

Floodplain Meadows Partnership Conference

Day Three – 15 October 2021 am – Session 1

Introduction

Emma: Welcome everybody to Day Three of our conference, the final day. I really hope you've found something to enjoy and if you've not already joined us I hope you find this morning's session useful and stimulating and this afternoon wonderful and inspiring we hope. So we're starting today with a session on exploring the history of floodplain land use which we will follow with a discussion on how we can develop this concept to support groups who want to research their local area more. Our 2nd session focuses on strategic mechanisms facilitating restoration and we finish this afternoon with an hour of Arts and Crafts. So with no further ado I will introduce our Chair for the first session. I'm delighted to have Katey Stephen here who is a senior grassland specialist at Natural England, a role she started in 2020. She also represents Natural England on our Steering Group. She was previously a lead advisor with Natural England for many years in the West Midlands responsible for grassland and woodland SSSIs in the counties of Herefordshire, Worcestershire and Gloucestershire. So over to you Katey. Thank you very much.

Katey: Good morning everybody. Yes a fantastic soundscape that just so refreshing first thing in the morning. This first session is about an exploration into the history of floodplain meadows. So a little bit different from the last few days, but really looking forward to it. We're going to hear from 4 speakers followed by a Question and Answer session. So if you can either put your questions in the chat or raise your hands during that session at the end that would be great. But without further ado I'm going to introduce our first speakers. Dr Antony Firth and Emma Firth from Fjordr are going to talk to us about an assessment of the extent of floodplain meadow historically using 2 areas to trial a method and with that I'll hand over.

Dr Antony Firth and Emma Firth (Fjordr). An assessment of the extent of floodplain meadow historically using two areas to trial a method

Antony: Good morning everyone. I'm Antony Firth. I'm presenting on behalf of myself and Emma Firth who's with me here. We're from Fjordr Ltd. We're a small heritage consultancy based in Wiltshire specialising in the heritage of inland waters.

Over the last few years we've developed a GIS-based methodology for flagging the historic character of rivers and other watercourses. The methodology has been developed through 2 projects funded by Historic England, one on the Dorset Stour and one on the River Culm in Devon. Where we see evidence of human activity or interventions related to the watercourse we map them as historic watercourse polygons, HWPs as a GIS layer, and we record their core information. Now the rationale and implementation of this wider method is set out in our report on the Dorset Stour which is available online. By mapping and recording historic

watercourse polygons we're able to synthesise diverse sources including historic maps, LiDAR data and existing archaeological and historical records into a single layer. Methodology is strategic in intent and is applied at catchment scales to produce a GIS layer that can be used by catchment managers to alert them to the presence of historic features and the HWPs we've identified encompass numerous different types and things so water mills, crossings, waterfronts, paleochannels and so on.

In the historic mapping for both the Dorset Stour and the River Culm we noted these distinctive forms of field alongside the rivers which we'd termed funnel shaped meadows because of the way that they usually funnel into a prominent green lane or drove. Hopefully you can see those funnel shapes. Such funnel shapes point to the routine movement of stock to and from grazing echoing the funnel shapes found on conventional Commons and coastal grazing marshes. It was clear from their form that they predate enclosure because the enclosed lands fill in around the funnel shapes and drives. On tithe maps some of the fields are subdivided, and they often have mead names. It was pretty obvious that they were a form of floodplain meadow which led us to the Floodplain Meadow Partnership.

As a result of our initial discussions the Floodplain Meadow Partnership commissioned Fjordr to see if our experience might provide the basis of a methodology that could be used more widely to gauge the earlier extent of floodplain meadows. Emma and David also wanted to know how far we might pursue the relationship between floodplain meadows and parishes and their potential relation to medieval populations.

The work was planned in 2 stages. So first we would look again at the Stour where we already had access to sources to see if we could attune our methodology to these questions. Thereafter, we'd look at an area that was new to us along the tributaries of the Thames. Our study area for revisiting the Stour was a cluster of 7 parishes in the Stour's middle reaches. We drew again on the sources we'd used previously such as LiDAR data, but we also had access to some additional sources notably OS drawings from the early 19th century from the British Library, and they pushed back our mapping window a little bit earlier. We also looked in a lot more detail at the tithe maps and apportionments digitising all the plots in the floodplain and some with meadow-related names outside the floodplain and recording the plot names and cultivation as recorded in 1840. As you can see here, there's a fairly strong association between mead names and the floodplain, but it's not definitive there are also meads outside the floodplain.

Overall this gave us a set of rules or tests that we could use to guide our identification of these distinctive meadows, even if they'd been subject to encroachment and enclosure. So they're mostly in the floodplain. Some seem also to extend at valley sides. They have a funnel shape or clear access to settlement. The

river often forms one of the principal boundaries. They're often subdivided into doles, they're typically cultivated as meadow or pasture according to tithe maps. Where they've been enclosed their new boundaries often reflect the earlier dole system, or they have field names indicative of common meadows. So if we can see some or all of those characteristics it can give us confidence about the former presence of common floodplain meadows.

The result of this re-examination of the Stour is that we identified some additional floodplain meadows and we revised the extents of ones we'd identified previously. Each of the floodplain meadows has been numbered and is discussed in the project report, including the grounds on which it has been identified and the rationale for its boundaries, how we've identified those boundaries. As you can see, I hope, the floodplain meadows are numerous and extensive in the parishes we examined. The results confirmed the strong relationship between communities and floodplain meadows underlined by the associated drove ways which are dotted in in green here.

Turning to the question of the relationship between floodplain meadows and the earlier landscape. We mapped the settlements referred to in the Domesday survey of 1086 along the Stour and noted the acreage of meadow that Domesday records. As this map shows there's a consistently high acreage of meadow in the settlements adjacent to the Stour along about 2/3rds its length. The only notable gap is a short section here where the Stour cuts through the chalk and the floodplain is quite constricted there. Similarly we mapped the number of households recorded in Domesday for the same settlements along the Stour and it presents a similar picture.

When you plot the acreage recorded in Domesday against the number of households, it confirms that there's a moderate relationship. This indicates that on the Stour at least there's a degree of correlation in 1086 between the extent of meadows and the number of households in each settlement. Further, it seems there's also a relationship between the amount of floodplain meadow that we've mapped and the acreage of meadow recorded in Domesday. So we've got here meadows in Domesday in grey and the acreage of floodplain meadows that we've identified in orange. So the juxtaposition at Hinton St Mary, so some of these, Manston, Shillingstone is really quite striking. But we'd advise considerable caution because we're making some major interpretive leaps here with the sources so I wouldn't put too much emphasis on this, but there does at least seem to be some kind of relationship. Taking the same approach to an area of the Thames including part of the Windrush, the Cole and the Thames between them. The approach developed on the Stour worked very well but there were some differences and challenges and one of the challenges is the variable availability of tithe maps and apportionments, as shown here, leaving us with some gaps. Another challenge has been the complex history of the parishes and counties which have their boundaries running along these rivers. Parcels of land have switched between parishes and

counties here and there's also examples of inter-commoning where use of the same floodplain meadow is shared between parishes. So the example here refers to Achim Mead and Upper Sydenham Mead in Northmoor and South Leeds parishes respectively, but which Standlake commoners have rights to at Lammas.

Nonetheless, where the data was available we were able to map cultivation types and field names and there's a lot but there's various of these which point not only to them being meads, but to the process of leying out and mowing and so on in the field names.

With the other sources these allowed us to develop a similar map of the Thames tributaries showing floodplain meadows, drove ways and their relationship to settlements and parishes. We also looked at Domesday in relation to the information it contains about meadows and households in the area, and the relationship between the Domesday and our results. However the coverage of settlements in the Domesday survey is patchy in this area requiring even more caution. Nonetheless, there's still a relationship between households and meadows in these Thames tributaries in Domesday, though it's weaker than in Dorset and one of the factors might be the extent of floodplain available. So on the Thames there's so much floodplain in some of the parishes that it seems people could select areas for common meadow with other areas of floodplain left as common grazing, whereas the Stour floodplain being constrained results in a more deterministic relationship.

So we feel we've been successful with respect to our brief, we've been able to identify and map the historic extent of floodplain meadows. We've explored their relationship to parishes and settlements and with reference to the Domesday survey, identified some tentative relationships between the floodplain meadows with mapping and medieval populations. Successes and challenges indicate that this is a productive route for further research and we've certainly demonstrated the potential for public engagement in terms of adding to the historical dimension of floodplain meadows and especially their local context. We've also flagged directions that could be taken by community groups in investigating their own floodplain meadows.

Some broader conclusions worth underlining too which I'll just go through very briefly. So we've shown that common floodplain meadows persist in the landscape, even where they're previously unrecorded. In some cases their form and topographic features survive, even if their habitat has been extinguished by improvement or intensive agriculture and even where they don't survive physically, we can trace their presence in other sources such as historic maps, documents and archive data. However, old maps don't speak for themselves. By the time the first large scale precise maps were made, such as tithe maps and OS maps, floodplain meadows had already disappeared in some places as a result of enclosure or other encroachment. In these cases identification of former floodplain meadows requires interpretation based on multiple sources. Moreover, the maps we're using represent

only a few data points of quite brief duration. So some caution is required about the weight we place on them. Notwithstanding, there are sufficient sources for the earlier extent of floodplain meadows to be mapped in many catchments.

We have a robust and transparent method for evidencing the former presence and extent of floodplain meadows locally and regionally and this offers a way of quantifying loss and rarity. It is also a way of flagging potential sites for restoration, especially where their physical features still survive. As well our method provides a means of directly integrating restorable meadows into catchment management alongside other opportunities for nature-based solutions as we're doing at Killerton.

Our work emphasises that floodplain meadows are not just physical things, they embody cultural practices, both tangible and intangible and their forms manifest practices over many generations. Their character is undermined by this relationship with the parishes and settlements and also the droves that made them accessible. We can learn from their history in re-establishing habitats, places and communities resilient to climate change. Thank you.

Katey: Thank you very much, Antony. That was so interesting, I would rather have just let you run on for another 5 minutes but thank you very much for that. We'll take questions at the end. We'll call back all our speakers at the end. So if you could hang on for that Antony that would be fantastic. Okay, next we're moving on to a presentation from Dr Alistair Pearson on historic investigation into land use in the River Rother floodplain. Alistair is currently a GIS analyst at Southeast Rivers Trust having previously worked as an academic in the University of Portsmouth where he continues his research. His recent research has concentrated on the application of GIS to the study of landscape evolution with a specific focus on the analysis of historical landscape change.

Alastair Pearson: An historic investigation into landuse in the River Rother floodplain.

Alistair: Good morning everyone. My talk will look at the work we've completed in the Lower Rother catchment in West Sussex. This is the Western Rother part-funded by the South Downs National Park and the National Trust. The research sits within the South Downs National Park and maybe on a fine evening like this it might look idyllic, but it has its environmental problems. It's the newest of the National Parks. But it is the most intensively farmed of any of the UK's National Parks. A fact that's fairly obvious in the impacts on the environment particularly its rivers and its poor ecological status.

Soil erosion is quite dramatic in some instances bank erosion impacts on water abstraction has led to a very poor ecological status for the Rother catchment. The floodplain consists of improved grassland monoculture. So what we thought we

would do is to look at the past and think about if we were to restore stuff, what would be the objectives? What should we restore, how far back should we look and which attributes of the past might be aspirations for the future catchment?

Just to fill you in briefly on the geography of it, as you can see here we have 3 of the main market towns in the rather - Petersfield, Midhurst and Petworth. All 3 of these towns lay on the major routes from the South to London and so they are major route ways. Certainly through the medieval period into the modern period of droving of sheep and cattle and produce, a highly agricultural area. In our look back the previous speaker has already mentioned tithe surveys and they formed really a fundamental part of what we were going to use as our baseline study if you like. So we we're going to use the tithe surveys and we're lucky in that West Sussex is covered pretty completely by tithe surveys. That's a fact that's not necessarily the case throughout the country. Also West Sussex County Record Office had scanned to a very high resolution the maps themselves and volunteers had input the apportionment data as well. So we're in a position to be able to digitise the tithe surveys themselves and pull together this information to produce our land use maps. But we'd also benefit from the plans of the Rother navigation, an enterprise commissioned by an old agreement of Petworth estate and there were numerous maps that were created as part of this.

The tithe surveys, as already mentioned, were going to act if you like as a guiding image for highlighting sites where resources could be directed and prioritised. The tithe surveys in the mid-19th century were constructed basically to commute the payments in kind, every tenth sheaf of corn or wheat or barley given to the church with a money payment. So therefore surveyors were sent out to survey the locations of places but more importantly to create this schedule of information about the land ownership and the state of cultivation and its value. So it's a huge amount of data locked up inside these tithe maps. What we did with students at University of Portsmouth is to digitise all 43 of the tithe districts that constituted the area of the West Sussex part of the Rother catchment. Quite a huge undertaking, it took several years but now we're beginning to use the profits of all that labour. Of course the tithe maps vary in terms of the detail that they show. Here we can see a very ornate one typically of an estate that would probably have been previously commissioned prior to the tithe survey. It's not just the rural areas that provided information from the tithe surveys, the tithe surveys of the towns themselves can actually be extremely useful.

So we can build up our Victorian GIS, I'm sure if they had computers they'd have created a GIS using this because here's a perfect model of a GIS. There's your spatial information, there's your schedule of information, a unique ID for every field linking to your schedule and so we can start to build up our land use map of the past. So putting the information in, of course, is difficult, but what we've done is to digitise it using national grid coordinates so it's compatible with other data sources which is very important. So that's an important step when you're starting with this sort of

research is to make sure that it's compatible with other sources. Here you can see we've been using aerial imagery, Ordnance Survey maps, to register our tithe maps, so that they are co-ordinated in a way that we can use other datasets from elsewhere, such as LiDAR, for example.

There's the digitising, that's what we were doing for a long, long period pulling this information together. The other information we can gather of course from the Rother navigation, it just shows how sophisticated the drainage pattern was in the Rother with back drains and sluices even drains going under the river in order to move water around the floodplain, quite sophisticated and these maps were invaluable, as were other maps that we found showing the meads held in common along the floodplain. But what about the maps? What about the results? Well here you can see the 43 tithe maps pulled together in a land use map that basically provides us an image of the past in the 1840s and what's striking about it is the amount of heathland that there was there. Now predominantly woodland plantation, but also the Rother running through the middle. If I move on to the next slide, you'll see it in a bit more detail.

Here you can see the Rother winding its way through the countryside followed by the floodplain meadows, which are both sides of the river all the way along and there's no evidence of this in the field at all. It's only through the historical record that you can see this and you can also see in yellow, these beige areas, the areas of dry meadow surrounding all the towns and the little villages as well. So you've got floodplain meadows and a lot of dry meadows as well in the catchment. We were able then to name each of the meads from the tithe surveys and the Rother navigation maps so that we could document in detail the locations of all these meads along the Rother's floodplain. In a bit more detail we can look at each of these with the tithe survey and show the land ownership and the strips within the meads these held in common. What was interesting was that there seemed to be points that were very important in the setting out of these strips and when we went out into the field we were delighted to find a dole stone sitting right on this location here, a point that must have been used in the setting out of the strips when they were drawing lots to allocate the strips to the various people who had rights to it.

So we can go into some detail when we're looking at particular sites using historical data. Inter-commoning as was mentioned previously, was very important. Here you can see that same area of meadows shared by the parishes of Fittleworth, Coates and Bury. Hopefully you can see the central area of the meadows with the different coloured strips according to which parish that person was able to use that strip. So they were very central not just to one parish but to several parishes, a very important part of the community and the economy. We've also spent time looking more intensively at the actual meadows drainage management system, the water management system and here we can see that if some restoration were to take place that in the past there were drainage systems, back drains, carrier drains,

sluices that were used to manage the water across the meadows as carefully as possible, not too much water, not too little, but carefully managed in order to be able to maintain high quality pasture.

So what we're hoping to do, and we haven't got anywhere with this yet, is to try to build a case for looking at perhaps some reintroduction of meadows along the floodplain, maybe not to the level of sophistication and management of the past, but certainly the hope is that we can move from this monoculture of the floodplain with all the problems that seem to arise in terms of the water quality, to something that looks a little bit more like this. If you're interested in looking any further at some of the information I've been giving you then we've basically got a site where you can download all the data that I've just been talking about and if you click on this link then we can get to basically a website where you can download the whole tithe survey data that we collected for the Rother. That's it. Thank you very much.

Katey: Thank you very much, Alistair. Very interesting, and I'm sure it'll generate a lot of questions in our Question and Answer session after these 4 presentations. We'll move swiftly on and we're now going to hear from Martin Hammond who is an ecologist for North Yorkshire County Council and he's going to talk to us about historic floodplain meadow extent on the River Swale, Ure and Ouse.

Martin Hammond: Historic floodplain meadow extent on the rivers Swale, Ure and Ouse.

Martin: So I'm going to talk very much in a similar vein to the previous 2 talks, I'm going to be talking about the extent of floodplain meadows in the past in an interconnected catchment in North Yorkshire. So I've studied 2 slightly overlapping areas that form part of the Humber river basin which drains a large part of Northeastern England. So one area I've looked at is the Swale and Ure washlands. This is the geological river floodplains of the 2 rivers that drain the Northern Yorkshire Dales. So the River Swale in the North to the River Ure which runs more or less parallel to that in the South. So these 2 rivers converge just below Boroughbridge and below that point they become the River Ouse, and the study area extends along the Swale upstream to Catterick and along the River Ure upstream to Masham. So these are lowland agricultural landscapes.

The study area on the Ouse corridor covers the area between the point at which the Swale and the Ure meet downstream to the Derwent confluence in Selby district. So what I've done is gathered together a fairly wide range of landscape history sources. I won't go through all those individually but I will mention a couple. It's worth emphasising that certainly in Yorkshire, a wide range of historic documents have been translated from Latin if they're early documents and transcribed so that a lot of these are quite readily available. People think there's a great mystery to these historic sources, but often there really isn't and you can glean an awful lot of

information. Many of these are published, they're searchable PDFs that are available on the internet and so on. So there is a huge amount of information out there that is readily accessible, even before you start looking at original documents in the archives and so on. So a couple of really interesting sources. One is documents called Inquisitions Post Mortem. So during the feudal period when the Lord of the Manor or the Lady of the Manor died, there was a very detailed bureaucratic process of inventorising their assets. So that gives you all sorts of useful information not only about the area of different land uses within the Manor, but also the value of different land uses. So that's really useful for generating information about how valuable meadows were in comparison for instance to pasture or arable. From that we know for instance that floodplain meadows were typically worth about 4 times as much per acre as arable land in North Yorkshire. Another really interesting source is Manorial rolls. So these are the records of the manorial courts which effectively they were the common governance of the Manor. So these were actually quite influential bodies of self-government. Ordinary folk had much more representation in the manorial courts than they did really in any other sphere of public life and it's important to understand that although there were enclosed hay meadows the vast majority of floodplain meadows were part of the common resources of the Manor. So along with the grazing commons or moors and the open field arable, the meadows were subject to common governance, they were regulated in considerable detail and all of this was recorded in the manorial rolls. Now often they haven't been transcribed and up to about 1600 they tend to be in like a highly abbreviated Latin shorthand, and of course, written on parchment. So that's quite a specialist area but it provides you with a really, really vivid picture of how these meadows were managed historically. Another source I will mention is botanical records and herbarium records. So for instance, for the Swale and Ure washlands we have botanical records that go back to the late 17th century and they can tell us quite a lot about environmental change in general, but quite often specifically how these meadows have changed in terms of their flora.

So the meadow system was very similar to the examples that have been described today in Dorset and in Sussex. So meadows that were divided into numerous narrow strips or doles. But after the hay was harvested around about Lammas Day at the beginning of August the meadows were thrown open to common right grazing and this is essentially a very common system all over the country. So the same in Herefordshire, the same with the Thames meadows in Oxfordshire and it's important to realise that hay was an absolutely essential resource. I think we sometimes use the term meadow without actually thinking about what meadows we're there for. Everyone who lived in rural villages was at least a part-time farmer and you couldn't function without hay. Hay was a very essential commodity, not only do you have to keep your livestock over winter, but you had to keep the country moving. So all your beasts of burden, all your horses that were used for transport and for haulage and so on would need hay throughout the year. Military horses would need hay. There were lots and lots of uses of it. So it was an incredibly important and valuable commodity.

So as I've mentioned the use of these meadows was governed by the manorial courts. The illustration here is just actually at the confluence of the River Swale there and the River Ure close to Boroughbridge.

So on the River Ouse when we started to plot the extent and distribution of meadows we managed to get a reasonably definitive picture, slightly less well defined along small watercourses. It is important to remember that although most of these common meadows were located on main river floodplains, there were also floodplain meadows along quite small watercourses. I mean sometimes these are now quite minor brooks or backs but often that is where some of the meadows of the Manor would be located. As we've seen with the River Rother, the speaker before me, these meadows were almost ubiquitous in river floodplains. So the vast majority of townships in lowland Yorkshire had their own at least 1 common meadow, sometimes 2 or 3. These were usually known from the Norse name of Ings. So on the River Ouse within the study area, we worked out a pre-enclosure extent of 1236 hectares of floodplain meadows. Very little of that survived so we've got about 90% loss of historic floodplain meadows, much of what survives is located within five triple SIs, unfortunately part of one of those is about to be bulldozed. Then there's a small area of degraded or semi-improved grassland that is potentially capable of restoration.

In the Swale and Ure washlands there's a very striking difference here. We didn't really think that floodplain meadows were an important part of the historic landscape and that proved to be completely wrong. The reason for that assumption was simply that there are no surviving examples at all. So unlike the Ouse where there are 5 floodplain meadow triple SIs, or the Lower Derwent Valley to the East where there's a large area of surviving floodplain meadow, as far as we know there are no intact examples on the lower Ure and Swale valleys. So this was an overlooked concentration of floodplain meadows. There have been more early enclosures in this area, so the enclosure process began in the Middle Ages, it didn't just start around 1750. So there were large enclosures during the Tudor period and this seemed to be the case more in the Swale and Ure washlands than on the Ouse. So in fact we know that there are a number of meadows that we know from documents, but we can't actually locate the boundaries of those because they'd already been amalgamated or turned over to other land uses before 1750. So we've identified nearly 100 named Ings or floodplain meadows within the Swale and Ure washlands. Some of these were really large. So the map here plots the boundaries of one large meadow Cod Beck near Northallerton. It's a tributary of the River Swale and in fact this was conjoined of other meadows some distance upstream. So this would have been a huge tract, it would have been the dominant land use in that river valley. So a rough tally of known sites comes to just over 1000 hectares in the Swale and Ure washlands, but we've got a reasonable estimate of at least 1300 hectares there. So it's rather striking that that exceeds the surviving area of MG4 grassland in the whole of Great Britain now. Again the same applies to the Swale and Ure catchments as to

the Ouse, there were floodplain meadows along small watercourses as well as the main rivers. There were floodplain meadows along the other rivers that drain into the Humber river basin so within the Ouse catchment there were meadows along the Nid and the Wharfe and the Ure as well but they haven't really been investigated yet. I've just started to look at the River Wharfe that converges with the River Ouse near Tadcaster and there were certainly extensive floodplain meadows there. From just a very, very rough scan of the maps, there would have been at least 400 hectares downstream of Wetherby remaining in the early 19th century. So about 1000 acres there. There is very, very little remaining, we talk a lot about restoration and so on, it's important not to forget that some of the surviving remnants are under threat. This is a very unfortunate example here. I went to a meadow that was actually mentioned in the Domesday book and I found some strips that were full of meadowsweet and great burnet but it was all curled over because they'd just been sprayed with herbicide. So even where we've got surviving remnants those aren't necessarily safe and it's quite important to emphasise that conservation of what we've got left is as much part of the picture as restoration of what we could put back in future.

Katey: Thank you Martin and on that rather depressing note at the end perhaps we need to talk about that separately. We will now move on to a video I understand from Professor John Rodwell. John probably doesn't need any introduction but here we go. John Rodwell was the co-ordinator of the UK National Vegetation Classification, and editor of British Plant Communities. He resigned his professorship at Lancaster University in 2004 and now works as an independent consultant providing research and expert advice for statutory agencies and the Environmental NGOs in this country and elsewhere in Europe.

Emma: Can I just add Katey that he would have loved to have been here but we couldn't make the Teams set-up work for him so he pre-recorded it for us.

John Rodwell: Place-names, maps, letters and local knowledge in a South Yorkshire floodplain.

John: Good morning and apologies and regrets that I can't be with you in person today for technical reasons. This is a presentation given by 2 people, myself and the late David Hay who died five years ago. David was a landscape and local historian at Sheffield University and he and I collaborated on this and other pieces of work bringing together his skills and mine in a way which we found extremely satisfying and rewarding and I hope you too are interested in this story.

This is the area where we worked a little shot out of MasterMap here. It's the Dearne and Dove valley which is just to the Northwest of Sheffield and you can see that the landscape at the moment is prevailingly agricultural farmland with some fragments of woodland mostly recent, and then a mixture of urban and suburban areas together

with quite a lot of post-industrial landscape because this was until relatively recent time an area of coalmining with associated industries now all gone.

This shows the physical geography of the area. Notice how broad the floodplain of the Dove and Dearne are. These are relatively small rivers with small catchments but the floodplain is quite broad, the land rises from bottom right about 5m above sea level to 180m in the foothills of the Pennines to the left. Above right you can see a shot of the floodplain at the present.

This is the underlying geology, alluvium where the floodplain is and then the rest of the landscape is a corrugation of uplifted grit ridges and in between these shale vales oriented Northwest to Southeast.

This enlargement of the aerial view of the floodplain shows how it is more or less at the present time. The river runs from top left down to bottom right and then across the front of you. The areas of open water are subsidence flashes caused by the collapse of underlying coal seams and you can still see on the surface of the floodplain the position of the old drainage ditches which marked out the ultimate enclosures of the floodplain and surrounding the urban and suburban landscape and intensive agriculture around as on the floodplain itself at this present time.

This is the range of historical records and other assets which we had at our disposal in this study, 2 half tax returns and then 2 Charters from the early 1600s from the major landowners at that time. Trinity College Cambridge inherited some lands at the Reformation and we have maps and documents from their archive. The Napoleonic Crop Returns were an interesting resource. These were returns made by every parish in government command at the time to show how much land lay under what kind of agricultural crop. The Tithe Apportionment Map produced in 1840 when tithes were abolished and replaced by cash payments and the accompanying survey, census returns from 1841 and then a variety of government agricultural surveys, in particular the 1942 Second World War survey, as well as MasterMap and some recent local maps.

The character and history of the floodplain are intimately linked to the township itself. Here we can see shown in black is the growing urban area of the township on a number of maps and then bottom right the population of the town from the 14th century onwards till the beginning of the 20th century. The big rise in numbers in the late 1800s was caused by the start of deep coalmining and an influx of working people and their families.

This is a reconstruction of the medieval landscape from the 2 Charters which we had at our disposal. The floodplain is shown as fine stipple. This is the extent of alluvium and then above this on the uplifted land are the 3 arable fields, open fields at the time, whose shape and extent we can work out from the Charters. Then woodland

shown as coarse stipple. All these were agricultural assets for the community which were bound together in an interlocked system of land use, common land use of course on the floodplain and in the arable and with common access to the woodland.

We know from the Charters that low lying land in the floodplain was called Ing or Ings. This is repeated in a variety of places across the floodplain. Ing is a Middle English word meaning 'flooded meadow' or 'low lying wetland'. Roger Wombwell and Healaugh Priory are the 2 major landowners both held strips and furlongs in the meadow as it's called in the Charter. So this gives us some clue as to how the land was managed at this particular time. Neighbouring townships have references to float or floyt in the way the floodplain was managed and this suggests that some of it, or all of it maybe, was managed as a kind of water meadow in which the flow of the water over the surface and the depth of the water and the movement was controlled, but we don't have any other evidence in favour of that. The Manor Court shows fines imposed for poor maintenance of banks which kept the water under control towards the edge of the floodplain and there is in the 1379 half tax a reference to a man called Richard Dyker whose job it was presumably to dig and maintain the dykes or ditches on the floodplain.

There's also a reference on part of the floodplain to moor, Old Moor and Wet Moor are the areas shown on the right of the floodplain here. Moor is an old English word meaning a 'barren, wet place' and this would be not moorland as upland but probably lowland graze mire, perhaps a local accumulation of thin peat but that's entirely gone now and we don't have any record of Turbary rights.

Trinity College at Cambridge when they acquired land from the dissolution of Healaugh Priory commissioned a map and records of their holdings. They inherited this land together with the patronage of the parish that is the right to appoint the vicar and a share in the tithes or the 10th of the value or actual crop from the arable and hay lands. They commissioned a map in 1757, a rather beautiful map made by a cartographer in Leeds to record the extent of their property.

This is what we can deduce from the records and the map of Trinity College. The extent of the open floodplain is much reduced now and it's shown here again as fine stipple. There's interesting correspondence between the Vicar of Wombwell and the Master and Fellows of Trinity College because the Vicar was not getting his tithes, his due 10% of the produce or its value from the lands. Collecting the tithe on the corn as it was called, is simple he could turn up at the mill, there were 2 mills in the parish and collect a share of the flour, but the hay tithes were paid in cash or not paid as he complained. He says, 'I'd be much entertained by promises from the people of Wombwell, they give the clergy brass for gold.' He said this in 1767. But the important thing about this is he does say there, 'That land in the valley is being cut for hay.' So we know that the management continued in this way in open fields until the late 1800s.

This was another map commissioned by Trinity College which shows the extent of their lands which were amalgamated here into blocks on the floodplain and notice the river is at present constrained, that is it's not embanked and therefore presumably able to flood easily over the land in the winter. In fact, there are records of the passage from the 2 sides of the valley being blocked by the depth of the waters.

By tithe apportionment however we can see here that the whole of the valley floodplain shown on the previous extent on the map that that area is now completely enclosed in these fields. The fields are recorded as being either arable or as grass. It doesn't say whether it's pasture or meadow but it's all enclosed and the river notice has now been straightened along the top of the coloured area. It's possible to plough in the valley so presumably that, as far as possible, the waters were controlled at this time and there's been a shift away certainly from common management of the valley bottom fields on the floodplain.

The tithe apportionment also tells you who managed the land and here we can see it's divided up into several now tenant farmers or owners of the land, absent landlords. Therefore the common use of the land in strips has passed away, although a 1/3rd of the population of the parish were still farmers or farm labourers. So at this time it's still prevailing an agricultural landscape. The first deep mine was opened about 15 years later.

The 1942 National Farm Survey is extremely detailed and it tells us that there were a reduced number of landowners here at the present time. Again the blocks of colour indicate different landowners. Mr Hinchcliffe farmed an extensive area of the floodplain, partly rented from Trinity College and the records of the farm survey tell us how much arable land he had under what crop but also how much of it was pasture and how much of it was meadow. It doesn't say anything more about the management of course, though you can see quite a lot about the detail of how the farm was managed at the time, presumably more intensively now with chemical fertilisers as well as animal dung.

We know from a relatively recent archaeological survey that there was a prehistoric farming activity in this neighbourhood. Here we see an area which was excavated which shows an enclosure and field system with Romano-British pottery and carbonised remains of cereal grains. So clearly arable farming is of ancient times on this particular land. If we expand that little block this shows more or less how the thing lies at the present time with these subsistence flashes and the old drains running across the field. There is no surviving species-rich floodplain meadow in this area. But there's a considerable interest now in restoring the system to how it might have been managed in the past.

Katey: We're going to make the presentation available again after the conference, so you all will be able to hear it again. We've gone to the final slide there because I'd like to have some time to get questions in for the previous speakers as well. Unfortunately John can't join us for the quick Q&A but if we could have Antony, Alistair and Martin back.

Questions and discussion

Catriona: Clearly looking at historical maps which is really interesting, it's all obviously about finance and why if the meadows were the most valuable land were they left to belong to the commoners, so someone in the chat suggested that it needed communal effort to mow it.

Martin: Just a couple of things. One is it's partly just economic changes, a shift away. At one time in the Middle Ages when this system of common land use basically fed the country for 1000 years but you got to a situation where the economy changed. Farming became a specialist occupation rather than something that most people did. Therefore you no longer had this peasant economy where everyone in the village needed a hay supply. The other big factor was a change to other ways of providing forage so sown grass leys, various other forage crops and so on that were introduced in the 18th century. Hay just became a much less critical resource for the rural economy.

Catriona: But I thought you said that the meadows were enclosed later than the other land, although you also said that it was the most valuable land or is that talking about different periods?

Martin: Yes it happened at different times in different areas. Some of the SSSIs on the River Ouse were never enclosed. The reason that they escaped agricultural improvement or being converted to arable is partly because they remained in multiple ownership. In other cases floodplain hay meadows were enclosed in the Tudor period and so on. So it just depends on local circumstances.

Alistair: Yes I'd agree with that. I think Lord Egremont in building his navigation the Rother Valley had to compensate meadow users and the commoners for any inconvenience. Sometimes the canal would mean they'd have to build a bridge so that they could reach the meadows on both sides of the banks. So they were still very, very important in the 18th century and people protected their rights and the landowners knew that.

Antony: There's also with the enclosure it's often associated with improvements, so bringing in a lot of capital to improve the land. So we've got instances on the Thames where the common meadows are replaced by constructed bedwork water meadow systems which require a big injection of capital. So that's coming more from private

landowners who then obviously want to take the benefits of that. So you're getting a shift in ownership but also shifts in intensification and injection of capital into the agricultural economy.

Question: I'm interested in the extent to which floodplain meadows were managed as water meadows in terms of having engineering interventions. I was quite struck by the Rother Valley example, that you found that there were quite a lot of quite sophisticated water management systems. I'd always imagined that they were the exception rather than the rule in floodplains but I'm getting to think maybe I've got that wrong. So I'd just be interested to know what you think about that.

Alistair: I think it struck us as well, we were not necessarily expecting to find the level of sophistication in it. But it was slightly different to the bedwork systems that you'd find in the chalk streams, not as sophisticated as that by any stretch of the imagination. So yes there were different levels of water management, but management there was, and to get that flow of water across the meadows just right it was very important so it wasn't going to saturate it and it wasn't going to be too dry. So different floodplains will react in different ways and of course the river itself will be very different from one part of the country to another, so they adapted through trial and error methods of being able to manage the water across it. The Manor, the Reeve of the Manor at Petworth was very much in charge of making sure that the person in charge of the ditches cleaned them out regularly. This was something that had to be done regularly for the water to flow properly. So yes I think I don't think the Rother is atypical at all, I think it's possibly more common that form of water management in those valleys than the bedwork systems of the Avon and Test and others which are exceptionally sophisticated.

Martin: It is also worth bearing in mind that water has been heavily managed for other purposes too as well as for milling. So most rivers from the medieval period, there was heavy interventions in them to manage water levels and route water around the floodplain for milling, and then they're having to integrate that with agricultural activities and various other uses too. So it's important not to see the water management as solely to do with floodplain management.

Alistair: I think during the 17th and 18th centuries there was a lot of experimentation. You've got the agricultural reformers, you've got societies, and journals being produced about agricultural improvement. Bedwork systems and improving your meadows was very much part of that. So there was a little bit of a craze about it where land managers and landowners like Egremont would try some of these things out and sometimes it worked, sometimes it failed. So there was a passion for it certainly during the 18th and into the 19th century.

Martin: In North Yorkshire there's no real evidence of sophisticated irrigation systems. Maintenance of ditches has been mentioned, it was really important. It was

a general obligation upon the inhabitants of each manor and in fact the most common cause of people being presented to manorial court, ie, accused of a misdemeanour, was over failure to maintain the ditches they were responsible for. But there wasn't any sophisticated system for letting water on and off. There's evidence of embankment of floodplain meadows to keep off summer floods from Tudor times onwards, possibly earlier but there's not a lot of documentary evidence of that. Untimely floods were common. There's plenty of medieval records of haystacks floating down the River Ouse through the city of York and that kind of thing.

Katey:.. Just one quick final question from Stewart Clark.

Stewart: What a brilliant session. Thank you all, a really great set of talks and really complementary. Quick question put in my mind by Martin's comment about how valuable hay was. I dabble around the reading history of the Fens pre-drainage and there's a lot of talk about the value of grassland and grazing and you can see these strip structures, but there's nothing that I'm aware of which talks about hay and listening to that conversation it has made me think that actually presumably these would have been managed for hay as well and presumably would have been managed like flood meadows. Does anybody have any views on that?

Antony: So are the Fens being used in the same way? There's more work I would say on the Fens and their management than there is of floodplains. But I think you need to see floodplain meadows in the same light as that management of the Fens, that its being managed heavily, in a sense intensively, for the production of hay. I'm thinking particularly of the Fens work and I think that's very, very similar to how floodplain meadows work all around the country so I think there's a lot of parallels there.

Stewart: Thanks, Anthony. Yes that's the work I was thinking of and I was just checking my interpretation, but it feels like it's the same sort of system. Brilliant.

Martin: Meadows were recognised as a distinct land use and certainly on the boundaries of floodplain meadows, as far as I can see, tended to be fairly fixed over very long periods. That's one of these things that makes these grasslands so interesting is this amazing consistency of management. It could be slightly different in the Fens because that's more generally a wetland landscape. But certainly in historical documents meadows should be recognised as a distinct category of land use as opposed to summer pasture.

Katey: Thank you everybody. I'm going to call a halt to the Q&A session now. We have a lot of questions still in the chat but we'll come back with those after the event. Can I just say a massive thank you to our 4 speakers and hopefully you'll be able to stay with us to join in the next half an hour which is where we are going to come out

to you with a series of 4 questions. We're going to have a short discussion around those and then we'll put a poll to you all. So if we could now move on to putting up the first question please. Has anyone explored the land use history of their floodplain? Now the polls come up already but I'd quite like to have a bit of discussion about that as well. So we've got about 5 minutes here, if anybody would like to come in and tell us about any experience they've had of this. OK, Ann Cantrell.

Ann: I'm working with a farmer on the River Dove just outside Ashbourne on the Staffordshire-Derbyshire border. We are trying to restore floodplain meadow habitat there and we have a small community group that's involved in trying to help us do some of that restoration work. What we've been struggling with actually is trying to find out the history of the site. So we have got some information, but it's very limited. So I'm really looking for advice about how we do that. We don't have any funding to do anything that the speakers have done here, which is absolutely fantastic and amazing. I wish we had more information for our area but I'm looking for advice really about how we can get more information. We know we've got ridge and furrow within the fields, we know that there's lots of drainage systems happening on the site, we presume it was managed as a water meadow, but we're not certain. What can we do to find out more?

Alistair: If you haven't used it already there's a fantastic resource of historic maps held by the National Library of Scotland which shows the historic Ordnance Survey maps. Now even from that, even though the floodplain meadows might have gone, you can still look into the form of the enclosed fields and see instances of those funnel shapes, the general morphology of them, so that can be a help. Sometimes they've already gone but in some cases that does give you at least a clue as to their former existence.

Emma F: Also you could go to your local records office and look at your tithe maps and your apportionment records. They might even be online, some record offices have actually got them digitised. If you're a member of any of the genealogy websites some of those actually have tithe maps. Dorset has all their tithe maps and their apportionment records on there. I know it's not your area, but it's worth looking for those tithe maps for your area, which will be available to the general public.

Katey: Now we'll go to Alison MacDonald.

Alison: I just wanted to say that I was very fortunate in living in Oxford and the local record office and publications were also telling me the history of Port Meadow and that took me back to Doomsday and the records that we've already heard about. So local authorities do have records you can look for. Go to the local record office, especially in the library where they may well have relevant books there.

Catriona: So we're also a fan of Oxford's local history centre. We are working on the patch down from where Antony has worked. That's the area that we're restoring and also working with the local community. What's really interesting is community involvement goes back quite a long way. In the 1930s the WI looked at all the historic field names and have done it on a wonderful kind of tracing that goes over the Ordnance Survey map. Also we're working with the old people in Eynsham and what's interesting and tragic is that the older generation know the old field names. But in the last 40 years they've been lost because the younger generation don't know them.

Alistair: One thing I haven't mentioned that maybe people who have access to maybe to go to Kew to the National Records Office, they have the tithe files which are different to the maps and the apportionments. In these tithe files there's a description by a commissioner of the parish and it's agriculture. Sometimes they can be extremely detailed including the floodplain meadows and it's not really tapped into very much because it's not available at the local record office level, it's available at Kew. You also get the pristine copy of the tithe map and the apportionments. So if you ever get a chance to go to Kew then they have this tithe file data which is very detailed that accompanied every survey that was done.

Katey: Thank you for that. Yes. Interesting. We have the results of our poll in. So 65% of you said No, and 34% of you said Yes. So we'll come back to talking about that probably after the event. Right. Let's go on to question 2 if we can please. So if you've done some work on historical land use research have you used this in an applied way?

Do we have anyone else who might have used this in an applied way? No, I think that's interesting isn't it? It's almost as though we have a gap between doing the research and applying it which is slightly concerning.

Sarah: Just to say the work I do is slightly different. I do historic landscape research primarily on design landscapes, but obviously a lot of them include meadows and that leads into conservation management plans and conservation plans. Often the sites go into stewardship programmes. So it's something I do come across but I have a much more designed landscape background

Catriona: I just want to say that we've used it only so far in terms of community engagement and also landowner engagement trying to encourage people to keep the historic names and often to tell them the historic names so our neighbours at Pinkhill we've found out the historic names of their fields for them.

Simon: As Martin will know I work up in Yorkshire. The historic information I've used I've actually drawn upon some of Martin's work actually, it's very useful as the previous speaker just said in where meadows have fallen out of agricultural systems,

to show people that they were once part of such a system and to help try and get management reinstated. So that historical context can be very useful where a site's no longer part of the agricultural system.

Antony: So I just wanted to say a little bit about the Killerton work. So that's on the Culm which was one of the earlier rivers that we looked at. But there we have floodplain meadows too and we've been able to feed those into the National Trust's Green Recovery Challenge Fund Project there. They've got major work going on in the floodplain there. So we've been able to feed that understanding of the agricultural landscape and the centrality of meadows to that. There's a couple of floodplain meadows there with their funnel shapes, which we can be pretty confident point to 1000 years of hay in the floodplain there and I think that helps even with the reimagining that's going on of floodplains at the moment and saying actually no it wasn't all woods. Meadows were very much a part of that landscape going a long way back is in itself quite an important message to carry across, particularly if you can point to it very specifically. The boundaries in that floodplain are probably the same as they were, I don't know, in 1086. There really is incredible longevity in that landscape.

Martin: In terms of applied use, I think it's helped with the Swale and Ure washlands we'd previously identified fens and calcareous grassland as real priorities in terms of conservation and restoration and doing this landscape history research has kind of like uncovered floodplain hay meadows as a really important characteristic part of the landscape. So that adds a new emphasis that really we just assumed that that habitat hadn't been important historically. So I guess that's an applied use. Restoration of floodplain meadows now forms part of the emerging conservation strategy for the area.

Alison: My applied way was to take the history of the management of floodplain meadows, notice that Natural England was allowing sheep to graze the aftermath of the meadow instead of cattle and setting up an experiment to look at whether there was any difference in the botanical composition of the meadow, and discovered that actually the traditional way produced far more biodiversity than either sheep grazing or no grazing.

Katey: That's a very current subject at the moment isn't it? Right I'm going to move people on to the next slide. So we are thinking of putting together some training resources to help people explore local history of land use on the floodplains. What sort of training resources would be of most interest to you? Here can I ask you to tick all of those that apply. So we've got face to face workshops, online webinars, written advice in a training manual, and case studies showing how others have undertaken their own research. We can have a quick discussion about this if anybody's got anything to say, but it might be that people just want to put things in the poll and we'll

move on to the final question. Please put your hand up if you want to say anything on this.

Looks a bit like everybody wants everything which is good. It's certainly what I've just voted for. There is a lot of discussion coming up in the chat, there's such interesting information there that we just need to all look through again afterwards and links to all sorts of work that's going on, that's very, very useful. Okay, if we have no questions there let's move on to the final question. How might you use historical land use information to inform current and future restoration work? Discuss. Now we haven't got a poll here. We've asked people to put things in the chat. We've got 5 minutes now so we can just have a little chat in person about it if people would like to put their hands up.

Alex: Yes, an absolutely fascinating session and I squeezed this question into the Question Time last night actually but I think it was probably more applicable to this session. It's really thinking about restoration in that temporal aspect in that there seems to be a sense bound up in the word that's a return to something but what are we returning to and why? It's really interesting looking at all the different historical land use sources and it's constrained by what's available, obviously. It's just how we can balance that in terms of not making it arbitrary and deciding what information is there, what's useful and why it's useful. It would just be fascinating to hear people's views on that.

Alistair: It's an interesting point that. When we were interpreting the map evidence and all the information it doesn't necessarily tell you about the condition or the quality. We know that when we looked at the tithe map data we were surprised by several things. One was the greater extent of arable land than there is today. The other part of it was that through the historical records, there was terrible problems with sediment in the river. It wasn't all good news despite the water meadows there was still huge amounts of sediment in the river. So the pattern of the land use and looking at all these different systems, you need to look a little bit deeper to see were they working efficiently? I know that the fish counts in the Rother, according to the Egremont were very, very low, it wasn't worth fishing. So they kept their fish in the hammer ponds. So in some cases in the 19th century they were battling against the same problems as we do today. So there's looking at the records, looking at the maps and, of course, that's not complete. But then there's the interpretation of it and the deeper qualitative aspects of the analysis as well. I hope that sort of gives you some feedback on that.

Antony: I think that's a really important point particularly at the end there is that this gives you another layer, it gives you another line of insight, and it's a really important one, a really valuable one, but it doesn't provide all answers by itself. All those other constraints are still there, whether you can get access and ownership, you've got someone who wants to get involved in that kind of thing. But it is a really important

strand to draw in that there is, in effect, so much knowledge about how the landscape was managed still embedded within that landscape if we are prepared to look for it and I think that's a really valuable point to take forward. But there's no silver bullets.

Alison: I'm writing a book to try and encourage other people to look at their own landscapes by going back as far as I can to describe how vegetation changed and how it was influenced by the human people.

Susan: On the old Ordnance Survey maps that I've looked at, parts of the meadows that we own, a very small part, are listed as osier beds and I wondered if our history experts could tell me a bit more about that.

Emma: So the osiers are the withy beds so they are basically willows that are being harvested and pollarded each year for basketmaking and that kind of thing. They would have been managed woodlands adjacent or near the rivers and they would have had their own irrigation systems which would have kept them wet. So obviously the trees grow well, but they are actually part of a managed landscape.

Antony: Just again to emphasise these resources are really important. There was a really wide range of things, pre-plastics, you are using a lot of natural resources, and so they will be again really very valuable.

Martin: Managed osier beds were a really common use of the floodplain. Baskets were essential items. Often they were located in quite specific positions, so at the junction of ditches and so on. So a very interesting historic feature. I think they go alongside the meadows.

Susan: So it could be part of restoration.

Katey: Thank you all and with that I'm going to close this session. Thank you very much to our speakers and for them coming back and taking part in our Q&A session which is very helpful.