



**North
Pennines
National
Landscape**



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Heggs Farm

Quadrat results 2021 – 2025

Results analysed by Dr Ruth Starr-Kedde, from the North Pennines National Landscape's team

Introduction and methodology

Quadrat surveys were undertaken by groups of two to four volunteers, undertaking 1m x 1m quadrats following a W-shape through the meadow. All plant species such as wildflower, grasses, sedges and rushes, and an estimate of their percentage cover, were recorded onto a survey form. Approximately 7-8 quadrats were undertaken over one day, so each meadow survey was generally undertaken over two days.

Ten quadrats were undertaken over five years at Heggs farm, from the baseline in 2021, in 2023 and 2025. Seed was added to the meadow via green hay transfer after the baseline survey. Below is the comparison of the 10 quadrats, comparing calculated variables, key indicator plant species, and investigating change over-time.

Calculating variables

Total numbers of species (species-richness) was calculated by summing the species for each quadrat. Shannon Diversity Index (H') was calculated using an Excel 'Addin'. Positive Indicator Species scores (P+), Negative Indicator Species Scores (N-) and Total Meadow Scores (TM) were calculated by multiplying the 'Group score' for each species by the percentage cover. Positive indicator species have scores such as 1 for red clover, 2 for yellow rattle, 3 for wood crane's-bill; Negative indicator species have scores such as -1 for white clover, -2 for creeping buttercup, -2 for soft brome. Averages were taken from the quadrats.

Results for Heggs farm quadrats

The meadow at Heggs farm started with a grassy, species-poor sward with a number of negative indicator species and low wildflower diversity. Over-time there has been an increase in floristic composition, showing that seed addition has been successful. Species richness, diversity, positive indicator species scores (P+) (Figure 1.) and meadow scores have all increased, with a slight improvement in the negative indicator score (N-) (see Table 1.).

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The grass composition has changed over-time. There has been an increase percentage cover of the fine-leaved grasses such as red fescue and crested dog’s-tail after seed addition, however, there has also been an increase in the negative indicator, soft brome. Correspondingly, there has also been a decline in the negative indicator perennial rye-grass, and a slight decline in meadow foxtail. Sweet vernal-grass, Yorkshire fog and rough meadow-grass have remained similar over-time. See Table 2.

There has been a noticeable change in the wildflower diversity, with huge increases in percentage cover in common mouse-ear, ribwort plantain, meadow buttercup, common sorrel, dandelion, lesser trefoil (Figure 2.) and red clover, and slight increases in the annuals yellow rattle and eyebright after seed addition. In addition, the negative indicators, creeping buttercup and white clover, have also increased. Changing forget-me-not, rough hawkbit and germander speedwell have remained in low populations over the survey years. See Table 2.

Table 1. Calculated variables such as Species-richness, Shannon Diversity Index (H'), Total Meadow Score (TM), Positive Indicator Species Score (P+) and Negative Indicator Species Score (N-). Averages taken from the 10 quadrats, calculations explained in the methodology section.

Calculated variables	Year One; 2021	Year Two; 2023	Year Three; 2025	Change over-time
Total Meadow Score (TM)	-58.0	-59.1	-26.3	Increased
Species Richness (SpR)	13	13	15	Increased
Shannon Diversity Index (H')	1.98	1.96	2.45	Increased
Positive Indicator Score (P+)	8.0	16.9	36.5	Increased
Negative Indicator Score (N-)	-66.0	-76.1	-62.8	Slight improvement

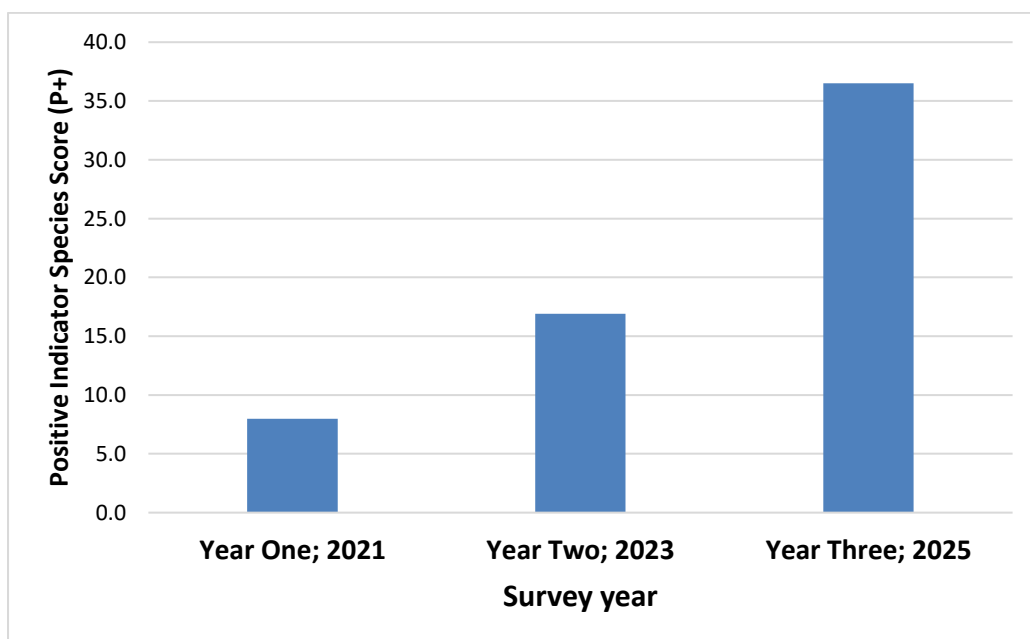


Figure 1. Clear increase in Positive Indicator Species Score (P+) over-time.

Table 2. Key species in quadrats, showing those that have increased or decreased; not including ones that have remained similar.

Plant name	Common name	Year One; 2021	Year Two; 2023	Year Three; 2025	Change over-time
Key grasses, average % cover	Meadow foxtail	3	5	1	Declined
	Crested dog's-tail	1	3	4	Increased
	Red fescue	3.5	3	10.5	Increased
	Soft-brome	5.7	17	29.5	Increased
	Perennial rye-grass	46	42	34.5	Increased
Key wildflowers, average % cover	Common mouse-ear	7.4	4.1	13.3	Increased
	Eyebright	0	0.5	4.5	Increased
	Ribwort plantain	0.3	1.3	14.4	Increased
	Meadow buttercup	1	0.2	6.8	Increased
	Creeping buttercup	11.6	6.8	28.5	Increased
	Yellow-rattle	0.1	0.1	5.6	Increased
	Common sorrel	5	1.2	10.8	Increased
	Dandelion	0.8	2	9.9	Increased
	Lesser trefoil	0.1	11.8	40.2	Increased
	Red clover	0.6	1.8	7.9	Increased
	White clover	13.1	13.7	26.8	Increased

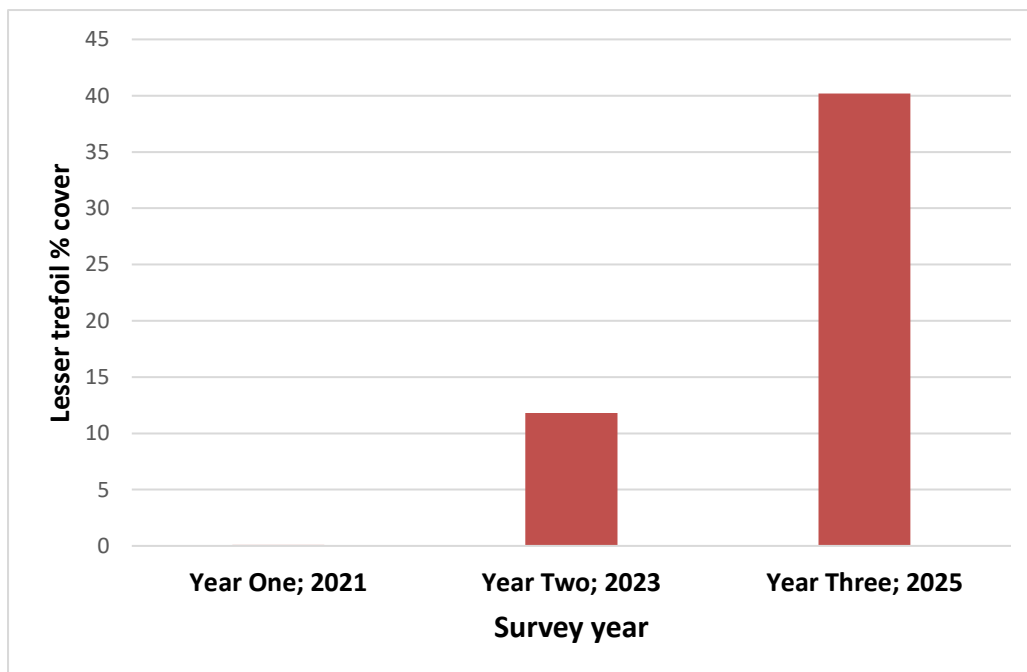


Figure 2. Change over-time of lesser trefoil, a clear increase after seed addition.

