Floodplain Meadow Restoration Case Study
Ismore Meadow 2, river Severn, Shropshire

Landownership and site background

This field is owned by the National Trust, Attingham Park Estate and managed by a tenant farmer. It was previously in arable, including potatoes, but the site was flooded too much for this to remain viable.

It was unmanaged for 2 years before the NT took it on directly. It is now in an organic HLS option and being restored to floodplain meadow.

Restoration activity

The restoration activity started in 2011. The NT sprayed twice and then spread green hay in the late summer of 2011. They also sowed a wheat crop to retain soil.

Ten acres of green hay came from Mottey Meadows National Nature Reserve on 31st July 2011.

They timed work to coincide with when Mottey hay was ready for cutting. The hay was cut, put onto waggons and moved straight away to Ismore Meadows. It was spread using muck spreader and then rolled out.

In 2012, there was concern that there wasn't much interest on the site, that it shouldn't go back into a CS option and had a lot of weedy species. However the NT continued with the meadow management and whilst still work in progress the restoration is widely regarded as a success.

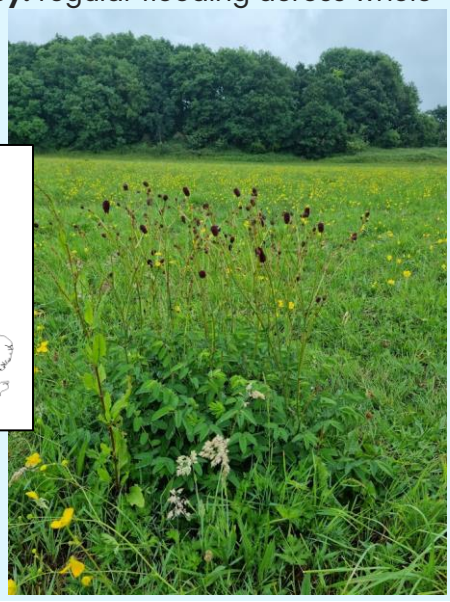
Current management

Hay cutting is slightly sporadic. It should be cut after 15th July, but sometimes is only topped and grazed. The farm tenant has been reluctant to mow for hay in some years. By the time of the visit in late June 2023 however, it had been cut – probably in May as there had been some re-growth, although a small section had not been cut.

The site has been monitored since 2013 using a W-walk transect with 10 stops, recording 1m2 quadrat at each stop.

Site information

Size: 4.79 ha
Public access: No
Phosphorus levels: Not known
Soil type and profile: Sandy clay loam
Flood frequency: regular flooding across whole field.



Progress by 2023*

The sub-community MG15b- *Lolium perenne-Ranunculus acris* subcommunity grassland is the closest match here according to the National Vegetation Classification. Grasses including perennial rye-grass *Lolium perenne, Yorkshire fog Holcus lanatus, sweet vernal grass Anthoxanthum odoratum* and rough-stalked meadow-grass *Poa trivialis* were among the dominant grass species on the field.

The plant community is not very diverse, with about 13 species per $1m^2$. The most abundant forbs are ribwort plantain *Plantago lanceolata,* creeping buttercup *Ranunculus repens* and meadow buttercup *R. acris*. Target meadow forbs like great burnet, common sorrel *Rumex acetosa,* selfheal *Prunella vulgaris,* meadowsweet *Filipendula ulmaria* and ragged Robin *Lychnis flos-cuculi* are present but rare in the field, although they are well established. Oxeye daisy *Leucanthemum vulgare* was very well spread.

Progress by 2023 continued

By the second visit in 2023, the field had about 20% of bare ground or similar proportion of ground cover from plant litter, which is reflected in the high abundance of ruderal, bare-ground loving species like ribwort plantain *Plantago lanceolata* and dandelion *Taraxacum* species.

However, competitive species like perennial ryegrass *Lolium perenne* and creeping bent grass *Agrostis stolonifera* are also dominant. This affects the functional species diversity on the meadow. Very competitive (C) and ruderal (R) (easily spread but not long lasting in the community) species are abundant, while stress-tolerant species (S) (slowly establishing but long-lasting in the community) are in the minority (Table 2). In well developed, ancient meadows, the three functional types are represented more or less equally.

The taxonomic diversity has became more unevenly spread, ranging from 9 to 19 species per 1 sq m. The field has become grassier with Cuckooflower grassland (MG15 *Alopecurus pratensis-Poa trivialis-Cardamine pratensis), as well as Perennial ryegrass leys (MG7 - Lolium perenne leys), both scoring a goodness-of-fit of over 60% (Table 1).*

Individual plants of great burnet *Sanguisorba officinalis* and common knapweed *Centaurea nigra* are well established, but still uncommon. Yellow rattle *Rhinanthus minor,* field wood-rush *Luzula campestris* and selfheal *Prunella vulgaris* were not recorded in 2023,.

According to Ellenberg's indicator scores, the soil fertility has increased slightly. The soil moisture level looks quite stable, but soil reaction has became more neutral (less acidic) (Table 1).

	2017	2023
Ellenberg F (moisture tolerance)	5.8	5.5
Ellenberg N (fertility)	5.34	5.46
Ellenberg R (Reaction)	5.76	6.32
Species/quadrat (mean and range /1 m x 1 m)	13.4 (13-14)	13 (9-19)
NVC (top 2 MAVIS subcommunities)	MG15b MG4c	MG15b MG7

* **A summary of the data collection and analysis methods used is available here**

Table 2. Five categories of meadow restoration progress, measured by indicator scales based on species richness, NVC similarity score and ratios of Grime's plant functional types. Adapted from Rothero, Tatarenko & Gowing, 2020*.

	Score of progress (1 = poor progress, 5 = very good progress)				
Measure	1	2	3	4	5
Average scores from five botanical quadrats per field. Calculated in MAVIS					
Species richness (number of species per 1 m^2)	<8	8 to 12	13-15	16-20	>20
NVC similarity score	<50%	50-55%	55-60%	>60%	>65%
C:S ratio	1.65	1.39	1.23	1.1	1.09
S:R ratio	0.67	0.79	0.81	0.89	0.93

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Management recommendations

2017
This restoration field is progressing well. It is however important to make sure the hay is cut at the end of June/early July whenever possible. Ensuring a regular, annual hay cut at this time should improve the hay quality and speed up the restoration process. Although this field is slightly wet and fertile, the Ellenberg scores suggest that it is well within the boundaries for an MG4 type community, given appropriate management.

2023
Although there are many typical meadow species here, their spread across the field remains very slow. There is a large proportion of bare ground which would provide a good opportunity to enhance both the diversity and abundance of forb species if there is the option of spreading more green hay or seeds.