# Floodplain Meadow Restoration Case Study
# Thames River Meadows Field 1, Oxfordshire

## Landownership and site background

This field is privately owned and sits alongside the river Thames near to Oxford.

It has been in various Stewardship schemes since 2008, and has recently (20221) renewed.

The old agreement was for HK7 (restoration of species rich grassland through HLS
Under the new agreement, they are required to cut for hay every year and are in option GS6, management of species rich grassland.

## Restoration activity

It is thought that green hay was spread in 2008 as there is a note on the file to that end, but changes in staff mean the detail has been lost. Green hay would have been taken from one of the nearby ancient floodplain meadow SSSI's.

## Current management

The farm has made hay after the 15th July in each year from year 2 of the agreement (2009). No manure has been applied since entering the agreement, but they do pull ragwort, and chain harrow at the start of each year before 15th March.

Since 2017, the farm are allowed to cut from 1st July instead of 15th July and they usually do cut in first 2 weeks of July.

Grazing is with sheep, in very low numbers (300 across the whole area including adjacent feilds). Typical winter numbers would be: 1 - 10th Nov – 300 sheep. 1st - 25th Dec – 78 sheep. Sheep are from a nearby farm.

The farm do sell their hay. They did have horses, but the hay was too dry for them. They never have trouble selling their hay, and are always able to get rid of all of it, so there is a market for this hay.

## Site information

**Size:** 9.6 ha
**Public access:** No
**Phosphorus levels**: Not known
**Soil type and profile**: Not recorded
**Flood frequency:** Annual
**Cost:** Through Stewardship
**End use of hay:** Sold off farm

## Progress by 2023*

The FMP have collected monitoring data from this field in 2016 and again in 2021.

In 2016 the vegetation was classified by MAVIS as closest to MG6a Ryegrass pasture (*Lolium perenne-Cynosurus cristatus*) grassland.

This field demonstrates a relatively high species diversity, (up to 23 species/$m^2$), comparable with an average 25 species/$m^2$ on the nearby ancient floodplain meadow.

Great burnet *Sanguisorba officinalis*, one of the key indicator species for the MG4 community, and found in the donor field, is absent here. The seedlings of this species cannot survive competition from the dense sward in such fields and tend to show poor germination and poor and slow spread on restoration sites over the long term.

Dandelion (*Taraxacum* agg.) is very abundant here, with a much higher cover than on the nearby ancient meadows. This might reflect the previous management of the fields as pasture. It will decrease eventually after other species develop a more dense network of underground organs.

## Table 1 Summary of the botanical data collected

| | 2016 | 2021 |
|---|---|---|
| **Ellenberg F (moisture tolerance)** | **5.54** | **5.45** |
| **Ellenberg N (fertility)** | **5.26** | **4.97** |
| **Ellenberg R (Reaction)** | **6.26** | **6.33** |
| **Species/quadrat (mean and range /1 m x 1 m)** | **20.2 (16.23)** | **21 (17-26)** |
| **NVC (top 2 MAVIS subcommunities)** | **MG6a MG5a** | **MG4b MG4a** |

## Progress continued

Many other meadow species including glaucous sedge *Carex flacca,* ribwort plantain *Plantago lanceolata,* Autumn hawkbit *Leontodon autumnalis,* rough hawkbit *L. hispidus*, cowslip *Primula veris* and ladies smock *Cardamine pratensis*, have established well, forming large clumps. Green winged orchid *Orchis morio* is spreading nicely. All these very positive records show that this is becoming a nice species rich meadow.

Species that are absent but would be expected based on the nearby donor site include great burnet *Sanguisorba officinalis*, pepper saxifrage *Silaum silaum*, ladies bedstraw *Cardamine pratensis* and common meadow rue *Thalictrum flavum*.

The 2021 botanical survey recorded continued excellent progress of this field towards the species-rich meadow plant community of the nearby ancient meadow. The Burnet floodplain meadow (MG4) plant community has now established on this field.

This field appears to be drier and less fertile in 2021 (estimates based on Ellenberg's indicator scores; see the Table below) compared to 2016. Regular and earlier hay cuts carried out in recent years have helped in the reduction of soil fertility. Grasses are less abundant if the soil fertility decreases, leaving more space for forbs to spread and establish.

The functional plant diversity has improved substantially. In 2016, competitors and ruderal plants dominated the sward; by 2021 their ratio has become more well balanced with stress-tolerant species, which indicates good progress towards the standards of ancient, well established meadows.

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

**Table 2. Restoration progress***
Yellow highlighted figures show where the field stands on the scale of restoration progress

| Field 1 | Progress score 2021 | | | | |
|---|---|---|---|---|---|
| **Measure** | 1 Poor progress | 2 | 3 | 4 | 5 very good progress |
| **Average scores from five botanical quadrats per field. Calculated in MAVIS** | | | | | |
| **Species richness** | <8 | 8 to 12 | 13-15 | 16-20 | >20 |
| **NVC similarity score** | <50% | 50-55% | 55-60% | >60% | >60% |
| **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 |

**Management Recommendations**

Consider hand selecting seeds from particular species on nearby SSSI meadow to encourage germination of those harder-to-establish species including great burnet, *Sanguisorba officinalis*, pepper saxifrage *Silaum silaum*, ladies bedstraw *Cardamine pratensis* and common meadow rue *Thalictrum flavum*.

Otherwise continue with the annual regime of management here, which is working very well.

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