

Floodplain Meadow Restoration Case Study Great Langdale 3 & 4), Great Langdale Beck, Cumbria

Landownership and site background

The field is owned by the National Trust and managed through a tenancy.

Restoration activity

These fields were mown and chain harrowed, before the seed was sown in 2014. They were then rolled. Some plug planting has also been undertaken in 2014 in Field 4. Seed was supplied through the National Trust.

Current management

The fields are hay cut and aftermath grazed.

Progress by 2023*

Field 3 was surveyed on walk-through basis only in 2017. Common bent grass *Agrostis capillaris* and Yellow rattle *Rhinanthus minor* were the two dominant species. Common knapweed *Centaurea nigra*, ribwort plantain *Plantago lanceolata*, and oxeye daisy *Leucanthemum vulgare* were well established and spread across the field. Meadow buttercup *Ranunculus acris*, selfheal *Prunella vulgaris*, rough hawkbit *Leontodon hispidus* and meadow crane's-bill *Geranium pratense* were in the field in small numbers. A record of carnation sedge *Carex panicea* in the field is a very interesting observation because sedges are very rarely observed on restoration fields.

By 2023 Field 3-A looked to be progressing well. There were 17 species per 1 square metre (Table 1), and Grimes functional types (competitors, stress tolerant and ruderal plants) were well balanced (a very good sign for restoration fields). However, the plant community type was not a good fit to any NVC reference communities. The closest plant community is MG6b *Lolium perenne*-*Cynosurus cristatus* grassland, *Anthoxanthum odoratum* sub-community. This is typical for restoration fields however, and continued meadow management will enable the plant community to develop over time.

Site information

Size: 0.9 ha

Public access: No?

Phosphorus levels:

pH:

Soil type and profile: 0-15 cm of silty loam with 20% gravel. Stones below 15 cm.

Flood frequency: Doesn't flood very often if ever. There is a stone wall separating the river from the fields.



Field 3 B was found to be much more species poor than Field 3 A (Table 1), but the ratios between the different functional groups of plants, as for Field 3-A, are also well balanced, although large patches of bare ground were noted.

The vegetation in Field 4 is also relatively sparse and short. The average species richness is 14 sp/m², going as high as 18 sp/m² in some places. The closest NVC plant community appears to be MG6b *Lolium perenne*-*Cynosurus cristatus* grassland, *Anthoxanthum odoratum* sub-community. The ratios of functional plant groups (Table 2) indicate the dominance of competitive and ruderal species over the more desirable stress-tolerant (typical meadow) species.

Both Fields 3 and 4 have relatively infertile soils (Table 1) which is perfect for meadow restoration, as the sward is sparse and allows new species to establish easily.

Table 1 Summary of the botanical data collected

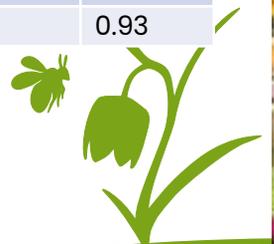
Data from 2023 only	Field 3 A	Field 3 B	Field 4
Ellenberg F (moisture tolerance)	5.1	5.23	5.1
Ellenberg N (fertility)	4.5	4.2	4.62
Ellenberg R (Reaction)	5.5	4.9	5.64
Species/quadrat (mean and range /1 m x 1 m)	17	11 (10-12)	14 (10-18)
NVC (top 2 MAVIS subcommunities)	MG6b MG6	MG6b MG6	MG6b MG5a

Tables 2a and 2b. 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.

Table 2a. Field 3 B	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

Table 2a. Field 4	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

*** [A summary of the data collection and analysis methods used is available here](#)**



Management recommendations

Continue with an annual hay cut.
Both fields will benefit from additional applications of seeds, as species richness is relatively low.

Field 4 meets the criteria for inclusion in Natural England's Priority Habitat Inventory as **Good Quality Semi-improved Grassland**. This means that there are some plant species present which indicate good quality, species-rich meadow, but that continued consideration of progress is required. We did not record enough quadrats to assess PHI quality for Field 3.

