Floodplain Meadows Partnership NEWSLETTER

www.floodplainmeadows.org.uk

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July 2009

Welcome to the Floodplain Meadows Partnership newsletter number 3! We are pleased to say that with the survey season nearing the end, we have completed all of our 1328 quadrats. See more on page 2. We take a look at restoration projects from around the country, and summarise 4 great events that we have been involved with this season. Phew....time to put our feet up!

The 2009 survey programme has now been completed, with conditions being a lot more favourable for survey than last year. Botanists have been donning sunhats and insect repellent rather than wetsuits and snorkels. This bodes well for the 2009 hay cut, and perhaps some of those meadows that suffered last year as a result of the floods, will manage to get back on track.

Within the team, we have said goodbye to Ellie Sargent, who was in post whilst I was away on maternity leave. She has done a fantastic job keeping things on the boil, and we wish her the very best in her future career. She is currently completing her PhD write up on the non-chemical control of marsh ragwort, as well as helping with some of our events and carrying out some survey work.

In this issue, we have a large spread on restoration projects from around the country, summaries of the events we have been involved with this year, and the latest research from the partnership. Look for **dates for events next year**, and let us know about your local events. We may be able to help.

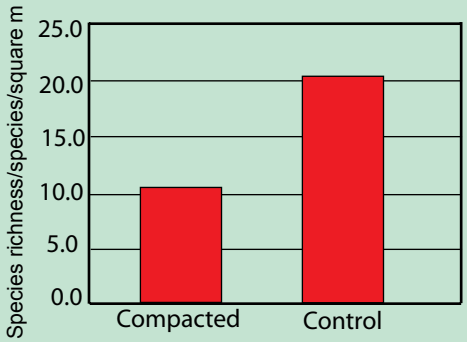
I would also like to thank all contributors to this newsletter edition. If you would like to contribute to the next edition, please get in touch.

Say Hi to Martha-the new Floodplain Meadows Partnership poster girl.

To cut or not to cut? That is the question!

Many of you will have found yourself having to face this quandary in the last two years with those two wet summers making it very difficult to get machinery onto your meadows without a risk of damage to soil (and hence risk of species composition change). However, there is also a penalty to not cutting, because leaving litter on the soil surface can lead to a reduction in species richness the following year. So when is it too wet and at what point do you throw in the towel? We have been carrying out some research into effects of compaction on species richness, and the graph shows that they can be very significant. Watch this space for further analysis of the data and hopefully some specific guidance on how wet is too wet.

Effect of compaction on grassland species richness
Compaction caused by trafficking two years prior to sampling



The 2009 Survey Season

Hilary Wallace, Floodplain Meadows Partnership Research Co-Ordinator

The field survey season is now well advanced with our target to repeat 1328 monitoring quadrats completed. These quadrats are surveyed each year to track changes in species composition and richness and link these changes to annual variations in climate and management activities. Using Total Station, or GPS technology, the quadrats are placed in exactly the same position each year (to within 3 cm).

Surveys at Cricklade, (200 locations were recorded for their 12th year in succession) and Elm Lea (3rd year of recording with comparisons to mid-1990's data expected this winter) are complete. Long term monitoring at Oxley Mead and Mill Crook is now in its 10th year and plots established at Portholme last year have been revisited. Repeat surveys of the Oxford Meads, New Marston Meadows, Fancott, Mottey Meadows and West Sedgemoor are now complete. Monitoring of the management trials at East Cottingwith and Wheldrake has continued. On the Oxford Meads, Portholme, East Cottingwith, Cricklade and Mottey Meadows we have also collected soil samples to assess the impact of the 2008 summer flood on soil nutrient levels.

In addition some new work has been undertaken. At Clifton Ings (Yorkshire), an NVC survey was carried out to help guide a management trial next summer with the co-operation of the EA and local landowners. New data have also been collected from Woodside Meadow (Wendlebury Meads SSSI, Oxon) and an NVC survey of Sherbourne Meadows SSSI (Warks) has been completed.

A number of site visits have been undertaken at the invitation of site managers. These included the Sturts and Lugg Meadows (Herefordshire Wildlife Trust) and Upham and Summer Leasow Meadows (Gloucestershire, with Natural England). As a result, we have submitted a proposal for the Herefordshire Nature Trust to seek funding for a trial aimed at reducing rush and sedge growth in favour of grasses to improve hay quality and quantity on the Sturts. At Upham Meadow in Gloucestershire, we discovered more relict MG4 grassland and it is hoped HLS funding will allow restoration work to start here soon. We finished the season with visits to east Wales (with Stuart Smith, CCW) and the Peak District (with Audra Hurst, NE and Rebekah Newman, Peak District National Park).

Some early findings

Although we have not analysed all the data yet, there seem to be some trends that are of concern. Many sites were not cut in 2007 and some areas on these sites were also left uncut in 2008 due to the wet conditions. On North Meadow, Cricklade, it appears that areas left uncut for a single season are showing some recovery in species-richness whilst those areas left uncut for two consecutive years continue to show a decline in numbers. The species that are increasing in the uncut areas vary across the sites. Interestingly, at North Meadow, one area left uncut at the dry end of the MG4 spectrum has shown a dramatic expansion of *Arrhenatherum elatius* (false oat grass) whilst in wetter areas *Filipendula ulmaria* (meadowsweet) has increased. On the Derwent Ings, and elsewhere, large sedges have continued to expand, notably *Carex acuta* (slender tufted sedge) whilst on the Somerset Levels *Carex disticha* (brown sedge) appears to be expanding again.

Thank you

I would like to take this opportunity to thank everyone who has been involved with the field survey this summer, to survey over 1300 quadrats across 11 sites requires good team work. In particular Mike Dodd and Irina Tatarenko for ensuring that canes are always set out on site before the botanists arrive and Emma Rothero for making sure landowners are always expecting us. The team of field surveyors have had better weather this summer, but all still worked very hard so thanks to Irina Tatarenko, Mike Prosser, Frances Kirkham, Sarah Lambert, Ann Fells, Ellie Sargent and Owen Mountford. Finally, a big thank you to all the farmers and landowners who have allowed us to tread delicately through their hay yet again.

A day in the life of North Meadow NNR Seasonal Warden

By Anita Barratt, Natural England

This will be my 4th season at North Meadow NNR. My position as Seasonal Reserve Manager runs from April to July and every season on the reserve is different which makes my job more interesting each year. The meadow is famous for its large population of *Fritillaria meleagris* and the meadow in full flower during April is certainly one of those sights that must be seen to be believed.

Over four weeks in April and early May the meadow is visited by around 5 to 6,000 people all keen to see the mass flowering. During this time I run a series of guided walks taking groups of 20 or more on an easy walk, about 2.5 miles around the main path. The open expanse of 110 acres of lowland hay meadow on a cold windy day in early April certainly keeps you on the move and you quickly learn to keep your back to the wind when delivering the information to the tour group. There are organised guided walks over three Open Weekends run by Natural England, Cricklade Court Leet, Cricklade in Bloom and this year for the first time The Floodplain Meadows Partnership; I take many other groups, schools and youth groups on walks or even help the local junior school with their sketches of the Fritillary flowers.

My days are long over the flowering season; many visitors arrive early, particularly photographers who look like they are going to set up camp, and some do! But not for long as I have to request that they keep to the marked footpaths. Most visitors do keep to the paths but there is always the odd one or two that wander into the meadow to see a certain Fritillary flower, not thinking about all the plants they are crushing on their way in. The visitors certainly keep me busy and I enjoy the interaction and exchange of knowledge that comes with talking to so many people.

Five 10 m x 2 m fixed quadrat location points were set up on North Meadow in 1986 and annual fritillary monitoring has been carried out by the seasonal warden each year during the peak fritillary flowering time. A condition assessment is carried out in early June and vegetation height survey recorded in April, June and October.
Before the hay crop gets too tall it's necessary to mark all the ancient boundary stones and old bridges that are scattered throughout the meadow with marker posts. These stones are still used to define compartments of hay but many of them are now too small to be easily seen from a tractor.
All too soon the Fritillary flowers have been pollinated and have cast aside their chequered petals, visitor numbers fall and I can get on with other maintenance work on the reserve.

News in Brief

Funds

We recently secured £15k from the Environment Agency as a contribution towards the workshop, re-design of the website and the production of an FSC fold-out chart.

We secured £22k from the Aggregates Levy Sustainability Fund to trial soil-water modelling in predicting restoration communities (see Science Corner for results).We followed this up with a further bid with Natural England looking at modelling and restoration of fields around North Meadow, Cricklade, and the Oxford Meadows. At this stage, we are not sure if that funding will be awarded or not.

Two new PhD Students

The Partnership has been awarded funds by the Open University to sponsor a PhD student to look at the effects of meadow management regime on its species composition. The work will involve analysis of our huge database (>15,000 quadrat records) plus some additional data collection. We have appointed Jim McGinley to take up the post in October. Jim has an MSc in Environmental Science from Nottingham University and has worked in environmental consultancy for several years, so has all the necessary experience to take on the challenge.

We have also just been awarded a Charter studentship by the University. This will be a full-time PhD studentship for three years looking at problems with aggressive species in meadows. Under the title: "Rehabilitation of floodplain-meadow diversity through environmental control," the studentship will be looking at the ecological processes that lead to the loss of diversity in such cases and subsequent recovery.

Guided walk amongst the fritillaries

This year the FMP attended one of the Open Days, and put up posters showing the results of some of our data collected on Cricklade in the Fritillary Tea Rooms. We helped with the guided walks, handed out information and enjoyed talking to people about our project.

RESTORATION PROJECTS FROM AROUND THE COUNTRY.

One of the Floodplain Meadows Partnership objectives is to promote restoration of meadows. We are increasingly coming across projects that have already started restoration and it is clear that there are different methods being used. We have been encouraging these projects to monitor their results in a standard way so that we can all learn from them. I thought it would be useful to summarise some of these exciting projects from around the country. We will also be putting a series of more detailed case studies on the website over the summer.

A restoration project on former arable land using seed from Emorsgate.

Meadow Creation at Upper Heyford, Northamptonshire; Dr Robin Field, River Nene Regional Park CIC
For more information please see www.riverneneregionalpark.org

Funding was secured from Natural England's Higher Level Scheme for Mr & Mrs Banner, Dovecote Farm, Upper Heyford, Northamptonshire to create 13.5 hectare (33 acres) of wildflower meadow next to the Nene Way and River Nene at Upper Heyford. The site was historically a wet meadow but was converted in the 1970s to arable production. Over the last couple of years the site has been flooded on numerous occasions and in 2007 the final arable crop was harvested with great difficulty.

In April 2008 the site was sown with a range of native species from the seed company Emorsgate. A new hedge divided the site along an old boundary, with the lower part of the meadow being sown with the EM8 meadow mixture for wetlands and encouraged to develop into MG4 grassland (Meadow foxtail – Great burnet). The upper part of the meadow was sown with the basic EM1 meadow mixture and should develop into a drier wildflower pasture. The meadows are now in flower for the first time in nearly 40 years.

The site is being managed in a traditional way with half being cut for hay (lower half) and then grazed by cattle, while the upper half is now being grazed by native Hereford cattle. The area is crossed by the Nene Way, a footpath from Upper Heyford, and a new 400m path has been created alongside the meadow and the River Nene to join a byway from Upper Heyford and the road to Nether Heyford.

The Northamptonshire Wildlife Trust have agreed to monitor the development of the meadows as this creation project is important both locally (for future meadow restoration/creation on the River Nene and River Ise [Revital-ISE project]) and nationally as part of the creation/restoration and management for the Floodplain Meadows Partnership. The landowners are also carrying out a butterfly transect on the site and recorded 8 species including the Small Copper, a grassland specialist, in their first week.

Before sowing (RNRP).

Before sowing in flood (RNRP).

The results one year on (Heather Ball; Beds, Northants, Cambs & Peterboro Wildlife Trust.)

A restoration project from arable using green hay from an adjacent NNR.

Chimney Meadows National Nature Reserve, Oxfordshire.
Dr Kerry Lock, Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust Chimney Meadows Site Manager www.bbowt.org.uk/reserves/chimney
Objective: to evaluate the success of green hay spreading as a restoration management practise for the re-creation of species rich grassland on ex-arable land.

The local Oxfordshire BAP aims to create some 400 ha of species rich grassland before 2010, and the arable reversion project at Chimney Meadows Nature Reserve is one of the largest restoration attempts in the country, aiming to create 70 ha of floodplain meadow.

In 2004, green hay was spread onto 8 arable fields with the aim of introducing seeds harvested from Chimney Meadows National Nature Reserve (MG4 species rich floodplain meadow). Green hay was cut from 35 ha of the NNR and spread within 6 hours onto the receptor site. A double chop harvester cut the hay into 5 cm sections and then blew it onto a tractor drawn trailer. The green hay was then transferred to the recipient fields and piled. A grab transferred the hay into 2 tractor drawn muck spreaders with rear-mounted beaters, which spread the hay across the field at a ratio of 1:2 donor to recipient site. The spread hay was finally rolled.

To test for the effects of this technique, green hay spread plots were paired with control plots (30 x 30 m) where no seeds were added.

The control plot within an area where hay was spread

Subsequently all fields were topped (April/May) to cut back the competitive grasses. Thereafter, traditional management of a July/August hay cut followed by sheep aftermath grazing was implemented.

Plant species composition, vegetation height, invertebrate assemblages and bird densities were all monitored.

Restoration success was assessed by comparing the similarity of the plant communities in the control (no hay spreading) and treatment (hay spreading) to those of the existing species-rich floodplain grassland NNR (the target for restoration management). Similarity to the target floodplain grassland community was both greater where hay spreading management had been used, and also increased between 2005 and 2007. Additionally the similarity of the control plot to the target grassland also increased over time towards the target community at the same rate as the treatment. This can be explained quite simply as the control being colonised by seeds from the remainder of the reversion field.

This trial has proved that hay spreading is an effective tool for over-coming dispersal limitation during the restoration of species-rich floodplain grasslands, at least in the case of the plants. A good quality meadow can be established within 3 years using this method.

The restored meadow after 3 years

In the future, we hope to continue with our monitoring, as well as looking at the invertebrate data, sward structure, nutrient and grazing data in a multivariate analysis to evaluate the community structure in response to reversion management. We would also like to contrast quantitative data before and after the 2007 flood to look at its impact on species loss, and to look at species colonisation in light of increased future flood frequency.
For more information on Chimney Meadows, please see www.bbowt.org.uk/content.asp?did=23539

A restoration project on a low diversity existing sward spread with seed harvested using a brush harvester from nearby meadows.

Claire Cornish, Hay-Day, Cumbria Wildlife Trust. www.cumbriawildlifetrust.org.uk

Hay-Day, Cumbria's hay meadow project, is in the process of evaluating the success of a restoration undertaken last year. 5 ha of meadow (two fields) were restored on a farm near Orton, which lies on the limestone in east Cumbria. The farm business is run under a new Higher Level Stewardship scheme which includes the restoration of four meadows through addition of native seed. The fields restored were historically recorded as supporting Upland Hay Meadow, subsequently lost to agricultural improvement.

Pre-restoration surveys show a low diversity sward dominated by Common bent with Crested dogs tail, Yorkshire fog, Meadow buttercup, Common sorrel and some Ribwort plantain. The combination of low phosphorous (index 0) and low cover of competitive species (Perennial rye grass, Creeping buttercup, White clover and Yorkshire fog) indicated the site could have high potential for restoration.

Different methods of scarification were trialled including the use of a pin harrow and both single and double passes with a power harrow, the latter creating the most extensive seedbed. Seed was collected with a brush harvester from a species rich upland hay meadow in Grayrigg, 10 miles away, dried and spread within 10 days. The fields were rolled, and cattle grazed the aftermath once it had fogged up.

A series of walkover surveys this year seem to show that seeds on the areas which had the most extensive areas of bare ground are the earliest to germinate, while those on areas with a more closed sward germinate later and the frequency of species is lower. The most common new species are the annuals, Yellow rattle and Eyebright, while Red clover is also more frequent than before seed addition. Cover of white clover also appeared to be higher, perhaps exploiting the bare ground left by cultivation.


Escaped pig feeding on pignuts in a meadow earmarked for restoration

In 2009 we have an ambitious target of 15 ha for restoration, divided between four farms and involving eight fields. Nine donor sites are being matched as closely as possible to the restoration sites for pH, soil wetness, altitude and phosphorus – though a pragmatic approach has to be adopted due to the scarcity of good weed free donors. Seed is often mixed from two or more sites to ensure enough rattle or late flowering species are incorporated where necessary. We are also considering increasing the amount of seed spread per hectare to help ensure a higher frequency of introduced target species, as it is unlikely that more seed will be added at a later date.

Nearly all our restoration focuses on Upland Hay Meadows as this is the most common type in Cumbria. While many meadows are situated in floodplains, most are too impoverished to be identified as Floodplain Meadows MG4 at the moment.

We have identified that the fine-tuning of management of meadows is very important – if time allows the Project Ecologist will visit the farm managers of our best meadows to attempt to unravel common themes that help to maintain these lovely grasslands.

Restoration of species-rich floodplain hay meadows from semi-improved grassland in the Upper Ray Meadows Nature Reserve (Buckinghamshire) with some soil disturbance.

Dr Arnaud Duranel, Upper Ray Project Officer, BBOWT

The River Ray is part of the Upper Thames tributaries, flowing a few miles north-east of Oxford, at the border between Buckinghamshire and Oxfordshire. It has a broad, flat floodplain with very clayey soils and frequent winter floods. The area has retained a significant number of species-rich floodplain hay meadows; however they are generally small and fragmented. The recreation of a large network of this habitat at the landscape scale is therefore one of the main objectives of the Ray Valley Restoration Project, led jointly by the Berks, Bucks & Oxon Wildlife Trust (BBOWT) and the RSPB.


Disc harrowing on restoration site before green hay spreading.

Given the scale of the restoration project, spreading green hay harvested in local species-rich hay meadow is likely to be the most cost-effective technique. Using this technique, BBOWT successfully restored 70 ha of species-rich hay meadow from arable land in its Chimney Meadows Nature Reserve (Oxon); however the Ray area presents new challenges as most of the potential restoration sites are improved or semi-improved grasslands. In this situation, established grasses are indeed likely to out-compete seedlings of introduced species. Recent research (Edwards et al., 2007) suggests that green hay spreading can work in existing grasslands, but that its effectiveness is increased by some soil disturbance.

This is the method that we have chosen to restore 30 ha of existing semi-improved grassland over 3 years in the Upper Ray Meadows Nature Reserve. Last year, we started the restoration of a 10 ha field. The receptor site was first disc-harrowed very lightly, with the aim of creating patches of bare soil covering around 30% of the total area. Green hay was then harvested from a local species-rich hay meadow using a mower and a forage harvester; and spread onto the receptor field using muck-spreaders. The field was then rolled, and aftermath grazed as usual.

A before-after-control-impact monitoring scheme was set up to study the effectiveness of the project at restoring plant and terrestrial invertebrate communities. The first data coming in seem to show that green hay spreading only has been effective at establishing Yellow Rattle with a very good cover. However, green hay spreading seems much more effective when associated with disc-harrowing, with species like Great burnet, Black knapweed, Ribwort plantain and Lesser hawkbit establishing in the disturbed plots only.

A.R. Edwards, S.R. Mortimer, C.S. Lawson, D.B. Westbury, S.J. Harris, B.A. Woodcock and V.K. Brown, Hay strewing, brush harvesting of seed and soil disturbance as tools for the enhancement of botanical diversity in grasslands, Biological Conservation 134 (2007), pp. 372–382.

This years events (see page 9 for details of next years events)

Floodplain Meadows Workshop. The first one!

We ran our first workshop in May. The workshop was aimed primarily at site managers and owners and we had received some funding from the Environment Agency to help subsidise places. We ran the course at the Preston Montford Field Studies Centre, and with the help of the Field Studies Council partners, it was a very successful event. We had attendees from organisations including wildlife trusts, local authorities and Natural England. We had a good geographical spread of representation including bodies from Yorkshire, Worcestershire, Berkshire, Buckinghamshire, Oxfordshire, Nottinghamshire, Bedfordshire Cambridgeshire, Cumbria, Wiltshire, Lancashire and Northamptonshire.

The workshop started on Monday with a summary of the science and research that the Open University has been carrying out from David. We then had a quick look at soils and a lesson from Hilary on identification of key plant species in the field. The day ended with an excellent presentation from invited speaker Dr Ben Woodcock on invertebrates of floodplain meadows. He highlighted the importance of meadows for invertebrates and the difficulties they have in re-colonisation of restored sites.

In the evening we had a discussion on our monitoring protocols- how to build and install a cheap dipwell, set up a cheap and repeatable botanical and hydrological monitoring programme and how the FMP can help. We also talked through a plant grid that we are devising to help use indicator species in identifying the state of your site.

On Tuesday we spent a day in the field at Mottey Meadows SAC and NNR, carrying out botanical survey on the different plant communities, taking soil samples and battling with a deluge of rain. We talked about management issues in the evening.

A wet day in the field

The final morning was spent looking at case studies, with invited speaker Ellie Sargent talking about non-chemical control of marsh ragwort. Case studies on the impact of cutting/not cutting on species richness and issues surrounding soil nutrients. We analysed a soil sample. The morning was finished off with a talk from Dr Arnaud Duranel from BBOWT (prepared by Dr Kerry Lock from Chimney Meadows NNR, who was unable to give the presentation herself due to a diary clash) on a very successful meadow restoration project at Chimney Meadows (see page 3). This resulted in a very useful discussion on restoration techniques.

David demonstrates how to analyse soils for P content

During the workshop, we invited suggestions for tools that would be useful. Some suggestions included a sheet showing what to write down/note about a site and what data is needed when planning a restoration project and the sharing of information via the website and leaflets, with case studies, practical advice, and information.

We had some excellent feedback and suggestions on what we could do to improve the course. As a result, we are planning to run a similar course next year, aimed at professionals working with floodplain meadows. The content will be similar but tweaked and hopefully we will have some new tools to test and use. Watch the website and the next newsletter for details, but provisional dates are **28th-30th June 2010**.

OU Unlimited

We ran an event for the Open University Open Day this year. We set up camp on the meadow within the campus and ran a short activity. We asked members of the public to count the numbers of Creeping and Meadow buttercup, and Yellow oat grass and Meadow foxtail in two different plots. We recorded the findings and demonstrated that the species separated out into the ridge and furrow habitats within the meadow. Many people who went into the meadow said they had a lovely time watching the butterflies and moths and identifying the flowers. We took over 100 people round our event and engaged with many more talking about the project.

Clifton Meadows and Rawcliffe Ings (York): an example of multi-targeted outreach events by a great local partnership.

by Sue Penn, Biodiversity officer, Environment Agency. sue.penn@environment-agency.gov.uk.

This June we organised a weekend of events to highlight the city's floodplain meadows, known as 'ings', some of which the Environment Agency owns and uses for flood storage. We were lucky enough to be joined by staff from the Floodplain Meadows Partnership, as well as other partners including York City Council, Friends of Rawcliffe Meadows (a voluntary group who manage part of the meadows) and Natural England.

Our first event was a **FWAG (Farming & Wildlife Advisory Group) walk** around the meadows for land managers, with experts including Prof David Gowing together with Hilary Wallace and Mike Prosser from Ecological Surveys, Bangor (botanists carrying out work on Clifton Ings). Our focus was the 110 acres of meadow known as Clifton Ings, one of York City Council's 'local wildlife sites' (although its MG4 grassland is considered to be of SSSI quality). Its ownership is muddied by the waters of time. York City Council is thought to own the land but the hay crop that grows on it belongs to a clutch of people including the Church Commissioners and a couple of locals, so getting everyone's agreement to apply for Higher Level Stewardship (HLS) is tricky.

Landowners walk along the floodbank overlooking the meadow

Without HLS funding it is hard to achieve sensitive dock control (a major issue at Clifton) – the lack of height differential in the meadow means that weed wiping is not an option, and spot spraying is expensive. Other matters discussed were the increased incidence of summer flooding resulting in damage to, or complete loss of, the hay crop; the possibility of obtaining a premium for hay taken from these herb-rich meadows and siltation of drainage gutters by natural river processes. Any advice welcome!

My Flood Risk Management colleagues outlined the use of York's floodplain meadows for flood storage – the area is technically a reservoir - and the steps the Environment Agency is taking to tackle flood storage on a river catchment scale.

Members of the public enjoy the meadows

The second event was a series of **evening presentations** followed by day time guided walks to the local community. Emma Rothero spoke about the work of the Floodplain Meadow Partnership – Emma's animated slide of a cow adding its nutrient contribution to the meadow went down particularly well! Also presenting was York City Council's Countryside Officer, Bob Missin. Bob mentioned the multiple uses of the meadows. Lying only one mile north of York Minster they are well used for cycling, walking, the occasional bit of arson, and so on.

The **guided walks** focused on the identification and ecology of the hay meadow flowers and historic aspects of the meadows. We looked at the fantastic restoration work carried out by the Friends of Rawcliffe Meadows since 1991, when they began to bring back many of the meadow species lost to overgrazing by cutting twice a year, and at a restoration field where we removed topsoil for riverbank repairs, and strewed green hay last year. We had people from the local community on the guided walks who had never walked around the meadows before, despite living within a mile of the site.

This year we have commissioned the Open University to do a baseline survey of the botanical and hydrological condition of these meadows which will allow us to make informed management decisions.

If you'd like to know more you will find a leaflet about the Clifton and Rawcliffe Ings Meadows on the Floodplain Meadows Partnership website. Also see the article in the Yorkshire Post 26 June www.yorkshirepost.co.uk/farming-news/fertile-ground-for-debate.

Science Corner- Modelling the soil-water regime for restoration

Kat Wotherspoon Floodplain Meadows Partnership Post Graduate Research Assistant,
Prof. David Gowing, Floodplain Meadows Partnership Director

During the period from December 2008 to March 2009 a study was carried out at Cricklade North Meadow NNR and Oxford Meadows SAC to investigate the soil water regime to determine the potential expansion of a species-rich community onto surrounding sites, by characterising the suitability of the soil. The study was funded by the Aggregates Levy Sustainability Fund.

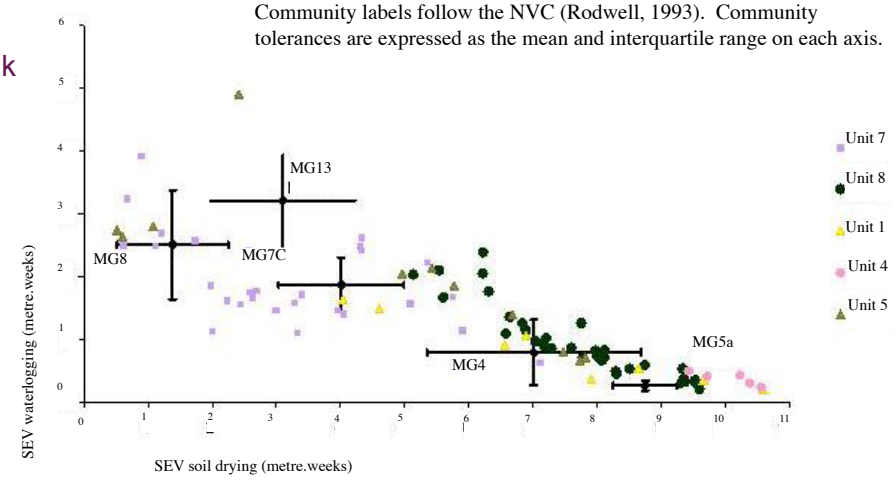
Hydrological modelling techniques were used to simulate the water-table at 94 points in 5 hydrological units surrounding North Meadow. This involved using meteorological data and river stage levels as input parameters. Water-table height outputs could then be used to predict the plant communities that would be favoured by that soil water regime. Figure 1 shows the water regime of all 94 points in the units surrounding North Meadow, which is superimposed on the preferred regime of each community to illustrate the potential meadow vegetation that may could occur in each unit following restoration. Points in the bottom right of the plot represent well drained dry soils, and points in the top left indicate waterlogged soils. The model was validated using water-table data from dipwells installed at the site, however further validation data is required in the units where dipwells are currently absent (1, 4 and 7).

At Oxford Meadows SAC, a range of modelling approaches are required as opposed to the single model adopted at North Meadow due to the variability in soil depth and permeability across the site. Based on the results from this study, a full soil-water model needs to be constructed in order to assess the restoration potential of the site.

Soil samples were also taken at each site from the top 10 cm of the profile to measure available phosphorus and pH as these can be a constraint on species richness. The values for available phosphorus found around North Meadow were generally below <30 mg kg-1 and therefore in the range was considered acceptable for restoration of species-rich grassland. The concentrations around Oxford SAC were also generally well within the normal range for MG4 and therefore the potential restoration sites have good prospects for supporting a species-rich community.

The full report is available on the website www.floodplainmeadows.org.uk

Figure 1. Water-regime tolerances of grassland community types found. Community labels follow the NVC (Rodwell, 1993). Community tolerances are expressed as the mean and interquartile range on each axis.



STOP PRESS EVENTS NEXT YEAR

We have some pencilled in dates for events next year.
A one-day conference in March aimed at anyone involved in or interested in floodplain meadows. This will be held at the Open University conference facility in Milton Keynes.
A second professional workshop. Two days at Preston Montford Field Centre 28th-30th June 2010.
A weekend on the Social and Natural History of Meadows aimed at amateur naturalists at Preston Montford , Shropshire 11th-13th June. There will be more information about these events on the website as they are finalised. if you are interested in any of them, please let me know and I will ensure you know further details when they are available.
If you are planning any floodplain meadow community events and would like us to be involved, please get in touch.