



# BREAKING NEWS

## ESMÉE FAIRBAIRN FOUNDATION GRANTS US THREE MORE YEARS

Yes, we are very very excited to be able to say that the Esmée Fairbairn Foundation has confirmed three years funding, to start in January 2019. The focus of the next three years of our work will be a further Ambassadors phase, developing our work on restoration and a new Advocacy Officer to work directly with Government

Alongside this, we also have two new PhD studentships being advertised, funded from elsewhere, who will be researching areas very pertinent to appropriate delivery of land management schemes and soil carbon processes (subject to getting a suitable candidate).

So, come and work with us over the next three years through one of these exciting opportunities:

**1. Phase 3 of the Ambassadors programme.** Applications now open, deadline 25th January 2019. More information here <http://www.floodplainmeadows.org.uk/content/phase-3-ambassadors-training-launched>

**2. Two new PhD Studentships.** Applications now open, deadline 12pm (noon) on 21st January 2019. See page 7 of the newsletter for more information.

**3. New FMP Advocacy post.** Details not yet available, but if you are interested, please get in touch. This post will be offered at an attractive pay scale. We want to work with someone who already has significant advocacy experience with Government and Defra if possible. Timescales are short, and we need to work quickly to make any impacts.

**4. Floodplain meadow restoration.** Are you thinking of initiating a floodplain meadow restoration scheme, but not yet been in contact? We would love to hear from you. No deadline for this one, but we only have three years of survey seasons, so get in touch.





# BREAKING NEWS

## FMP Ambassadors Phase 3 launched

Are you feeling like you need to develop your skills and specialisms and want to expand your horizons? Are you a floodplain meadow manager or volunteer wishing to learn more about their site and share this with others? Do you want to help protect and restore one of the UK's rarest habitats? Do you want to become part of a network of likeminded individuals who can support each other and share experiences? If your answer to any of these is yes (or you may have a myriad of other reasons), then our Phase 3 Ambassadors training could be for you!

We are very pleased to be able to launch the third phase of the FMP Ambassadors programme. During the first two phases of this vocational training programme, we have continued to refine the structure and content of the course, so this third programme should be our best yet!

**The application window closes on 25th Jan 2019.**

More information about the training programme and how to apply can be found here:  
<http://www.floodplainmeadows.org.uk/content/phase-3-ambassadors-training-launched>

More information about our existing Ambassadors can be found here:  
<http://www.floodplainmeadows.org.uk/about-us/fmp-ambassadors>

Previous Ambassadors said:

‘Hilary and David did a really good job of distilling very technical information for beginners and intermediates alike. It was clear that we represented a range of different skills and experiences, many of which were greater than mine, but I never felt lost which must be a good sign’ Sam Thomas, Environment Agency

‘Monthly tasks were a very good approach to take. Easy to sell to your manager in terms of time commitments. Some months the task took only a couple of hours, others a few days, but it all evened out over the 24 months’. Helen Carty, National Parks and Wildlife Service, Ireland

‘Nothing beats seeing other people’s sites and putting your own into context.... Learning never stops and this is a great way to do this’ Debbie Lewis Bucks Berks and Oxfordshire Wildlife Trust

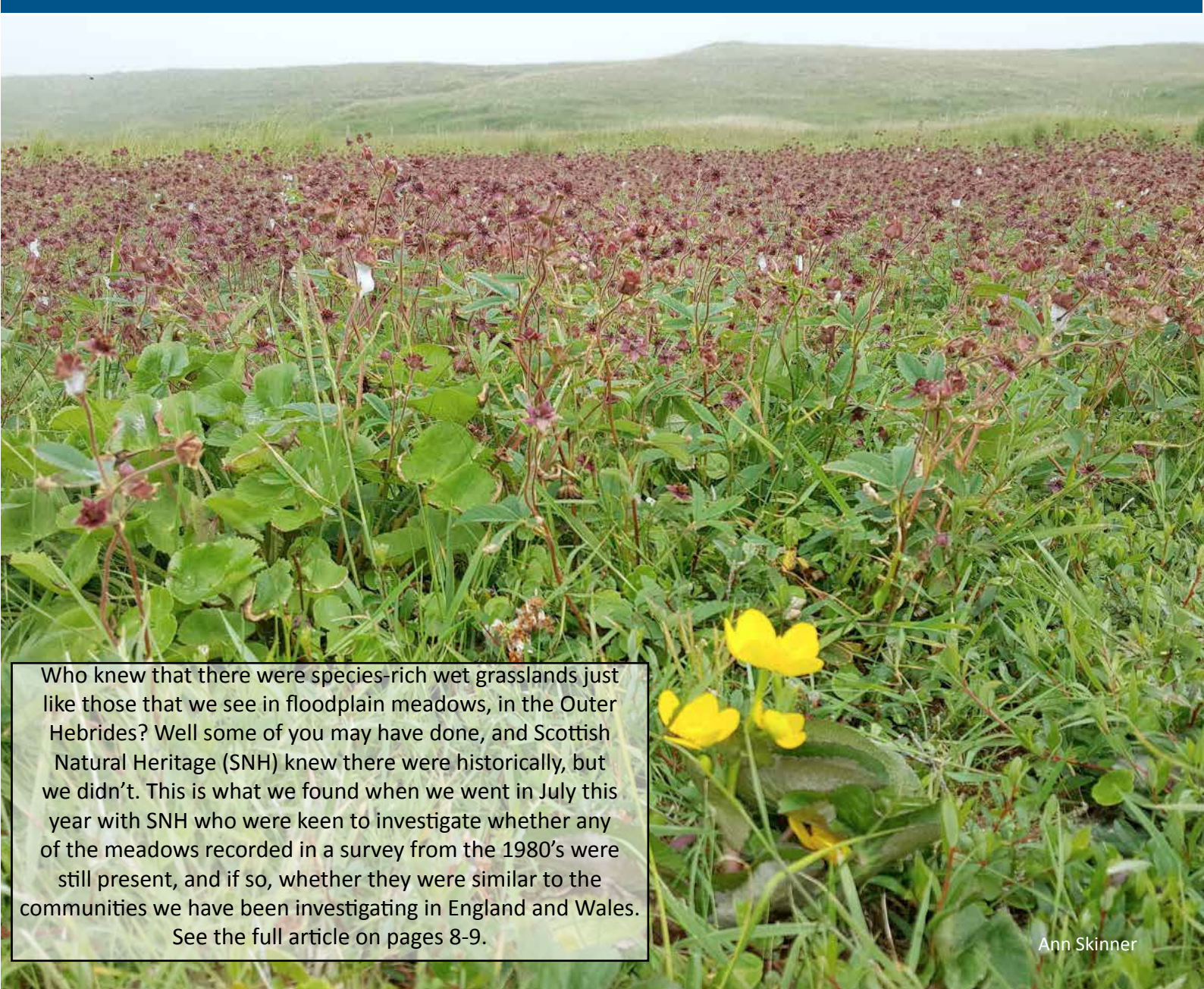
‘I thoroughly enjoyed writing the report as it brought together all the data collection and analysis into something informative and useful for future management of the site’ Ellie Jones, Wiltshire Wildlife Trust

‘It is nice to have another hat to wear, which is organisationally neutral, rather than just wearing the Natural England hat. And being associated with a national network – FMP – carries more weight than just be a ‘local resident’ or even a ‘local expert’’. Cath Mowat, Natural England

‘Yes, I think the EA already has started to benefit from the knowledge I’ve gained. During this period the EA has recognised the importance of floodplain connectivity and prioritised natural flood management so it has really been beneficial for my work’. Jane Birch, Environment Agency



**Welcome to our Autumn 2018 newsletter. It feels like we have been even busier than usual this year, in particular finishing up some major pieces of work and then starting new ones. So find out how our floodplain meadow restoration visits have gone (we are now writing up the 3 years' worth of survey and discussion with landowners) on pages 2-4. Keep up with two of our PhD students, Laura and James looking respectively at Irish Turloughs and Natural Flood Management in the Thames floodplain on page 5, and see information for a new PhD studentship with us on page 6. Read more about where this amazing photo below was taken on pages 7-8. Finally, this Autumn has seen the launch of our paper on natural capital of floodplains, find out more on page 9.**



Who knew that there were species-rich wet grasslands just like those that we see in floodplain meadows, in the Outer Hebrides? Well some of you may have done, and Scottish Natural Heritage (SNH) knew there were historically, but we didn't. This is what we found when we went in July this year with SNH who were keen to investigate whether any of the meadows recorded in a survey from the 1980's were still present, and if so, whether they were similar to the communities we have been investigating in England and Wales. See the full article on pages 8-9.



# The state of floodplain meadow restoration in England and Wales.

## How does it look, are you involved and what are the pitfalls?

As a result of a 3 year grant from the John Ellerman Foundation, we have been able to visit 194 sites (174 new sites plus 20 long running restoration sites already known to us) where there have been restoration attempts for floodplain meadow systems. We have written about this project in several of our newsletters over the past 3 years and earlier this year presented the findings from the first year of the project at the Aspects of Applied Biology conference in Worcester. The conference proceedings paper published from this conference is available here:

<http://www.floodplainmeadows.org.uk/content/latest-paper-floodplain-meadow-restoration-1>

However, we have now completed the surveys and written our final report for our funder. We are now analysing the data in more detail in order to find trends and patterns, so we can share these with you!

Table 1 and Fig. 1 show where we have been and how much botanical information has been collected. For each site visited, we have written up our discussions with the landowner/manager, and our findings, and shared these with the landowner/manager. These 'case studies' are being added to our webmap as we get permission to do so (blue dots are restoration case studies on the webmap).

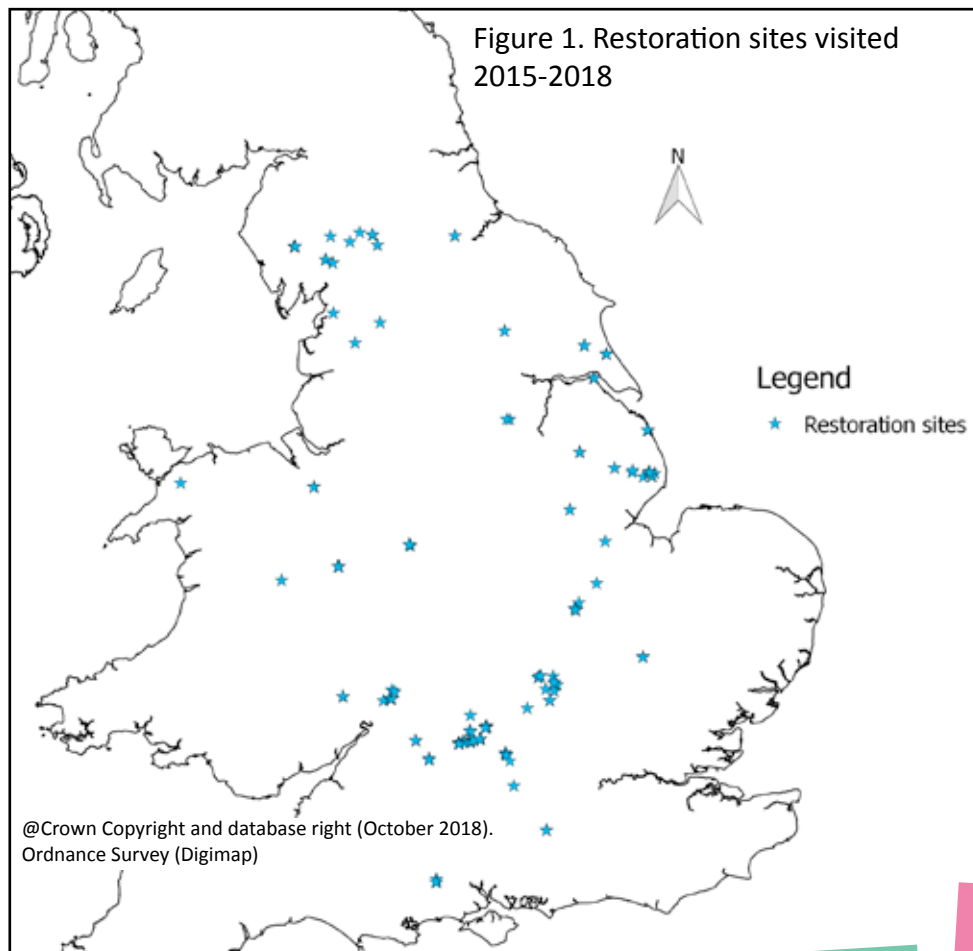


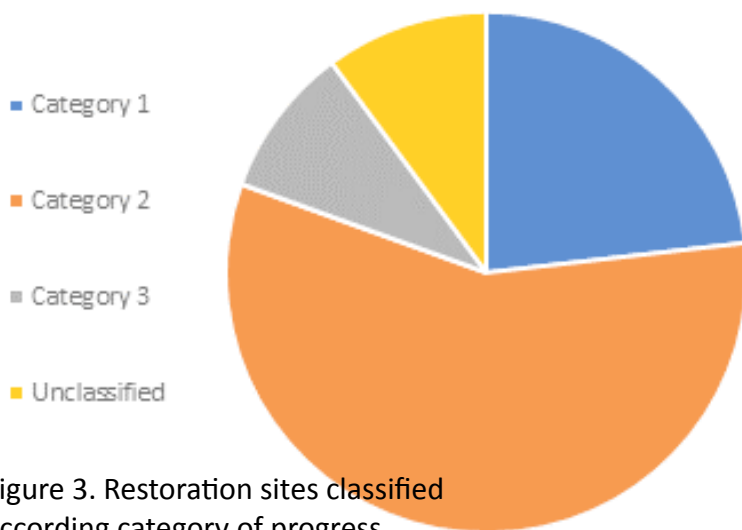
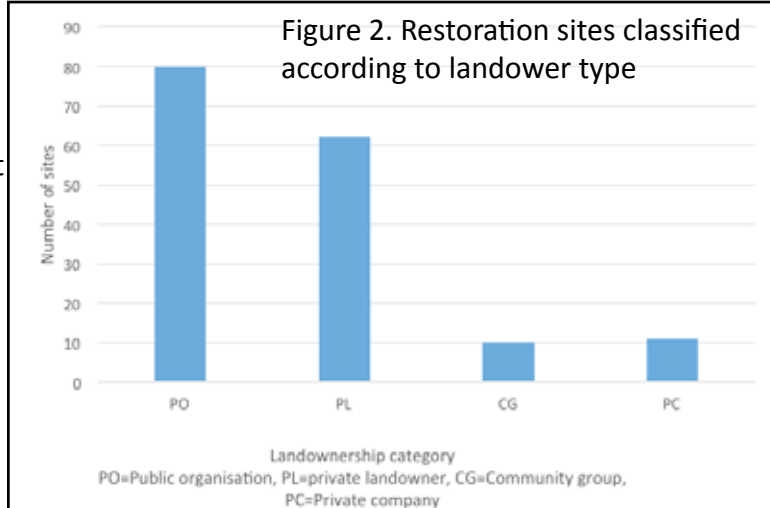
Table 1.	New sites	Sampled quadrats
Berkshire	2	10
Buckinghamshire	4	10
Cambridgeshire	2	10
Cumbria	17	68
Gloucestershire	10	27
Hampshire	4	20
Herefordshire	2	15
Lancashire	3	15
Lincolnshire	22	74
Oxfordshire	56	180
Northamptonshire	14	32
Shropshire	4	15
Staffordshire	4	30
Surrey	2	10
Yorkshire	15	521
Wiltshire	9	55
Wales	4	10
Totals	174	1102

There are at least 842.2 ha of floodplain meadow being restored in England and Wales. There are estimated to be 2980 ha of existing species rich floodplain meadow remaining so this is a significant contribution.

However, of this, 195.2 ha (23%) are considered to have failed, 482.9 ha (57%) are making some progress and 78.9 ha (9.4%) making good progress. The remaining 10% are uncategorised.

As Figure 2 shows, the majority of the landowners are public organisations (e.g. Wildlife Trusts, other charities, government organisations), but a significant minority were private landowners (individual farmers), with two other categories of private company and community group.

We allocated each restoration site a category to indicate progress (category 1-start again, 2 -making some progress, 3-making good progress). Figure 3 below shows that the majority of the sites fall into category 2, but a significant number (25%) fall into category 1, and only a small number (10%) fall into category 3. Unclassified applies to sites that we have not visited recently enough to assess their progress, but are aware that they have had some restoration effort. The distribution of the sites by their categories across the country is shown in Figure 4.



We also looked at reasons for restoration failure, or reasons why a site might be making slow or poor progress. These findings are still in draft, but currently, high nutrients appear to be the main reason why sites are failing to become more species rich, with waterlogging, unexpected occurrences (e.g. untimely flooding) and lack of follow-up management also contributing.

Figure 3. Restoration sites classified according category of progress

### RESTORATION TOP TIPS

**Find out your soil fertility**  
If it is high, make sure you are cutting the hay by the end of June, or take double hay cuts for 2-3 years to maximise nutrient off-take.

**Get management sorted before you start**  
Make sure you have arrangements in place to take prompt hay cuts in the years immediately after sowing.

**Know your water levels**  
If soil conditions are too wet, compared to the seed source, then many of the seeds will either fail to germinate or will not survive for long after germination.

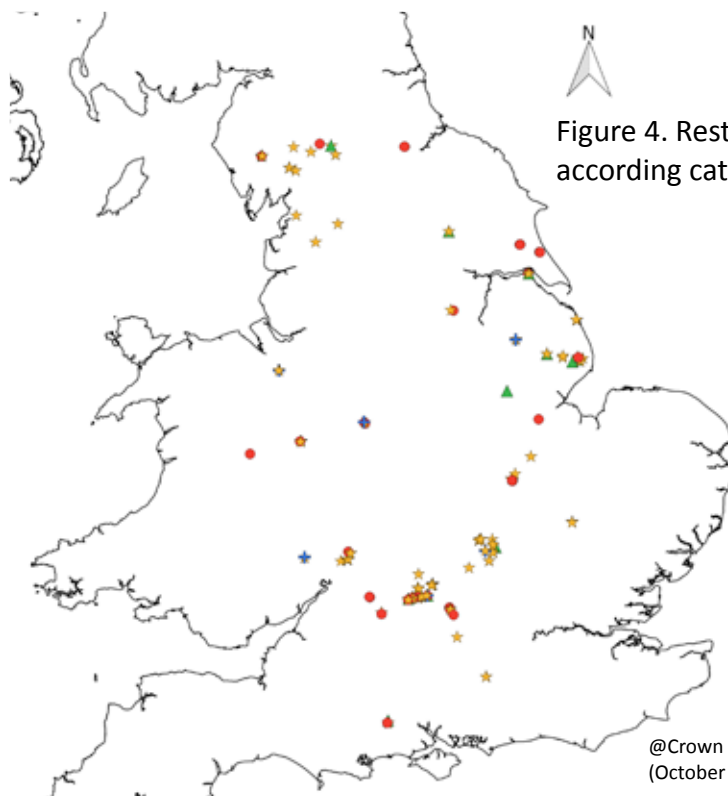


Figure 4. Restoration sites classified according category of progress

**Legend**  
Restoration category  
 ● 1 - Very little or no progress  
 ★ 2 - Some progress  
 ▲ 3 - Good progress  
 + 4 - Donor sites

@Crown Copyright and database right (October 2018). Ordnance Survey (Digimap)

**Manage your expectations**  
Development of a species rich community even remotely similar to extant sites takes a long time.

**Check the weather forecast**  
If there is a high chance of flooding soon after or during when you are spreading hay/seed, consider postponing.

## Some lessons so far

1. Restoration sites, especially newly formed, are particularly vulnerable to lack of management.
2. Vegetation on restoration sites is dynamic
3. The total number of species increases very slowly
4. An increase in the evenness of species distribution across the site should be taken as a major measure of restoration success.
5. Despite the fact that meadow plant species are fast-growing, the actual time for them to assemble into an established meadow community is much longer than anticipated in any restoration plans.
6. Species diversity largely depends on the success of the initial restoration effort. Not all the species from the seed mixture/green hay establish themselves successfully after the first application. Those which succeed usually remain on the site. However, no/very few new meadow species arrive to 'restored' plant communities by themselves, even in cases where a good meadow is situated next to the restored site.
7. As a result, we can't expect species diversity to grow rapidly and significantly within a few years, it might take decades.
8. It is possible to achieve a significant species diversity from the first restoration effort, but conditions of the site, seeds, weather and following management need to be right. As so many factors affect conditions on the floodplain, it is not always possible to get a significant species diversity in a newly establishing community. Repeat applications of seed increase the likelihood of establishment.

A very short profile - less than 50 cm to the gravel layer. The soil over the gravel layer is nicely structured with a good depth of organic material. This is from a restoration site along the Thames and supported a really nice developing meadow. Well structured soil is free draining, full of invertebrates and organic material, and this profile is in connection with the gravel layer to supply water in the summer, and facilitate drainage in the winter.



9. One of our indicators of restoration success has been similarity to documented NVC communities. This works well, but it has limitations, and should be applied and interpreted very critically in each particular instance.

## 10. Restoration takes TIME!

### Some cool soil profiles - and what they tell you



A clear divide between the overlying alluvial clay and the underlying peat. This suggests that drainage patterns changed in the past, from a constantly wet soil (allowing peat formation) to one that dries out but receives regular flooding (resulting in deposition of alluvial clay).



Fine red sandy soils found in Herefordshire along the Wye and into Wales. These are deep, well structured soils with no gravel layer by 1.2 m. They enable free drainage after floods, yet also facilitate some groundwater movement upwards during the summer. Despite their very free draining nature therefore, they can still support some moisture demanding species.

## The Eco-hydrology of Irish Turloughs



One of our PhD students, Laura George, visited Ireland this August for her 7th and final field trip! Laura is studying the eco-hydrology of turloughs – these are groundwater-fed, seasonal wetlands, which occur on limestone karst almost exclusively in the west of Ireland. Turloughs are floodplains too, but of underground rivers, and they contain some similar species assemblages to our meadows, which makes them a useful comparison. But importantly turloughs are hydrologically distinct and more variable than meadows, so we can add to our existing knowledge on the links between hydrology and plants. Laura's preliminary findings show a strong link between the plant community zonation of turloughs and their highly variable water levels, and she will be presenting her findings at the British Ecological Society Annual meeting this December in Birmingham.



Laura George

James Latham



## Assessing the Natural Flood Management contribution of different land use types in the Thames floodplain.

James Latham is our PhD student working on NFM in the Thames floodplain. He has been looking at sites around the area as potential study sites. This photo was taken from a National Trust site, where he went to meet the Countryside Manager for the estate and to look at the current land uses there. The estate has soil types that are representative of the rest of the Upper Thames catchment and is therefore ideal for studying the impact of different land uses on the same underlying soil type. The main purpose of the visit was to understand the topography of the land, as well as confirming the current land use. This will be compared against the CEH Land Cover Map to determine the accuracy of the dataset at a smaller scale, so that the confidence in using this dataset on a catchment scale can be determined. He was also wanting to understand the parts of the estate that have had land use changes in recent years and to look at those areas in more detail. He will return in November to undertake a baseline soil structure survey and to take soil samples for lab testing.



# Two new brilliant PhD opportunities with the FMP and the OU

## 1. Floodplain-meadow management in a changing environment

This is a brilliant opportunity to work on a CASE studentship, an industry supported research project, which gives the best students an opportunity to undertake a PhD whilst working with industrial partners, developing a wide range of skills to take to future employers.

This PhD will consist of:

- Field trials of conservation-management relevance in a rare and threatened habitat
- Working with a range of end-users
- Interdisciplinary approach informing nature-conservation policy

Training and skills acquired include CENTA2 Training Credits (CTCs), botanical identification skills, laboratory skills and statistical analysis skills.

The industrial partners (FAI farms, Berks, Bucks & Oxon Wildlife Trust and The Milton Keynes Parks Trust) will each supply the land for experimental work and will be centrally involved in the design and management of the experimental treatments.

To find out more and to apply see <http://www.open.ac.uk/science/environment-earth-ecosystems/sites/www.open.ac.uk.science.environment-earth-ecosystems/files/files/O8%20Gowing.pdf> and <http://www.open.ac.uk/science/environment-earth-ecosystems/phd-studentships/how-apply>

## 2. Response of meadow species assemblages along a hydrological gradient and impacts on the movement and fate of carbon in the plantsoil system.

This PhD will consist of:

- Research on the coexistence mechanisms in species rich meadows using hydrological and microbiological methods
- Contribution to the understanding of the linkage between biodiversity and hydrological gradient
- Exploration of the fate of carbon in species rich meadows along a hydrology-biodiversity gradient

The study would aim to explore the link between biological species composition and the flows of carbon to and from the soil and the resulting impacts on carbon sequestration by investigating the species response, carbon balance and resilience of multi-species plant assemblages to imposed hydrological change. This will be done through both mesocosm experiments and field trials.

More information about this PhD can be found here:

<http://www.open.ac.uk/science/environment-earth-ecosystems/sites/www.open.ac.uk.science.environment-earth-ecosystems/files/files/O2%20Araya.pdf>

**The deadline for applications is 12pm (noon) on 21st January 2019.**

Information for applications for both PhD opportunities here:

<http://www.open.ac.uk/science/environment-earth-ecosystems/phd-studentships/how-apply>





# Species-rich wet grasslands in Scotland

In the first week of July 2018, the Floodplain Meadows Partnership (FMP) held our annual Steering Group meeting with site visits on the Outer Hebrides. The aim of our meeting was to familiarise ourselves with wet meadows (including those on machair) of the Uists and Benbecula, and compare their composition and ecology with related habitats further south in the UK.

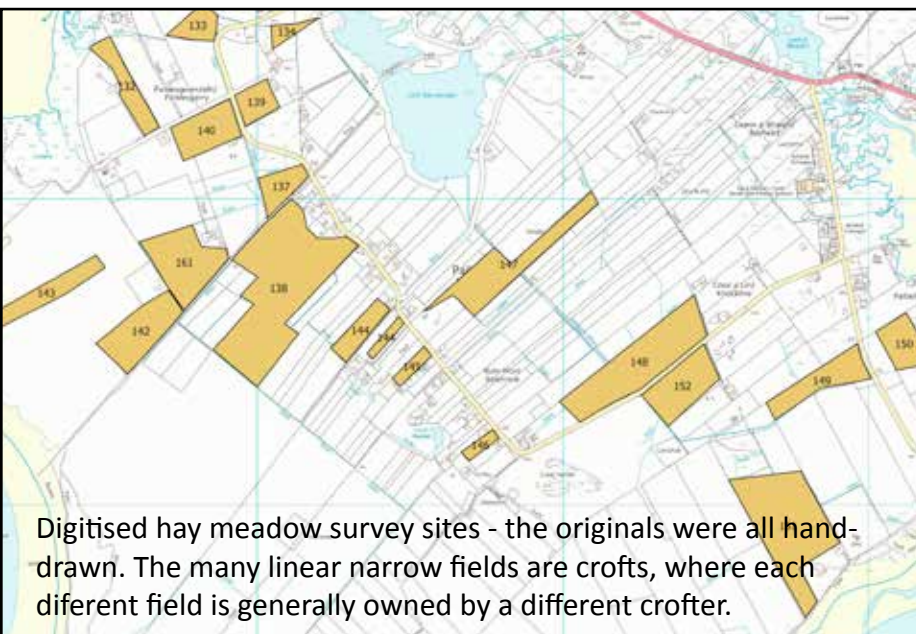
Since its inception, the Partnership has only had limited interaction with Scottish grasslands and relevant organisations, in the belief that classic floodplain meadows did not occur in Scotland. However, discussions with Jane Mackintosh (previously Scottish Natural Heritage Grassland Specialist, now retired) and, more recently, Helen Doherty (current SNH Grassland Specialist) have opened our eyes to the diversity of wet grassland that does occur in Scotland and the close parallels that exist between systems such as the wet machair, and ground-water-fed meadows in the rest of the UK.

This developing appreciation of the machair ecosystem prompted us to visit the Hebrides at the invitation of SNH, (funded by a variety of sources including the Santander Universities Fund, and a Higher Education Innovation Fund from within the OU). We met with Robin Pakeman, from the James Hutton Institute who has researched the sand dune and machair system extensively to better understand how the system works. See [http://www.floodplainmeadows.org.uk/sites/www.floodplainmeadows.org.uk/files/Pakeman\\_et\\_al-2017-Applied\\_Vegetation\\_Science.pdf](http://www.floodplainmeadows.org.uk/sites/www.floodplainmeadows.org.uk/files/Pakeman_et_al-2017-Applied_Vegetation_Science.pdf) for more background on Robin's research.



In preparation for the visit, we analysed data from 'Survey of the hay meadows of the Uists, 1983' by Jane MacKintosh and Una Urquhart. This survey comprised of hand drawn maps, quadrat data and an analysis of the type of plant communities found. We also looked at the 'Sand dune vegetation survey of Scotland: Western Isles' (T. Dargie 1998), which did have digitised area data along with quadrat data. Finally, we also looked at the MG8 Grassland Inventory for Scotland. Putting these data together, just for North and South Uist and the smaller island of Benbecula, we identified areas that we wanted to visit, to see if they still contained interesting vegetation, and whether that vegetation was indeed the kind of thing we are interested in.

## What did we do and what did we find?



Digitised hay meadow survey sites - the originals were all hand-drawn. The many linear narrow fields are crofts, where each different field is generally owned by a different crofter.

We visited 7 different areas, and put the Steering Group to work by quadrating in pairs in as many different fields as we could get to (with many many thanks to SNH's Patrick Hughes who organised access for us). We came out after 3 days with 71 1 x 1 m quadrat records, 111 different species recorded and a maximum species number per quadrat of a whopping 43!!

We weren't able to visit every single meadow that was originally identified by the various surveys, but we visited the

ones we thought looked most relevant. Happily, many of the meadows previously identified appear to still be present, and very species rich, but some had definitely changed for the worse. It seems that although the meadows are hydrologically and from a management perspective, part of the machair system, many of these areas, known as in-by land, are not designated. They are grasslands used by crofters to keep a cow or sheep on during the winter, and in some case to produce hay. In other cases, the in-by is managed as grazing land only.



Patrick Hughes (SNH), David Gowing (FMP) and Ciara Sugrue (Loughborough University), look at one of the most species rich sites we visited.

Our recent trip informed us that there may be almost as much species-rich wet grassland on the islands of Scotland as in the whole of the rest of the UK combined, but it is not recorded. The resource has survived here until now, whilst being lost elsewhere, because of the absence of atmospheric pollution and the maintenance of traditional farming techniques within the crofting system. Nevertheless, this habitat is in a precarious position due to lack of information and management guidance, coupled with changes in land management.



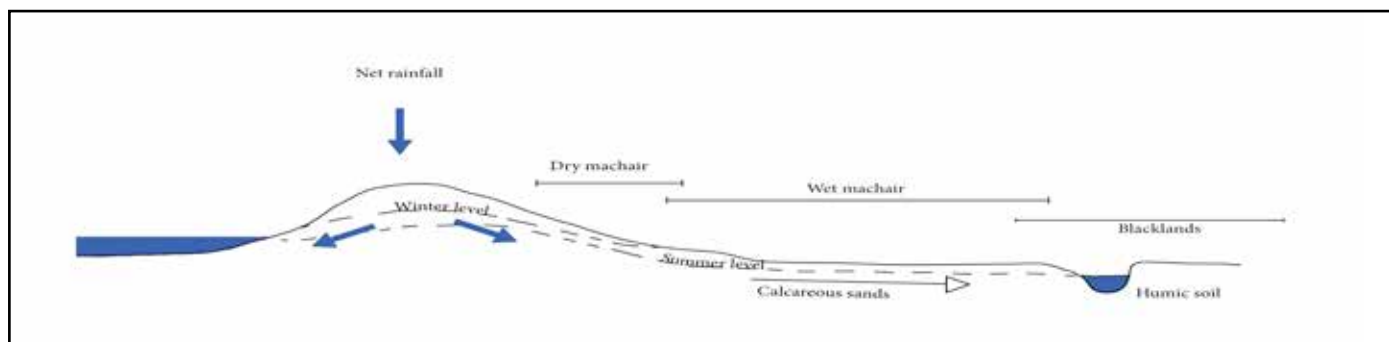
The FMP Steering Group and SNH.

Many crofts are currently used as holiday homes, visited occasionally and limiting effective land management. It is not easy to make money from crofting, and farming practices are changing, with increased use of artificial fertilisers and abandonment of hay making. These changes are sufficient to destroy the sensitive plant communities. Therefore, with SNH we are working on an action plan to help identify the remaining resource, understand better how it functions and therefore how it can best be protected. We would like to apply this

approach to other areas of Scotland, including the Shetlands and some areas of the mainland where the MG8 grassland inventory has identified possible areas of remaining resource and to this end, we are seeking funds.

## How we think the system works hydrologically

We think these systems are a 'seepage' system with moving groundwater. Water lands on the dunes from rain and runs either out into the sea or back down to the east, seeping into the wetter grasslands and ditches then into the lakes in the interior of the islands. Threats to the hydrological function include over deepening ditches or digging new ones in inappropriate places.





# Natural Capital of floodplains: management, protection and restoration to deliver greater benefits

This paper on the natural capital of floodplains has just been launched as part of a series of synthesis reports funded by the Valuing Nature Programme at CEH. We were fortunate enough to have been awarded one of these small grants earlier in the year along with 4 other projects. The paper can be downloaded here <http://www.floodplainmeadows.org.uk/sites/www.floodplainmeadows.org.uk/files/VNP09-NatCapSynthesisReport-Floodplains-A4-16pp-144dpi.pdf>

We carried out a literature review to see what had been quantified about natural capital of floodplains. This review has not yet been published, but we produced the paper based on that work.

We found that:

- **Floodplains cover 5% of the land area of the UK.**
- **42% of floodplains are disconnected from their rivers.**
- **70% of floodplains in England and Wales are intensive agriculture**
- **Only 3% of English and 1.5% of Welsh floodplains contain semi-natural grassland.**

We propose that semi natural species rich habitats such as floodplain meadows and wet broad-leaved woodland deliver the greatest number of different benefits to people including biodiversity, carbon sequestration and pollination. Intensive agricultural habitats such as arable and horticulture deliver the fewest benefits, albeit that one of them, food production is an important benefit. We therefore conclude that in order to deliver as wide a range of benefits as possible, Government should endeavour to re-balance the landuse in floodplains slightly more in favour of species-rich semi-natural habitats than currently, not least because some of those more intensive landuses are actively damaging to society through soil loss, water run off and release of carbon. We summarised 3 case studies to show how people have quantified the value of floodplain habitats, and made recommendations to Government about a new agri-environment scheme option which should contain incentives to facilitate the following:

- **Re-connection of rivers with their floodplains to allow them to flood and drain naturally;**
- **A shift of land use from intensive agricultural production to semi-natural habitats that can help to slow, store and filter water;**
- **Floodplain grassland management that promotes carbon and nutrient capture, and biodiversity supporting pollinating insects and biological control agents of pests and diseases.**

**Anyone working on the new A-E scheme should be aware of these messages and be actively feeding them into the new system and its management prescriptions. Please get in touch for further information.**

