for people and again that might support some of our community engagement and supporting and encouraging communities to go out record and collect data, it's going to be more of a ideally bit of a one stop shop for Doncaster about how they can get involved, what they can do, where they could do it, and that types of, but it's very much and it's an early day.

INT: So the final question is about the next stage of the project, which is a codesign process to try and ensure that these sort of outputs from the model are as useful as possible to wider range of users. So, it's just really ask whether you would potentially be interested in being involved in that.

DEU07: Yes

DEU08: I would definitely.

DEU09: Yeah

INT: Great thank you and so is there anything else that you want to ask me before we wrap up? No all good. Well thank you so much for your time, much appreciated. Enjoy your Easter Holidays.