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Welcome to the Floodplain Meadows Partnership Summer 2012 newsletter. The big issue this summer is of course the rain, so see pages 2-4 for an article on cutting hay in wet summers. An update on our Flight of the Fritillary project is on page 5, and what have the Bumblebee Conservation Trust been up to with a Bumblearium (page 7)? A snakeshead fritillary DNA project is summarised on page 6, and two unusual sightings this year on page 8...

Many thanks to all our contributors

This year has seen a similar programme of survey to last year with the added problem of the weather (too too wet), a twisted knee and a broken leg (two of our students and nothing to do with being on a meadow).

We re-visited our regular long term plots on the SAC sites at Portholme, Oxford, North Meadow, Motte Meadows and the two sites in the Lower Derwent Valley (East Cottingwith and Wheldrake) as well as some of the other sites on which we have long-term sampling points including Oxley Mead, Mill Crook, Ducklington and Fancott. We surveyed a number of restoration sites including Priors Ham (Cricklade), Clattinger Fam (green hay spreading), and Motte Meadows ex-pasture site. We re-visited Chimney Meadows quadrats first set out in 2004, and helped the Staffordshire Wildlife Trust set up a monitoring transect at Seighford Moor.

The big issue this year has been the atrocious weather...too dry for too long and then too wet and still too wet. Most people have not managed to cut their hay yet, and there is little prospect of it being cut by beginning August. See our article on page 2 about how to deal with wet summers and managing the consequences of not cutting hay at all, or cutting it very late in the season. One positive thing about the long spell of dry weather was that many sedge patches had started to recede and particularly where combined with a double cut. We have seen sedge invasion reduce somewhat across the country. This wet summer will probably reverse this trend however. Sonia Newman is currently writing up her PhD findings on mechanical control of invasive sedges and we will report more about this when she has analysed her data.

We also embarked upon a survey of MG8 sites in a bid to update the NVC, as highlighted in the Summer 2011 newsletter. Hilary Wallace has been all over the country surveying new MG8 sites and collating data from previous surveys, and will start analysing the data in the autumn.

Finally many thanks to all landowners and managers for allowing us onto your sites once again and thanks to our hardy team of botanists, cane setters and soil samplers! We are very grateful.



North Meadow under water in late spring



a million voices for nature



**The Light
Owler Trust**



**The 29th May 1961
Charitable Trust**



Make hay when the sun shines (but what if the sun don't shine?)...

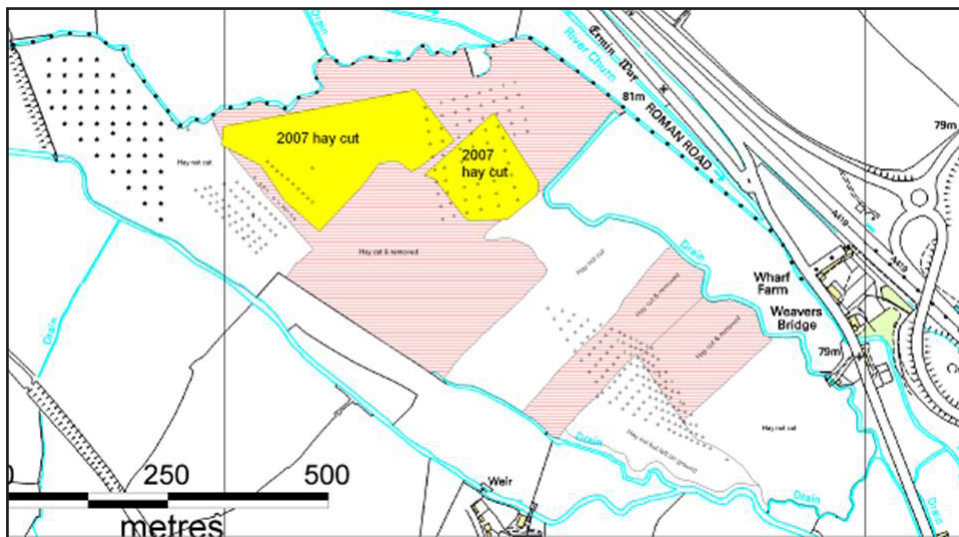
With the wettest June since records began under our belts, and early July continuing in the same vein (groan), what happens to our floodplain meadows when the sun doesn't shine for long enough to make hay? We wrote a short article about this in the Winter 2008 newsletter, but four years down the line and another wet summer under way, we thought it would be a good idea to update this article with latest data, and provide some tips on how to deal with the resultant problems.

Meadows exist because of the hay cut followed by grazing, both of which remove tree seedlings and stop woody vegetation developing on the floodplains. The diversity of the sward has been created by the annual hay cut which prevents domination by a few coarse species.

Meadow plants, especially grasses and sedges produce a lot of litter by the middle/end of summer if they have not been cut. The litter prevents germination of the seeds and development of the seedlings of many species and also has an effect on soil temperature and moisture. Similarly, hay left on the meadow after it has been cut has a very similar effect as litter on uncut areas. Species diversity declines sharply on both. Further spring/summer floods bring additional nutrients causing production of bigger vegetation biomass and more litter if hay can not be cut.

You should not cut hay when the soil is too soggy to support the agricultural machinery as the risks of soil compaction to species richness are too great, plus hay cut onto wet ground rarely makes well. Therefore in the summers of 2007 and 2008, a lot of sites did not have their hay cut at all, were cut very late, or were cut, but the hay was not removed. These are common problems faced in these conditions by many hay meadow managers. Our advice would be: if your soil is too wet to make hay, then leave it until it dries out; if it doesn't dry out (such as in 2008,) then just let the animals (preferably cattle) into the field as normal in August/September and let them eat the hay crop.

We have been monitoring North Meadow, Cricklade for many years now, and the summer floods in both 2007 and 2008 presented us with an ideal opportunity to monitor what happens in different cutting scenarios following a summer flood.



- hay cut in 2007
- hay cut in 2008
- hay not cut in either year
- *** location of permanent monitoring quadrats

East Cottingwith Ings (Yorkshire) in June; the meadows are wet and cannot drain as the river levels are too high



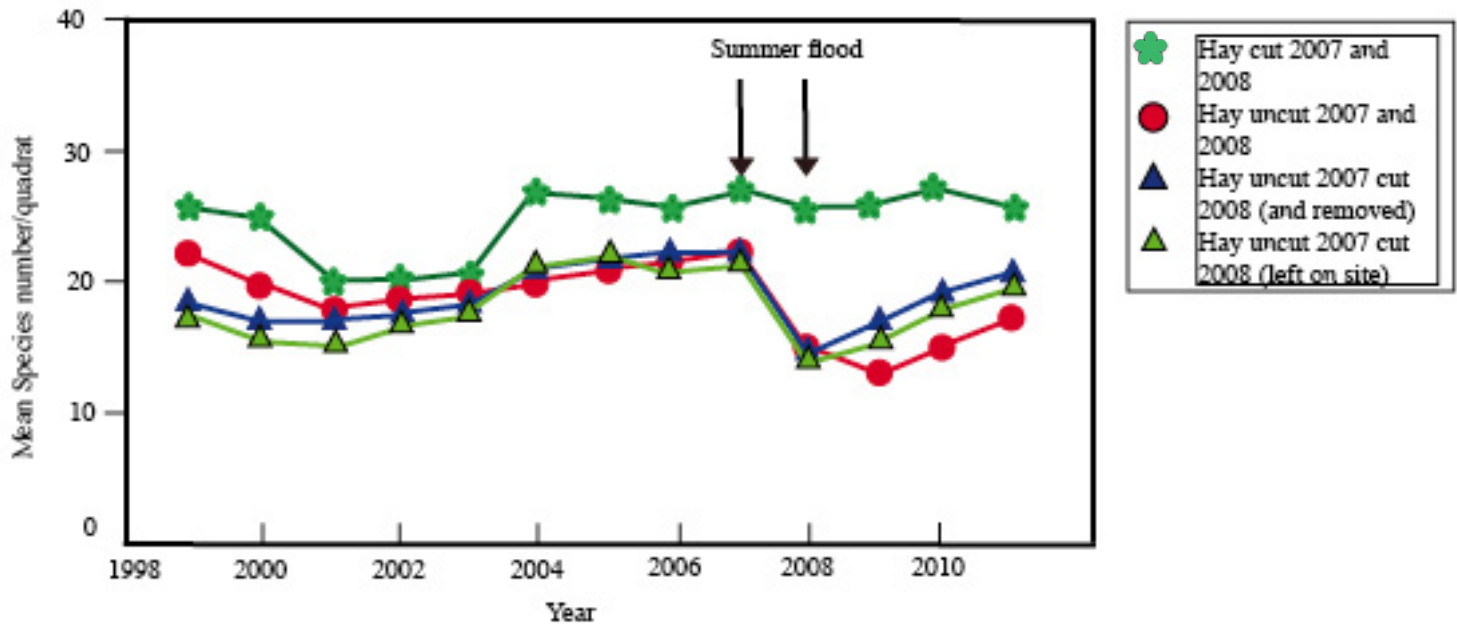
This analysis is particularly interesting as Natural England keep very detailed management records on this site, enabling us to overlay their management data with our botanical, hydrological and soils data.

Management data from North Meadow

The summer flood events of 2007 and 2008 prevented much of the hay crop from being cut and removed from site. The map opposite describes the different cutting patterns that happened across our 4 blocks of quadrats (320 quadrats in total).

So you can see from the management map that we have botanical data over several years following several different cutting patterns.

Graph 1. Plant species richness in relation to hay cutting pattern at North Meadow NNR, Cricklde highlighting the 2007-08 summer floods



The rate of decline and subsequent recovery in species richness appears to be closely linked to hay management in 2007 and 2008. Where a normal hay cut was taken in both years, the species richness only showed a small decline in 2008 and started to recover in 2009 (green flowers). Areas that were uncut in 2007, but cut in 2008 showed a greater decline in richness in 2008 (blue triangles), whilst those areas that were left uncut in both years continued to decline into 2009 (red dots).

Species richness is still lowest in the plots that were uncut two years in a row. The data are currently being analysed to see whether the main drivers for this continued slower recovery in areas uncut for two years are to do with nutrient increase as a result of hay not being removed from site, or the effects of shade cast by the dominant species when left uncut on the more diminutive members of the community.



Big Sedges

One of the things that was noted following the 2007 floods was the expansion of large waterlogging-tolerant sedges, most notably lesser pond sedge *Carex acutiformis* and slender tufted sedge *Carex acuta*. These species tend to become dominant to the exclusion of other meadow species, are not easily digested by animals and are therefore not desirable in hay. Whilst a range of the smaller sedges form part of the typical flora of a floodplain meadow, these larger sedges do not. Sonia Newman has been studying mechanical methods for control of these sedges for her PhD and she is due to finish this year. It looks like two cuts a year are reducing the vigour of the sedges in her experimental plots (either in May and late June or late June and July). Watch this space for more info when she starts to publish papers on her findings.

So, what should you do in a wet summer (like this one)?

- Stating the obvious, cut as soon as you can if the weather, soil conditions, machinery availability and time allow.
- Cutting later in the year and removing the arisings is better than not cutting at all especially if combined with a prompt hay cut the following year.
- Cutting and leaving the hay, or just topping is little better than not cutting at all, so always try and remove the arisings if you can, even if it can't be used as feed for stock.
- If there really is no option to cut the hay at all, then turn stock out as normal in August/September and let them graze off the hay crop.
- Manage the nutrient balance by taking a prompt hay cut the following year (mid/late June) and possibly a second cut if the weather works in your favour, in August.
- Look carefully at the drainage infrastructure. You need to be able to get flood water off the site as soon as possible after a flood recedes. If the site can dry out quickly, you are more likely to be able to take a hay cut. Water sitting around for long periods in the summer, making the soil anoxic, killing flood intolerant species and encouraging unwanted species will neither help maintain the species richness nor the value of the hay crop.
- Think about floodplain meadow restoration nearby. As the article about Chimney Meadows in the Winter 2011/12 showed, their restoration site will prove vital if they are to use it to spread green hay back onto the National Nature Reserve, so damaged in the 2007 floods.

Lesser pond sedge
Carex acutiformis



Flight of the Fritillary

Our bid to increase the number of sites on which snakeshead fritillaries are counted is underway, with two new sites started up this year and a corresponding group of fritillary and bee surveying volunteers at both. On the Lugg Meadows, Herefordshire Nature Trust ran an open day with activities for children and guided walks around the meadow, whilst we started the counts. The weather stayed dry after a very wet start and it was an excellent day - our thanks to the HNT for such a well organised event.

Two weeks later, Clattinger Farm (Wilts) was, by contrast, soaking wet. A team of very hardy volunteers worked valiantly and we finished the count by lunch time! At North Meadow, we had our biggest turn out yet, with 50 people to help. The data are currently being digitised by a willing and able student. I hope the weather has not put off new volunteers....surely it will be better next year?

The bumblebee surveys are well underway. We are, however short on numbers at Clattinger Farm in Wiltshire. So if you thought you had missed the boat, there is still plenty of opportunity to get involved. Please contact us if you want to join in the bumblebee transects. We are learning our ID as we go, but are happy to share what we have gleaned with all comers.

So far we have found that May was not very good for bees; it was probably too wet to get good records. June was much better with lots of sightings at all 3 sites (we were lucky the days we went out that the weather was mostly fine). The team even found a southern cuckoo bumblebee (*Bombus vestalis*), which is a rare sighting. We have found plenty of buff/white tailed bees (*B. terrestris/B.lucorum*) that are hard to distinguish and quite a few red-tailed (*B. lapidarius*) and common carder bees (*B. pascuorum*).

We have been using the excellent iSPOT website to help with ID where we are not sure - all you do is email a photo to the website. There are a number of experts who can help with ID across a range of species groups. It really is very good: www.ispot.org.uk.

So if you are interested in surveying bumblebees on your floodplain meadow, or joining in with our surveys, it really is easy. Contact us on Floodplain-Meadows-Project@open.ac.uk; and don't forget, we will be running both the bumblebee transects and the fritillary counts next year, so there is plenty of time to get involved!



A great turn out at North Meadow (Wiltshire)

Mike Dodd



A red tailed bumblebee found during one of the surveys



Peter, an intrepid bee surveyor.



A snakeshead fritillary made by one of the children at the Lugg Meadows open day



The new group of volunteers on the Lugg Meadows learns how to carry out the fritillary count

A line of volunteers at North Meadow



Fritillaries and cowslips at Clattinger; this is what it is all about!



Volunteers braving the appalling weather at Clattinger Farm (Wiltshire)

Mike Dodd

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The two articles on these pages have arisen due to links made through the fritillary project. First, Dr Maureen Berg travelled round with us in April collecting samples of fritillaries for DNA analysis in her bid to answer the question below. Second, the Bumblebee Conservation Trust have just launched their 'Bees for Everyone' project and were very helpful in establishing our volunteer bee survey groups. Gill Perkins tells us more about their work.

How genetically diverse is our snakeshead fritillary population?

In recent years, huge effort has been invested into monitoring and surveying those remnant populations of Snake's Head Fritillary, to understand their dynamics and general ecology. About 75% of the remaining MG4 fragments are less than 10 hectares in extent (BRIG, 2007), leaving *F. meleagris* populations fragmented and isolated at multiple scales. This isolation of population questions their genetic viability. How genetically diverse are these remnant populations and how could this affect their adaptability to environmental changes? With more extreme weather events, flooding and periods of drought, do the remnant populations have sufficient genetic resilience to overcome those climatic changes? In addition, it remains unclear whether *F. meleagris* has native or introduced status within the UK (Preston, Pearmann & Dines, 2002; Pearman, 2007), and this could be answered using DNA-based studies.



To be able to answer these questions, it was essential to gather genetic material that would later be purified and analysed at the University of Brighton. So this April, while participating in the annual count, I also collected 30 leaf samples from three sites. These leaves were stored and preserved for later analysis, but a few are currently used to develop microsatellites. Microsatellites are small repeated sequences in the DNA, and these repeats will be used to help assess the genetic variability of *F. meleagris* within the British populations. In a later stage (next year hopefully), European samples will be collected and the study will address the phylogeography and determine the genetic differences between UK and continental European populations.

For further information please contact Dr Maureen Berg, University of Brighton.

The tale of the flower meadow in a box and the wooden bumblebees

Gill Perkins, Conservation Manager
Bumblebee Conservation Trust

This year, for the first time, the Bumblebee Conservation Trust exhibited at Hampton Court Flower show. We formed a partnership with the British Beekeepers Association and the RHS who were launching their Perfect for Pollinators range of plants.

Bumblebees are charismatic, interesting creatures and the opportunity to show off the work they do and how they do it to vast audience was too good to miss, so we engaged the services of Nick Mann of Habitat aid and his.....Bumblarium.

The bumblarium, 'a huge fish tank type thing' with a wildflower meadow in it and a nest of bumblebees in one corner, it provides a close up view of bumblebees working, in a wild flower meadow. Or this was the plan. It took about 5 hours to construct on the Sunday before schools day on the Monday.

The beautiful wildflower turf was provided by James Hewetson-Brown of the Wildflower Turf Company (<http://www.wildflowerturf.co.uk/>) in Hampshire and it needed to be soaked to ensure it did not dry out during the week in the bumblarium.

First mistake. I sauntered in on Monday morning to find a bumblearium with its own climate of fog and condensation, you could just about see the bumblebees as they made 'snail trails' on the inside of the Perspex, the oxeye daisies peeped out above the 'low cloud'. Disaster was averted by the kind donation of a fan by the BBC, who made great cracks relating to incident - the Bee Bee C to the rescue, etc. Happily with a few modifications to the bumblearium we were able to clear the condensation in time for the children to see the flowers and bumblebees.

The bumblearium provided a real draw to children and adults alike and it caught the imagination of many who were keen to understand how they could grow a wild flower meadow similar to the one featured in the bumblearium.



We have recently introduced a series of fact sheets to help landowners and farmers with the management of wildflower meadows and we were delighted that golf clubs, schools, hotels and a various other landowners were interested in developing parts of their land for wildlife and in particular wild flowers. (Information on all our factsheets can be found on our website, they are all downloadable. <http://bumblebeeconservation.org/get-involved/managing-your-land/wildflower-meadows/>).

Part of our three year funded project '**Bees for Everyone**' is also to educate; about conservation, land management and of course Bumblebees themselves. So we have made six wooden bumblebees each representing a different species of bumblebee. For children this proved to be a fantastic way of developing interest and enthusiasm for bumbles, (in case you are concerned, the bees from the bumblearium are now happily in my garden pollinating my veg).

More information and pictures:

<http://www.facebook.com/pages/Bumblebee-Conservation-Trust/184323594931922><http://blog.habitataid.co.uk/hampton-court-flower-show/>.



Some unusual sightings this year...

Two things have sprung up this year that we were not expecting.

Firstly, we are undertaking a study with the Milton Keynes Parks Trust to survey all the land that they hold that may have some grassland interest or restoration potential. The report will be used to guide an HLS application, so we are carrying out botanical surveys and taking soil samples.

During the survey we found a number of very nice sites, and quite a few with the uncommon meadow saxifrage *Saxifraga granulata* (above). The sites where it was found may well have been seeded in the past, but there are no records to show what has been done, so we can only guess at this stage. More will follow about this peice of work once we have fully analysed the findings.

Secondly, whilst our botanists were surveying at West Sedgemoor, Somerset, they were treated to a fly past by flocks of Cranes!! Perhaps these will be a more common floodplain meadow sighting in the future?

The Great Crane Project told us that the cranes released onto the Somerset Levels and Moors have been using a mixture of habitats to forage, but summer sees them favouring species rich hay meadows. The abundance and diversity of insect life and seeds in these meadows is so high that the cranes Hoover up the grasshoppers, spiders, moths, bugs, and insect larvae. In time, it is hoped that these meadows will provide vital feeding areas for growing crane chicks. Yet another 'great' reason to restore these fabulous meadows! To find out more about the Great Crane Project visit <http://www.thegreatcraneproject.org.uk/>



Mike Dodd



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