INT: So firstly, just to start off with and could you just tell me a bit more about the organization you work for and your role within that.

DEU16: I work for an organization called [environmental charity], it's a charity and I’m the chief executive.

INT: And what does your daily role entail?

DEU16: Everything. We don't have any staff, everything is outsourced and there is a collection of functions based on getting our data preparation engagement, coordination with national data sets. Those are the main bits then funding, communication. Those are the main roles that we do.

INT: Great. So, what species record data do you use and this includes species groups or spatial extent.

DEU16: At the moment we've got national data sets for birds and we are in discussions producing similar data sets for three or four of the other taxonomic groups.

INT: And could you talk me through what you use that data for so does it inform any decisions at all.

DEU16: Yes, what we've done is, we have worked with the [bird charity] and we have taken their breeding bird survey that excludes everybody and just provides this miserable decline that has informed national policy but has excluded anyone from the process and what we did with that we went to them and proposed that we took the monitoring data and converted it into management data. So that landholders would be able to use the same methodology, so that they could calibrate their performance against national standards for the first time. And that they could create their own trend lines, so that they became aware of whether they were part of the problem or part of the solution and the system identifies success and will enable research in the future to calibrate what they are researching so that you're able to position change in the future. We have formal endorsements with the [BIRD CHARITY] formal agreement with that. We have formal agreement with the board of natural England endorsing the process and the breeding bird survey had four main land types that were assessed in there and we ran the rerun those land areas through the land cover map and that show to other broad habitat types being the built area and upland and heath land. And we went back to the [BIRD CHARITY] and we pointed out the fact there were six broad habitats in the UK, rather than four that they were covering and that, if in 1970 when they've been aware of that. They created indices for 4 of the habitat types, what would be the suite of species that were representative of the last two and so we now have a an index that calibrates the performance of the six broad habitats across the UK.

And that by looking at the, so that dealt with habitat types, but the question was then how to connect ecological data with people and by looking at the ecological recording or using the 10 square kilometres or 10 kilometres grid squares, we then create a program with the centre for ecology and hydrology. To create the LIFE map that allocates every town, city and parish into the 10 K grid squares, so that you can connect people with the information for their community and the life map and that we having got that we then went back to the [BIRD CHARITY], we suggested, taking all the data for the hundred and 30 species in the breeding bird index and extracting that at 10 k grid square level to show every Community the suite of species which they are individually and collectively responsible. So that is it's how you break these national data sets that nominally open data. But most of them aren't accessible if they are accessible, you can’t understand them. And if you really work hard, and you can understand them, you still can't use them. And so that was the principle of the life map making national data sets accessible, understandable and usable and that is what we have been doing.

INT: I had to look at those life maps and they’re very interesting, did you want to speak about them at all, a bit more, I mean I’ve got them here, and I can share the screen and you can explain them.

DEU16: The LIFE map uses the so you've got England you've got 44 counties across England and then within those counties you've got these 1407 grid squares and at that level, most people can relate that's home for them. The moment we get outside that then they're less interested. But by being able to use the 10 K grid squares you've suddenly got the opportunity to compare like with like so yeah they are interested in their world and not too interested in the ones next door until they there's an opportunity looking what next door are doing.

And so that that was hugely important and then for the presentation of data sets. Following on from those data sets and being able to provide them at the 10 K grid square level is that landholders can register their interest to show how land use sustains life. By using this format, as it gets they can register and protect their identity and location. Okay, which is hugely important, but it also means that when you're presenting data from any range of data source is that it gets over the problem of data protection, so that the people holding critical data can amass the data sets at the 10 K grid square level and then presented in the public domain. Because no information has been provided in a format that means anything to anybody. So, to create the life map seems so blindingly obvious but nobody's done it so everybody thinks it's really weird. So, the based program we're able to provide information for where people are based in their where their community is the parishes that are connected with it. We provide them with information about the natural character area that they're predominantly based in. So that as long as alongside the areas of outstanding natural beauty. There are actually 158 of these natural character areas that were enormous amount of work went into a nobody's ever bother to use and so there's the ability to. Look at the communities across the natural character areas which starts basically with geography and then the features associated with the six broad habitats, so you've got a starting point of the stuff about natural capital which there are a lot of people that are talking about that, but percentage wise it's a fraction of percent of the population that are deeply discussing it. None of the rest of the population has ever heard of it, and if they do, they will never understand it, because actually most of the people, discussing natural capital don't understand it either. This whole question of ecosystem services and things are just great but it's in the language that none of the rest of society will play a blind bit of notice about so that's whether our gift to the science world is that we're stupid. If we can translate what what's going on in science and research and put it in a usable format that society can understand, then we got a chance of making some progress.

INT: There needs to be something to bridge the gap between society and science.

DEU16: Yes and that's where this the LIFE map provides the connection from the starting points of knowledge at primary school and then develops through citizen science into national standards for reporting and then up into the higher levels of research and the top levels of knowledge so there is a method of actually connecting it and progressively building on it, rather than just creating all these little silos or, even worse, just reinventing the bloody wheel at a cost of half a million pounds every day I’m an agent stage where I’ve been frustrated about this for as long as you've been alive so you've got the ability to translate, present information to land holders for decision making. As you saw from one of the maps of the UK we've got funding for various counties across England and we've got half a million or 200 over 200,000 hectares registered at the moment and by the end of the should have reached 400,000 and that's approaching 4% of the area of England. And we expect to register over 10% of the total area of England. When registrations in a particular county REACH 10% to the area we start the Program. Offering similar engagement for elective members of national and local government that's going to be fascinating they're either all going to do it or none of them. And if none of them do it they're going to be named and shamed. And if they all do it then will we can start making some progress. So that becomes next stage, and then through that with enabled to reach the schools across the county and being able to provide each of the schools with their local him from Community information for use in the national curriculum. The Department of Education has tasked them with providing relevance in context to the curriculum without any resources or any method to deliver that so this system provides that free of charge to the education system and then it connects builds knowledge and understanding about the reporting methods and therefore trust in the national reporting systems and that, if we can do that then you've got an opportunity to continue the development of knowledge through people's lives. So that they are better informed and make better decisions. So that's the background of the LIFE map and that connects all that those three sectors and the final bit will come with the society as a whole has both as consumers and as voters, so that you've connected every single sector. With a common language the ability to connect knowledge and activity, but then the focus comes on the sustainable life indicators, because our primary work. That we were doing with the ecological benchmarking, we were just in discussions with the [environmental organisation] baselining the ecological work with the life on land sustainable development goal. When we had the referendum in the UK and the various elections around the Western world and the surge of populism and that's confirmed, for the first time in the voting booth that there was within society, there was a level of frustration starting to creep in and the need for blame. And so, we actually work through all of the sustainable development goals. Which all conflicted and we spoke to people for over six months. And we didn't meet anyone that thought that the Sustainable Development Goals had anything to do with them at all. And when we that was enough after about the first month or so, when we were getting this back. We stupidly didn't quantify it as a formal survey, but we then added a bit sort of well. Do you think the sustainable life indicators are important to you, and they go yes. And so, in terms of language sustainable life indicators for something that everybody can relate to. And through that we then went through all the development goals and then looked at how they were structured we looked at the evolution theory management theory, and so we ended up with the natural world as the foundation for life. With marine life and life on land and then the steady evolution of mankind through need for clean water, food, energy, housing, industry and then finally consuming far too much and so that that's how the land sector evolved and then societies evolved through governance, finance, health and education, occupation and then, more recently, the issues of gender equality, equality of opportunity and finally it's dawned on everybody that climate’s quite important. And that, by putting them in this continuous circle life circle. They are all interrelated and that by using the LIFE map with a grid squares you've got everything on the same ledger and you're able to show how the implications and choice. And that's that becomes hugely powerful because any one of these things can be can be addressed but it's what the implication is for the others, and so this shows this continuous balance which is hugely important so that's a bit about the life map. Interestingly, the United Nations have been very interested in what we're doing because there were two elements that they had never encountered they've never had anybody come to them with material for the developed world rather than the developing world. And they've never had anybody come to the suggestion of how to do anything that only discussed any of the thought of strategy so we've been involved with global environmental data strategy we've been involved in the development of digitalization program we're discussing that and we're also part of their accounts and see an audit global program so we were involved in three international or global programs. But one end of the extreme and then the other end of the extreme we've managed to create a system that connects everybody with the process, so we think we have something revolutionary. It is replicable and scalable. And the LIFE map itself is designed on time with 288 hours across the globe, which is how it will be worked on the global level. Anyway, that's a little bit broader, but you asked so you've got it.

INT: No, no that's brilliant. no that's great and just in terms just quickly and in terms of your main audiences I think you've alluded to it already with the landholders, local authorities, schools, are there any other major audiences?

DEU16: Those are the three that were so you've got the you've got the national authorities we've got landholders and elected members of national and local government. Okay we've got schools and research and then, finally, the groups that we will be approaching will be the consumers and voters.

INT: that's brilliant and I’m going to move on to your data requirements now. So where do you obtain your data from.

DEU16: The national data sets come from the national authorities and we're in discussions with the freshwater biological association to produce material for fish we're in discussions with the amphibians, and reptiles conservation do the reptiles we're in discussions with the botanical society of Britain and Ireland to produce the material for vascular plants, and we are in discussion with an affiliate for the invertebrates pollinator section. And there are three sections within the invertebrates that we will be discussing looking to produce, but the pollinator one is one we're working at night so that's the date data sets. The information that we collect comes from volunteers, using the standard methodology. And we've got a program in Cambridgeshire at the moment. There are we've been working with a number of local nature partnerships. And because we're of our association with the university there we've got some on the Cambridge conservation initiative. A whole collection of different projects and initiatives going on across the county and we're at the moment just going through putting in these bird surveys that will be that will be used on each of the project areas so that, for the first time it will connect all of these disparate interests and provide a common link between them and also an ability to collate that activity to emphasize the scale and engagement across the county. And we will be replicating that in others, including North Yorkshire.

INT: And is this data that you receive or obtain is this raw data or is it processed in one way or another.

DEU16: No it's raw data, and we have a program that then the raw data is then processed to report back to the individuals their performance against these national standards and then also to report throughout the communities and the counties to show what is what is being achieved in this at each of these grid squares. And so it's just showing the very best of what's out there which, for most people they haven't got a clue that these things even existed let alone that they've got them in the area and the fact that they've got some of the top 1% in the country must be amazing. Which is a very different messaging system, to what most people get on their tablets, is the fact that the world's about to end which isn't a terribly good thing to wake up to every morning. That this turns around and provide solution control influence all of the things that makes our lives worthwhile. Rather than feeling hopeless desk despair useless and all the other things that most media and ends up making people feel. That is, that is a very different approach to what else is going on, one could be quite cynical that for most of these organizations promoting crisis is a is an enormous way of raising funds and that to solve the problem would cut off their income stream, but that would be deeply cynical.

INT: Okay, you talked about the raw data that you get, what resolution do you use?

DEU16: What will happen so all of that data is coming in to the one K grid Square. Because the breeding bird survey uses the two one K grid square transects K transaction the kilometer we're just looking at the design for series of trials with the for the pollinators. doing the one K transect the runs with a pollinator monitoring system. By using that as a sort of diagonal between the two, so that just trailing that so that you can then you're then starting to build this whole level around that 100 heck with one Cape Red Square, the hundred hectares and we have data for the ready for the local government and national government. Engagement showing the or quantifying the area of priority habitats, for which they are all responsible been elected to be elected to represent on our behalf. So all this question of whether it's some net biodiversity gain in planning terms or whether its international objectives to protect and enhance ecosystems is that for the first time there's a ranking system. That actually quantify where everybody's starting a method to measure change and a system for acknowledging success. There sorry. Good I’m trying to be very polite I get stopped to rant after a while so sorry just stopped me just say, excuse me you're ranting, we need to get back.

INT: In the case that you would use different resolutions would that differ for different purposes so.

DEU16: Well the great thing is that you are able to then. By having that you can connect to broader landscape scale so you've got a connection there where you do go down into lower resolution is when you start using the citizen science. And so you've got things like the time flower contact and things that people can use 15 minutes just watching something or whether you're doing pond dipping and things like that so you've got a got a lower level of resolution. A smaller area within which you're operating and you've got those you've got the research guys that can use any project methodology they like, but if they use this system as part of it, that is where you can then calibrate the much wider research against these using this this tool and so at the end of the process when you've got your control sites and you've got your chain sites and you're able to say, well, this is increased by 20% as a result, these interventions and I’ve seen so many reports of that that are just useless. Is that you just can't run say well actually yeah we've increased it by 20% and it's gone from below average performance to above average performance or it's gone from top 10% performance to top 1% performance. And that, through doing that you've got a much clearer understanding of where that change is happening, the opportunity to then look at return on the return on resources and how you can actually get. yeah this intensification of output, whether it's that it's just question of what products, you want coming out of if you want more corn buntings you can figure out how you can produce called buntings more effectively if you want hen harriers, you can produce hen harriers more effectively if you're on a particular butterfly or something you can you can actually figure out that system, because for the first time there's a calibrated system of linking where you are and being able to look at the responses on a wide range of sites and that's where the building of data sets within the life map, then, is makes it available for research into the features that are associated with the performance and so that gives a much, much sharper and shorter return loop control loops the science and implement implementation. Rather than the open ended chains that never come back at the moment.

INT: And how do you deal with data gaps?

DEU16: Star Wars. The death star. Is that there is a point where you've got enough data or enough pieces in place to recognize the fact that they're building the death star. It doesn't have to be complete to know what it is. At the moment, you've got data gaps because none of the data is connected. By using the LIFE map you're able to start building this portfolio of information. Some of which has direct connection others have gaps, but through inference and influence and repeat information elsewhere you're able to make much stronger assertions as to what might be in that place position and also through the different habitat types through the different land areas through the national character areas you're able to look much more closely as where the gaps are and people are then much more receptive way you're able to identify gaps knowledge much quicker and secondly you're able to target those gaps, so they can be plugged. And that hasn't happened in the past and through the connection and engagement with landholders bearing in mind will we're expecting land to be registered in at least 75% of the Communities. And within those communities 50% of the Communities will exceed 10% in their own right. We have got massive engagement from all sectors of landholders in terms of looking at those eight key features in the in the land element is the sustain life. And then, as we develop the other systems we've got a huge range of people that will be there and being able to look at the human elements as well, so. We should have an extraordinary interface and outreach that none of the research people have at the moment, so quite a lot of them, if you take bird atlas than the amount of time that gets taken to collect that the number of libraries that have that sitting in their bookshelf and question how many people have ever looked at that data. And the fact that we have presented that data to people managing nearly 2% of the land area of England isn't is a very different audience our connection than they would normally be for these documents and that's quite a well-used one.

INT: So I would then ask how do you consider accuracy and precision in data.

DEU16: The methodology is this is quite Burton too difficult because you've got quite a lot of people with a reasonable level of knowledge that are providing the undertaking of this data collection anyway all we're doing is framing the data collection and focusing it's the equivalent of sort of fuzzy logic is now you've got fuzzy knowledge which becomes more critical in things like identifying insects and things and where you've got those bit so you've got bird knowledge you've got within reasonable level in society and what we're looking at the pollinators is doing is so that that's a high level of knowledge and usually expense associated with that and also with the expense associated with that knowledge. The pollinators we're looking at being able to quantify the different categories of numbers of the different categories of invertebrates trap, so that there would be account for bees and wasps counts for flies count for spiders moths and butterflies so you'd have a basic number of those and then the rest of it, the samples rather than sitting in a setting and the deep freeze, like most of these invertebrate samples waiting to be analyzed you just get the whole lot off and send them off to the for the eDNA sampling, so there would be a cost associated with that which so you've got your using the knowledge that readily available and you're substituting it with the expense and technology to substitute that lack of knowledge and you're doing the same thing with water quality. So that at the you've got the information about the birds that are in each of these communities and you're doing the work there, but for the fish. You've got a sampling point at the beginning of a 10 K grid square or principal entry point principle, leaving point, and most of the DNA samples run over approximately 10 K length. And then you're able just to sample before and after measure the change at a Community level that connects people so that yeah you might have 40 landholders that dominate that 10 K grid Square. But you might have 4000 residents and it's being able to connect those 4000 residents with what has changed over that that then ask the questions to the landholders going are you racking this or whether there's a water company sewage treatment plant that's ruining everything is the word company that's ruining everything but you're at least engaging that dialogue throughout society and connecting everybody to those decisions so in answer to your question there's technological advantages advancements of a DNA sampling for some of those processes.

INT: brilliant that's great I’m just conscious about time, and so I think you've discussed a lot about your how you communicate your data so that's great I’m going to move on to the data aspirations now. So how could the data you use be improved help your decision making.

DEU16: it's not our decision making what we're doing is providing data to enable resource managers to make better decisions so it's the data that we're providing to landholders and through policy and if you've got policy and landholders. Being able to make better decisions as a result of the data that we're providing and then ultimately, as we said, consumers and the electorate. Having that information and being able to make better decisions so we expect this process. And the people that you're speaking to and every other level is that they're all looking at their particular component we're providing a conduit that would allow all those components to reach society like those better decisions so.

INT: Is there any additional information that would help those audiences that you're intending for to help them interpret the data.

DEU16: Interpretation is not so much an issue because you've got all of the different organizations, because the material which present, so the bird data doesn't have any of our contact details on it, it has details about [BIRD CHARITY]. The information that will come through from.

That fish will have the freshwater biological association so we're promoting the organizations that can lead on that and that are having their own citizen science programs that are aligned to it. So you know the key thing is that the problem with what we're doing is that it's. All the existing financial support structures, supporting a system that's failed for 30 years and just looking at sort of well if we just keep putting more money into it, it might work. When we present what we're doing is that people that have got high levels of science, like know turn around just getting this bit simple, for us, and then, when you talk to people about simple outreach stuff getting a bit technical for us and saying there's they're just all bit nervous about something that's telling us that saying this is so obvious, it will work and getting them to actually invest in, and to contribute to it or accelerate the process of what we're doing because we haven't got a lot of time. And so, applying the green recovery funds and things like that is going yeah that's great, but if we replying to produce Fourth, plant 4000 trees. For Community neighbourhood we'd probably get the money from 4000 trees, but to put in a funding application to record those 4000 trees in the Community, and then to enable that to connect with others, but we're not actually doing so, we don't qualify nothing, nothing that we do qualifies for funding, but it actually shows everything that funding is doing and how it all fits together.

INT: that's great okay well finally I’m just going to look at some model data in a bit more detail. So, how would you feel about using modelled data instead of raw data.

DEU16: Where does the model data come from? Modelled data comes from using real data and extrapolating it, doesn’t it? So that the fact that we've got this data, what we're doing is constantly revising and enhancing modelled data in this system. And hang on the other thing is for your modelling for the people doing this modelling data is that it also the system also provides a really good opportunity to test those modelling systems and see if they get the response that they anticipate. So we have a huge resource there.

INT: I’m just going to show you some model data outputs that part of the CEH team has created. Are you able to interpret these at all?

DEU16: I haven't got a clue what species.

INT: oh sorry yes that's a six spot burnet.

DEU16: Okay yep well that's The first thing is that's classic science doesn't say what the fuck it's about. So distribution of six spot burnett variation is that a substitute subspecies of six, burnet. Okay, so yeah you got those bits there subspecies. Probably. I can just leave the first few slides I can't see the probability distribution or the variation.

INT: So these are just around the point in Wallingford at five kilometres. So yeah, the one on the left is raw probability on a national scale. And the model uses 21 land cover variables and 19 climatic variables. Along with literature and conditions where the species is found. And then on the right. This is a variation model. So it's calculated using a sample of the background data to give a range in the predicted probability. So the model in this case was run 10 times on 10 different data samples. Do you find this useful in any way at all.

DEU16: There vague yeah there if I was interested in whether I should have these months or not. Our system would turn around and show these most likely to be in your area that this is the suite of species, you can see, this is what they look like. yeah and the by using a 10 K Red Square you've then got the ability to connect all of the information sources in the standard format, so that yeah so it's it's nearly useful.

INT: Then just ask is there any information that you would include that would make it more useful.

DEU16: What for these things. picture on the top corner. So if you put a picture of what it's actually about. That would be helpful and whether it's a priority species or not that's from my point of view so you've got whether it's a generalist or whether it's a priority spacious and then, if you're using grid system or what three words or whatever way you are able to like account for it is that again using our system you just be able to put in TL 33, hit that TL 33 and that would show the show whether it's in your community and that's connecting every everybody in that community with that information.

INT: So we're going back to the point about this gap between science and society. So just to wrap up and was there anything else that you want to tell me.

DEU16: To rather than having to apply for this bloody funding from the green recovery challenge fund. To speak to somebody in [ENVIRONMENTAL RESEARCH AGENCY] about doing exactly what they're paying everybody else to ask people about what would be useful, is to be to accelerate this program. And then the second thing was about North Yorkshire because North Yorkshire has been funded in the life map and the wildlife trusts usually register land first as the foundation for nature recovery, the auction wildlife trust has done that. And we currently have land registered on I think it's about half the 88 grid squares across North Yorkshire and about 440,000 hectares hundred thousand acres and that's about 5% of the county. Or it is 5% of the county and we've got 44,000 hectares register because there's a bit of the sea area and that so there's a huge resource in Yorkshire around you with guys registering interest in sustaining life and showing how land use uses that and or influenced his life and would be very pleased to have you got research stuff in the university. Then we'd be very pleased to work with you guys in developing knowledge and applied knowledge. What I’m hoping, some questions for you.

DEU16: Have you got have you got a 10 o'clock appointment.

INT: I will have to dash off at about 10 past but that's.

DEU16: Okay, no that's fine sorry it's been a long time to get connected. The people that are coming back to you are they all tending what, what are the sort of groups coming back to you who's coming back to you and helping you responding to your request.

INT: Sure, so we've had Local authorities. And we've had conservation groups. we're having environmental consultancies. So we've had an a range. I can't name anyone but.

DEU16: No, no. I don't expect you to. [county] counts of central [county] district council who got it we've got a consultancy in to review their green and blue infrastructure. Okay, so we've been participating in that process. But this information, the local authorities. Is that our system provides them kids all the tools that they need to know to meet the Biological and biological elements of the biological and climate crisis that they resolutions that they've all been pressured to pass and then come to cut as a shock that people are expecting them to actually do something and just going, or what we have to do so, this system answers a lot of those things. It gives power to the environmental groups and for the consultants, it gives a common language that links to different components. So I’m hoping that what we are offering. A huge relevance to what you reports.