



Recording of the Monitoring Plots, New Fen Thelnetham 2022



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Little Ouse Headwaters Project
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1. AIMS

The Little Ouse Headwaters Project set up two monitoring plots at New Fen Thelnetham, (Stone 2017), one on the dry grassland of the Sandy Terrace and one in the fen meadow of the Peaty Floodplain. This followed baseline surveys of the whole site by Stone (2017).

In 2022 a full resurvey of the plots was commissioned as part of the ongoing survey and monitoring programme. A species list for the wider area of the Peaty Floodplain was also compiled while recording the Plot.

This report summarises the resurvey undertaken in June 2022.

2. METHODS

The survey methods described by Stone (2017) were used to resurvey the two monitoring plots on New Fen, Thelnetham:

Plot N01: Sandy Terrace – located just east of the fenced area on the raised sandy land, just above the floodplain. When the plot was established (Stone 2017), it was dominated by ruderals associated with open ground and by species of eutrophic ground, both deriving from a history of arable cultivation and more recent disturbance.

Plot N02: Peaty Floodplain – located on the recently cleared area of wet scrub, contiguous with Middle Fen. It is at a lower elevation, on the peat floodplain. In 2017 the area was mixed willow scrub with a remnant fen flora.

OHES (2010) gives the four phases of monitoring common to all of the LOHP site monitoring projects, summarised in Table 1.

Table 1: The Four Phases of Monitoring (OHES 2010)

| Survey intensity | Fieldwork Element | | Function within the Survey |
|------------------|-------------------|----------------------------------|---|
| Rapid | 1 | Locating Monitoring Plots | To establish locations for the Monitoring Plots |
| | 2 | Photographic Record | To produce a record surveillance images showing the condition of the developing fen vegetation |
| Full | 3 | Vegetation structural characters | To record features of the vegetation structure against which management requirements can be established. |
| | 4 | Floristic sub-sampling | To record the floristic composition of the plot in order to judge to success of the restoration measures against target floristic conditions. |

Item 1, Location of Monitoring Plots, was undertaken in Stone (2017), along with a first recording of the plots (Items 2-4). This report provides the results of a second recording of Items 2-4, five years after.

Plot and marker details are given in Stone (2017), reproduced in Table 2 and Figure 1. Note that the plot N01 was difficult to relocate as the original marker posts no longer existed and the area was covered in scrub. The GPS coordinates given in red in Table 2 did not closely accord with posts and descriptions on the ground as determined with hand-held Garmin GPS. There may have been interference from the scrub. In 2022, the closest locations identifiable in the field were found by a combination of use of fence posts and measuring from these, and the corners marked with canes. The four corners had the following GPS coordinates in 2022 although again these will be affected by proximity to scrub:

SW Cane – 601295 278835
SE Cane – 601305 278833

NW Cane – 601297 278843

NE Cane – 601307 278841

Although significant differences in plot location for N01 between 2017 and 2022 exist, the changes in plot structure and flora are so significant that such mis-registration is unlikely to affect monitoring outcomes.

Relocation of posts for N02 was straightforward as the original markers had been replaced with substantial posts.

Plant nomenclature is according to Stace (2019) and Hill et al (2008).

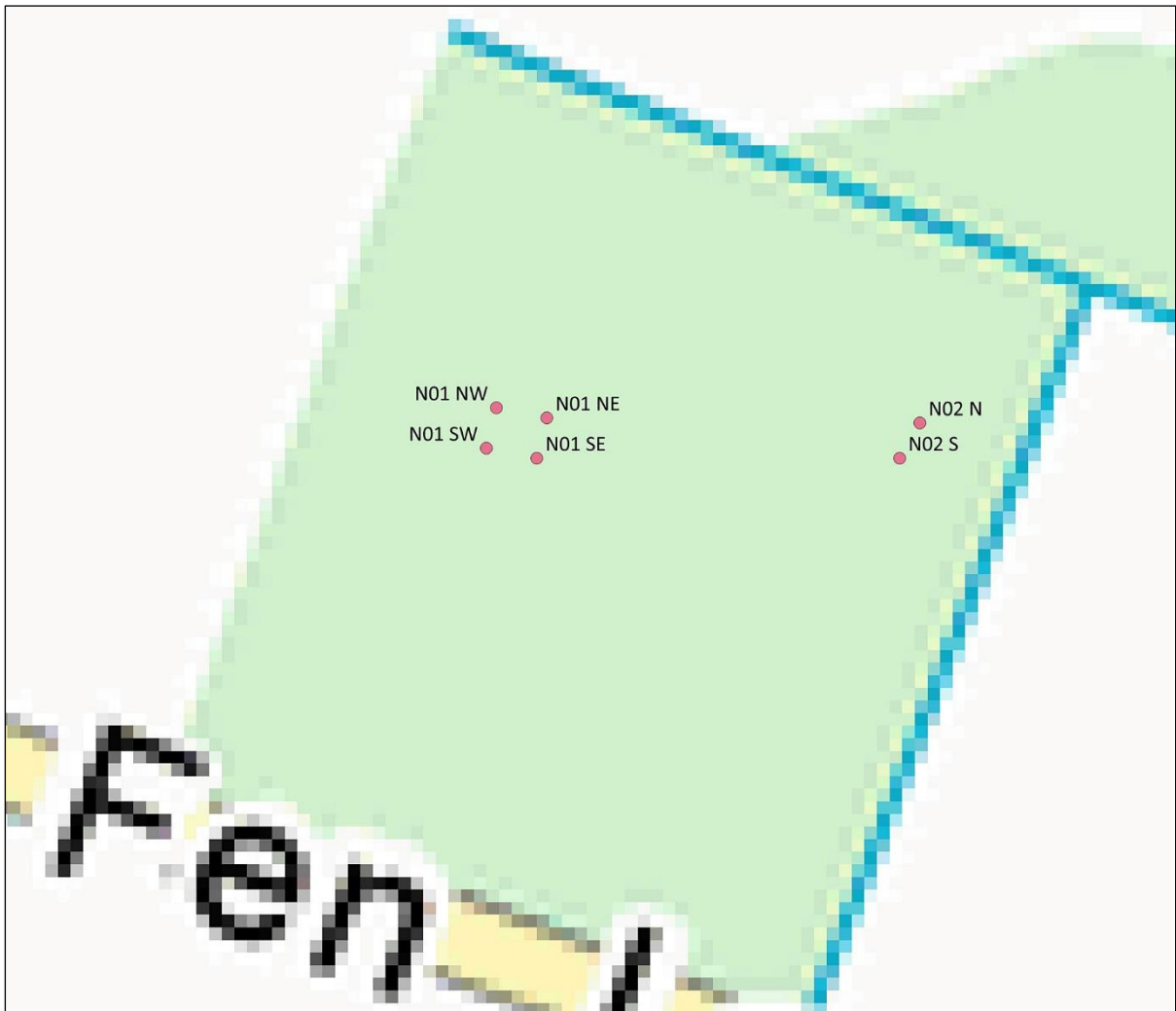
Table 2: Monitoring Plot Locations at New Fen Thelnetham, reproduced from Stone (2017). Eastings and Northings for N01 are those given in Stone 2017, but see comments in text.

| VEGETATION TYPE | PLOT CODE | MARKER POSTS | Marker Post Location | EASTING | NORTHING | Plot location (see Figure 4) |
|------------------|-----------|--------------|--|---------|----------|--|
| Sandy terrace | N01 | N01-N | The marker post (Figure 4) is located on the fenceline using an existing fence post. | 601308 | 278842 | The permanent plot uses the two marker posts as one side of a square with 90° corners |
| | | N01-S | The permanent plot corner is 10 m southward from N01-N on the fenceline, near to an existing fence post, shown in Figure 5 | 601301 | 278833 | |
| Peaty Floodplain | N02 | N02-N | This free-standing marker is located 10 m north of N02-S. | 601381 | 278840 | The permanent plot uses the baseline between marker posts as the western side of the plot. |
| | | N02-S | The free-standing marker post (Figure 7) forms the southwest corner of the permanent plot. | 601377 | 278833 | |

The recommended quadrat size of 1m x 1m was used, with recording of 20 sub-samples in each plot. Neither OHES (2010) nor Stone (2017) specify how sub-samples are to be located within the plot. Hence in 2022, sub-samples were relocated using random number tables and measuring tapes along two of the plot sides.

The weather preceding the survey was rather dry, with relatively little rain in April and May. Consequently the vegetation was significantly advanced compared to “typical”. The survey work was undertaken on 1st and 2nd June.

Figure 1: Location of Plots. Locations shown for the four corners of N01 are the cane locations actually used in 2022.



3. RESULTS

3.1 Plot N01: Sandy Terrace

3.1.1 Photographic Record

N01: Sandy Terrace Quadrants



3.1.2 Vegetation Structural Characters

| | | | | | | |
|---|----------------------------|---------------------------|-----------|---------------|-----------|----------------|
| Monitoring Plot | | N01 | | | | |
| Recorder | | Mike Harding | | | | |
| Survey Date | | 1 st June 2022 | | | | |
| Character of the ground surface | | | | | | |
| Flat ground with sandy loam soil. Past disturbance from site management operations – installing fence etc – and some evidence of old fire site. Also includes a log pile. Soil was firm and relatively dry. | | | | | | |
| Soil Wetness | | | | | | |
| Dry, dusty | | Dry, firm | | Slightly damp | | Moist |
| | | | | III | | |
| | Attribute | Quadrant | | | | Average |
| | | SW | SE | NW | NE | |
| Layer height | Standing water (cm) | 0 | 0 | 0 | 0 | 0 |
| | Plant litter (cm) | 4 | 3 | 5 | 3 | 3.75 |
| | Woody seedlings (cm) | 10 | 15 | 0 | 20 | 15 |
| | Large sedges / rushes (cm) | 0 | 0 | 0 | 0 | 0 |
| | Reed-like grasses (cm) | 0 | 0 | 0 | 0 | 0 |
| | Woody saplings (cm) | 170 | 180 | 200 | 220 | 192.5 |
| Cover value | Standing water (%) | 0 | 0 | 0 | 0 | 0 |
| | Trampling (%) | 0 | 0 | 0 | 0 | 0 |
| | Dunging (%) | 0 | 0 | 0 | 0 | 0 |
| | Bare ground (%) | 20 | 40 | 10 | 40 | 27.5 |
| | Plant litter (%) | 40 | 80 | 70 | 90 | 70 |
| | Bryophytes (%) | 0 | 0 | 0 | 0 | 0 |
| | Woody seedlings (%) | 5 | 10 | 0 | 20 | 8.75 |
| | Large sedges / rushes (%) | 0 | 0 | 0 | 0 | 0 |
| | Reed-like grasses (%) | 0 | 0 | 0 | 0 | 0 |
| | Woody saplings (%) | 40 | 100 | 10 | 15 | 41.25 |

3.1.3 Floristic Sampling

| | |
|------------------------|--------------|
| Monitoring Plot | N01 |
| Recorder | Mike Harding |
| Survey Date | 1 June 2022 |

| | Sample Number, 1m ² | | | | | | | | | | | | | | | | | | | | Frequency 2022 | Frequency 2017 |
|--------------------------------|--------------------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-------------------|-------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | | |
| <i>Cornus sanguinea</i> | P | P | P | | P | P | P | P | P | | | P | P | P | P | P | P | | | P | 75 | 35 |
| <i>Galium aparine</i> | | P | P | P | P | P | P | P | P | P | P | P | | | | | P | P | P | P | 75 | 15 |
| <i>Urtica dioica</i> | P | P | | P | P | P | P | P | | P | P | | | | | | | P | P | P | 60 | 100 |
| <i>Holcus lanatus</i> | P | P | P | | | | | | P | P | P | | P | P | | | | P | P | P | 55 | 10 |
| <i>Agrostis stolonifera</i> | P | P | | | P | P | | P | P | P | | | P | | P | P | | | | | 50 | 80 |
| <i>Dactylis glomerata</i> | | P | P | P | P | | | | P | | P | P | | | | | | P | P | P | 50 | 10 |
| <i>Rubus fruticosus</i> | | P | P | P | | | P | P | P | | | P | | P | | P | P | | | | 50 | 5 |
| <i>Kindbergia praelonga</i> | | | | | | | | P | P | P | P | | P | | P | P | | P | P | P | 50 | 10 |
| <i>Cirsium arvense</i> | | P | | P | P | | P | P | | P | | | | | P | | | P | P | | 45 | 80 |
| <i>Brachythecium rutabulum</i> | | | | | | | | P | | P | | | P | P | | P | P | P | P | P | 45 | 20 |
| <i>Poa trivialis</i> | | | | | | P | | | P | P | P | P | | P | | | | | P | P | 40 | 75 |
| <i>Glechoma hederacea</i> | | P | P | | P | | | | P | | P | P | | | P | | | | | | 35 | |
| <i>Crataegus monogyna</i> | | | P | | P | | P | | | | | | P | | P | P | | | | | 30 | 10 |
| <i>Arrhenatherum elatius</i> | | | P | | | P | | | | | | P | | | | P | P | | | | 25 | |
| <i>Ranunculus repens</i> | P | P | | | | | | | | P | | | P | | | | | | | | 20 | 20 |
| <i>Vicia sativa</i> | P | | | | | | | | P | | | | | P | | | | | | | 15 | |
| <i>Elymus repens</i> | P | | | | | | | | | | | P | P | | | | | | | | 15 | 20 |
| <i>Eupatorium cannabinum</i> | | | P | | | | | P | | | | | | | | | P | | | | 15 | |
| <i>Mentha arvensis</i> | P | | | | | | | | | | | | | | | | | P | | | 10 | 20 |
| <i>Myosotis arvensis</i> | P | | | | | | | P | | | | | | | | | | | | | 10 | 10 |
| <i>Jacobaea erucifolia</i> | | P | | | | | | P | | | | | | | | | | | | | 10 | |
| <i>Corylus avellana</i> | | | | p | | | | | | | | | | | | | p | | | | 10 | 5 |

| | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------------------|--|--|--|---|---|---|--|---|---|---|---|--|--|---|---|--|--|---|--|----|----|----|
| Juncus inflexus | | | | | P | | | P | | | | | | | | | | | | 10 | 5 | |
| Prunus spinosa | | | | | | P | | | | | P | | | | | | | | | | 10 | 15 |
| Populus tremula | | | | | | | | P | P | | | | | | | | | | | | 10 | |
| Conium maculatum | | | | | | | | | | | P | | | | | | | P | | | 10 | 5 |
| Geranium robertianum | | | | | | | | | | | | | | P | P | | | | | | 10 | |
| Jacobaea vulgaris | | | | P | | | | | | | | | | | | | | | | | 5 | 5 |
| Anthriscus sylvestris | | | | | | | | | | P | | | | | | | | | | | 5 | |
| Rumex sanguineus | | | | | | | | | | | | | | | | | | | | P | 5 | 5 |
| Carex remota | | | | | | | | | | | | | | | | | | | | P | 5 | 5 |
| Salix caprea | | | | | | | | | | | | | | | | | | | | | | 10 |
| Fraxinus excelsior | | | | | | | | | | | | | | | | | | | | | | 5 |
| Poa annua | | | | | | | | | | | | | | | | | | | | | | 10 |
| Silene latifolia | | | | | | | | | | | | | | | | | | | | | | 35 |
| Plantago major | | | | | | | | | | | | | | | | | | | | | | 30 |
| Sonchus arvensis | | | | | | | | | | | | | | | | | | | | | | 20 |
| Sonchus oleraceus | | | | | | | | | | | | | | | | | | | | | | 20 |
| Cirsium palustre | | | | | | | | | | | | | | | | | | | | | | 15 |
| Cirsium vulgare | | | | | | | | | | | | | | | | | | | | | | 15 |
| Sonchus asper | | | | | | | | | | | | | | | | | | | | | | 15 |
| Taraxacum agg., sect ruderales | | | | | | | | | | | | | | | | | | | | | | 15 |
| Alliaria petiolata | | | | | | | | | | | | | | | | | | | | | | 10 |
| Lysimachia arvensis | | | | | | | | | | | | | | | | | | | | | | 10 |
| Chenopodium album | | | | | | | | | | | | | | | | | | | | | | 10 |
| Erigeron canadensis | | | | | | | | | | | | | | | | | | | | | | 10 |
| Fraxinus excelsior seedling | | | | | | | | | | | | | | | | | | | | | | 10 |
| Trifolium repens | | | | | | | | | | | | | | | | | | | | | | 10 |
| Crepis capillaris | | | | | | | | | | | | | | | | | | | | | | 5 |
| Epilobium ciliatum | | | | | | | | | | | | | | | | | | | | | | 5 |
| Epilobium hirsutum | | | | | | | | | | | | | | | | | | | | | | 5 |
| Matricaria discoidea | | | | | | | | | | | | | | | | | | | | | | 5 |
| Stellaria aquatica | | | | | | | | | | | | | | | | | | | | | | 5 |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------|---|----|----|---|---|---|---|----|----|----|---|----|---|---|---|---|---|----|---|---|------------|------------|---|-------------|
| Rosa arvensis | | | | | | | | | | | | | | | | | | | | | | | 5 | |
| Rumex sanguineus | | | | | | | | | | | | | | | | | | | | | | | | 5 |
| Solanum nigrum | | | | | | | | | | | | | | | | | | | | | | | | 5 |
| Veronica persica | | | | | | | | | | | | | | | | | | | | | | | | 5 |
| Funaria hygrometrica | | | | | | | | | | | | | | | | | | | | | | | | 15 |
| Amblystegium serpens | | | | | | | | | | | | | | | | | | | | | | | | 10 |
| Brachythecium velutinum | | | | | | | | | | | | | | | | | | | | | | | | 10 |
| Ceratodon purpureus | | | | | | | | | | | | | | | | | | | | | | | | 10 |
| Hypnum resupinatum | | | | | | | | | | | | | | | | | | | | | | | | 5 |
| | | | | | | | | | | | | | | | | | | | | | | | | Mean |
| Species number | 9 | 11 | 10 | 6 | 9 | 7 | 6 | 13 | 11 | 10 | 7 | 10 | 8 | 7 | 7 | 8 | 6 | 10 | 8 | 9 | 8.6 | 9.0 | | |

3.1.4 Commentary

Vegetation structure

Structurally, the Plot has two parts. Around two thirds is often dense *Cornus sanguinea* scrub, mostly closed-canopy, with an understorey of sparse herbs and some bryophytes, the herbs being a remnant of the original herb flora described in 2017. There is also frequent to locally dominant *Rubus fruticosus*. Those which are intolerant to shade and lack of disturbance have declined or are absent. The woody element is a scrub habitat without mature maidens although over time these will be recruited. The remaining one third is more or less open, grassland habitat with scrub and *Rubus* starting to invade. It is mostly dominated by the grasses *Holcus lanatus* and *Dactylis glomerata* which can be tall and dense, with indicators of eutrophic conditions such as *Galium aparine* and *Urtica dioica* in patches. There are some shorter areas perhaps marking an old fire site or heavily trampled areas, and a pile of logs. There is a single, young ash standard in the grassland.

Floristics

The scrub and grassland structural components have a similar flora, with the obvious exception of the dominance of scrub in the larger area, compared with grasses in the smaller open area. Although the two areas share common species, the flora is much reduced in cover and diversity under the scrub, but remains but clearly relatable.

Cornus sanguinea is the dominant scrub species, with *Rubus fruticosus* and *Crataegus monogyna* frequent, with less common *Prunus spinosa*, *Corylus avellana* and *Populus tremula*. In the absence of management the whole plot will clearly progress to closed canopy scrub and then woodland.

There is a grassy ground of *Holcus lanatus* and *Dactylis glomerata*, which in the absence of rabbit grazing and scrub cover can be tall and tussocky. There is also frequent *Agrostis stolonifera* and *Poa trivialis*, but these are not abundant and are especially reduced under scrub. They have declined greatly since 2017. Less frequently, and in more open areas, there is *Arrhenatherum elatius* and *Elymus repens*.

The main herbs are those indicating enriched soils, *Urtica dioica* and *Galium aparine*, and disturbed ground such as *Cirsium arvense*. While the first two can be abundant, the complement of ruderals, eutrophic indicators and disturbance is much reduced compared to 2017, reflecting stability of the soil and the dominance by scrub.

Bryophytes are restricted to the catholic *Kindbergia praelonga* and *Brachythecium rutabulum*, which can be abundant on the ground. The bryophytes of burn sites and disturbance recorded in 2017 were not recorded in 2022.

There are no species of conservation interest, although there are some indicating damp ground – *Eupatorium cannabinum* and *Juncus inflexus* – although even with management this is unlikely to develop true wetland interest.



The plot is rather immature and transitional to assign firmly to NVC communities. The scrub area is perhaps closest to an immature W21 *Crataegus monogyna-Hedera helix*

| |
|--|
| scrub, with the open grassland the <i>Urtica dioica</i> sub-community of MG1 <i>Arrhenatherum elatius</i> grassland. |
| <p>Summary of records and events</p> <p>The plot appears not to have received any management since the 2017 first recording.</p> |
| <p>Relation to past and target conditions</p> <p>It is not clear what the original intention for this plot was. If it was intended to maintain as open sandy grassland it is clearly failing and will soon progress to scrub and woodland.</p> <p>If the intention is for a grassland/scrub mosaic or to progress to woodland, then the plot is in appropriate condition, although maintaining a mosaic will require periodic intervention.</p> |

3.2 N02: Peaty Floodplain

3.2.1 Photographic Record

N02: Peaty Floodplain Quadrants

| | |
|---|--|
| South West | South East |
|  |  |
| North West | North East |
|  | No photo |

3.2.2 Vegetation Structural Characteristics

| | | | | | | |
|--|----------------------------|----------------------|---------------|-----------|-----------|----------------|
| Monitoring Plot | | N02 Peaty Floodplain | | | | |
| Recorder | | Mike Harding | | | | |
| Survey Date | | 2 June 2022 | | | | |
| Character of the ground surface | | | | | | |
| Overall flat but with a pronounced micro-topography often associated with old scrub stumps or hollows left after restoration work. The hollows carried no standing water but the peat was wet. Outside of the hollows the ground was a little dryer. | | | | | | |
| Soil Wetness | | | | | | |
| Dry, dusty | | Dry, firm | Slightly damp | Moist | Wet | Saturated |
| | | | | III | I | |
| | Attribute | Quadrant | | | | Average |
| | | SW | SE | NW | NE | |
| Layer height | Standing water (cm) | 0 | 0 | 0 | 0 | 0 |
| | Plant litter (cm) | 1 | 1 | 1 | 1 | 1 |
| | Woody seedlings (cm) | 5 | 5 | 5 | 5 | 5 |
| | Large sedges / rushes (cm) | 40 | 40 | 40 | 40 | 40 |
| | Reed-like grasses (cm) | 45 | 0 | 0 | 0 | 11.25 |
| | Woody saplings (cm) | 0 | 0 | 0 | 0 | 0 |
| Cover value | Standing water (%) | 0 | 0 | 0 | 0 | 0 |
| | Trampling (%) | 0 | 0 | 0 | 0 | 0 |
| | Dunging (%) | 0 | 0 | 0 | 0 | 0 |
| | Bare ground (%) | 5 | 10 | 10 | 7 | 8 |
| | Plant litter (%) | 5 | 5 | 10 | 15 | 8.75 |
| | Bryophytes (%) | 60 | 80 | 70 | 60 | 67.5 |
| | Woody seedlings (%) | 2 | 2 | 2 | 4 | 2.5 |
| | Large sedges / rushes (%) | 60 | 70 | 55 | 70 | 63.75 |
| | Reed-like grasses (%) | 4 | 5 | 3 | 3 | 3.75 |
| | Woody saplings (%) | 0 | 0 | 0 | 0 | 0 |

3.2.3 Floristic Sampling

| | |
|------------------------|----------------------|
| Monitoring Plot | N02 Peaty Floodplain |
| Recorder | Mike Harding |
| Survey Date | 2 June 2022 |

| | Sample Number | | | | | | | | | | | | | | | | | | | | Frequency 2022 | Frequency 2017 |
|---------------------------------|---------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-------------------|-------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | | |
| <i>Juncus subnodulosus</i> | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P | 100 | 10 |
| <i>Mentha aquatica</i> | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P | 100 | 85 |
| <i>Equisetum palustre</i> | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P | 100 | 10 |
| <i>Lotus pedunculatus</i> | P | P | P | P | P | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | 95 | 25 |
| <i>Calliergonella cuspidata</i> | P | P | P | P | P | P | P | P | P | P | P | P | P | | P | P | P | P | P | 95 | 5 | |
| <i>Holcus lanatus</i> | P | P | P | P | P | P | P | P | P | P | P | P | | P | P | | P | P | P | 90 | 10 | |
| <i>Brachythecium rutabulum</i> | P | P | P | P | P | P | P | P | P | P | | P | P | P | P | P | P | | P | 90 | 10 | |
| <i>Galium uliginosum</i> | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P | | P | | 90 | 30 | |
| <i>Cirsium palustre</i> | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P | | 90 | 60 | |
| <i>Hypericum tetrapterum</i> | P | P | | P | P | P | P | P | P | P | P | P | P | | P | | P | P | | 80 | 10 | |
| <i>Eupatorium cannabinum</i> | P | P | P | P | P | P | P | | P | P | | | | P | P | P | P | P | P | 80 | 100 | |
| <i>Carex acutiformis</i> | | | | P | P | P | P | P | P | P | P | P | P | | P | P | P | P | P | 80 | | |
| <i>Phragmites australis</i> | P | P | | P | | | | P | P | P | P | P | P | P | | P | | P | P | 70 | 40 | |
| <i>Festuca rubra</i> | P | P | P | P | P | P | P | P | P | P | | | P | | P | P | | | P | 70 | | |
| <i>Rhinanthus minor</i> | | | P | P | | P | P | P | P | P | P | P | P | | P | | P | P | | 70 | | |
| <i>Agrostis stolonifera</i> | | | | | P | P | P | P | | P | | P | P | P | P | P | P | P | P | 70 | 30 | |
| <i>Vicia cracca</i> | P | P | | P | | | P | P | P | P | P | | | | P | P | P | P | | 65 | | |
| <i>Angelica sylvestris</i> | P | P | | P | P | | P | | P | P | P | P | | | P | P | P | | | 65 | | |
| <i>Filipendula ulmaria</i> | | P | P | P | P | P | | P | | P | | | P | P | P | | P | | P | 65 | | |
| <i>Calystegia sepium</i> | | | | P | P | P | P | P | P | P | P | | | | P | P | P | P | | 65 | | |
| <i>Ranunculus repens</i> | P | P | | P | | | | | P | P | P | P | P | | P | | P | | P | 55 | 25 | |

| | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|----|
| Juncus inflexus | | | | P | P | P | | P | P | | P | P | P | | P | | P | | | | 50 | 10 | |
| Dactylorhiza praetermissa | P | | P | P | | | | | P | P | P | P | P | | | | | | P | | | 45 | |
| Kindbergia praelonga | P | P | P | P | | | | P | | | | P | | | P | | P | | | P | | 45 | |
| Lychnis flos-cuculi | P | | P | | | | | | P | | P | P | P | | | | | p | P | | | 40 | |
| Salix cinerea | | P | | | P | P | | | | | | P | P | | P | | | P | | P | | 40 | 85 |
| Iris pseudacorus | | | P | | | | | | P | | P | | P | P | | | P | P | | P | | 40 | 20 |
| Thalictrum flavum | P | P | | | | | | | P | | P | P | | P | | | | | | P | | 35 | 5 |
| Carex elata | P | | | P | P | | | | P | | P | | | P | | | P | | | | | 35 | 10 |
| Poa trivialis | | | | | | P | P | P | P | | | | | | P | P | | | | P | | 35 | 85 |
| Lythrum salicaria | | | | | | P | P | | | P | | P | | | | P | P | | | P | | 35 | 5 |
| Carex disticha | | P | | | | | | | P | | | P | | | P | | | | | P | | 30 | |
| Phalaris arundinacea | | | P | | P | P | P | | | | | | | | P | | | | | P | | 30 | 10 |
| Cerastium fontanum | | | | P | | | P | | | | | P | | | P | | P | | | P | | 30 | |
| Cirsium arvense | | P | | | | | | | P | | | | | | P | | | | | | P | 20 | 15 |
| Lathyrus pratensis | | | | | | | | | | | | | P | P | P | P | | | | | | 20 | |
| Carex panicea | | | P | | | | | | | | | | | | | | P | | | P | | 15 | |
| Carex remota | | | | | P | | P | P | | | | | | | | | | | | | | 15 | 10 |
| Bryum pseudotriquetrum | | | | | | | P | | | | | | | | | | P | P | | | | 15 | |
| Epilobium hirsutum | | | | | | | | P | | | | P | | | | | | | P | | | 15 | |
| Fissidens adianthoides | | | | | | | | | | P | | | | | P | | | P | | | | 15 | |
| Lycopus europaeus | | | | | | | | | | | | | | | P | | | | P | | P | 15 | 10 |
| Aneura pinguis | | | | | | | P | | | P | | | | | | | | | | | | 10 | |
| Pedicularis palustris | | | | | | | | | | P | | | | | | | | | | | P | 10 | |
| Deschampsia cespitosa | | | | | | | | | | P | | | | | | | | | | | | 5 | 25 |
| Valeriana officinalis | | | | | | | | | | | | | | | P | | | | | | | 5 | |
| Arrhenatherum elatius | | | | | | | | | | | | | | | | P | | | | | | 5 | |
| Rubus fruticosus | | | | | | | | | | | | | | | | | | P | | | | 5 | |
| Brachypodium sylvaticum | | | | | | | | | | | | | | | | | | | | | | | 20 |
| Carex acuta | | | | | | | | | | | | | | | | | | | | | | | 15 |

| | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--------------|------------|-------------|
| Carex riparia | | | | | | | | | | | | | | | | | | | | | | | 10 |
| Carex otrubae | | | | | | | | | | | | | | | | | | | | | | | 10 |
| Scutellaria galericulata | | | | | | | | | | | | | | | | | | | | | | | 70 |
| Geranium robertianum | | | | | | | | | | | | | | | | | | | | | | | 25 |
| Urtica dioica | | | | | | | | | | | | | | | | | | | | | | | 15 |
| Alliaria petiolata | | | | | | | | | | | | | | | | | | | | | | | 5 |
| Hypnum resupinatum | | | | | | | | | | | | | | | | | | | | | | | 5 |
| | | | | | | | | | | | | | | | | | | | | | | | Mean |
| Total Number Species | 20 | 22 | 19 | 25 | 22 | 21 | 25 | 25 | 26 | 27 | 22 | 26 | 26 | 21 | 27 | 22 | 27 | 21 | 24 | 21 | 23.45 | 9.3 | |

3.2.4 List of additional species outside of Plot N02

Part of the brief was to record a list of additional species recorded outside of the plot but within the floodplain habitat. These were:

Brachypodium sylvaticum
Carex acuta
Carex flacca
Carex lepidocarpa
Carex pseudocyperus
Carex riparia
Dactylorhiza incarnata incarnata
Epilobium palustre
Galium aparine
Galium palustre
Hydrocotyle vulgaris
Juncus articulatus
Juncus effusus
Lycopus europaeus
Epilobium parviflorum
Oenanthe lachenalii
Ranunculus acris
Ranunculus flammula
Salix fragilis
Scutellaria galericulata
Sonchus oleraceus
Stachys palustris
Taraxacum officinalis agg.
Urtica dioica

Lophocolea bidentata
Riccardia multifida

3.2.5 Commentary

Vegetation structure

The Plot is a relatively even sward of rushes and grasses with a diverse range of forbs but with a relatively consistent canopy height at around 40cm, produced by consistent annual mowing. At the base of the rushy sward is high cover of mosses, more than 50%, with patches of bare ground and some plant litter although mowing and raking limits this in extent and depth. There are some hummocks caused by old scrub roots. The shallow hollows have generally lower growing vegetation in wetter conditions, but there was no standing water. Patches of *Pedicularis palustris* also restricted height of growth.

Outside of the Plot there is an especially low swampy hollow, dominated by large sedges especially *Carex elata* and *C. acutiformis*. Some old and higher mounds on sites of old stumps are dryer with some remnant tussocks of *Carex remota*.

Floristics

This is a diverse area of fen meadow, dominated by *Juncus subnodulosus*, but not overwhelmingly so, with a wide range of fen herbs associated with the rushes. Particularly characteristic are constants and frequent species in the top half of the plot table above, placing this community clearly in M22 *Juncus subnodulosus-Cirsium palustre* fen meadow, *Iris pseudacorus* sub-community, perhaps intermediate with the *Carex elata* sub-community. Grasses can be frequent but not especially abundant, with most typical species being *Holcus lanatus*, *Agrostis stolonifera* and *Festuca rubra* with the fen reeds *Phragmites australis* and *Phalaris arundinacea* also frequent. Within the mix are a very wide range of fen herbs including *Dactylorhiza praetermissa* and *Pedicularis palustris*. The ground layer is dominated by the wetland bryophyte *Calliergonella cuspidata* but there are also infrequent records for uncommon fen species such as *Bryum pseudotriquetrum*, *Fissidens adianthoides* and *Aneura pinguis*. The dryland mosses *Brachythecium rutabulum* and *Kindbergia praelonga* can be frequent, especially where there is slightly drier ground, but they rarely attain high cover.

The sward is species-rich with a mean number of 23.45 species per 1m² quadrat.

Outside of the plot, a wide range of additional species have been recorded. Most of the species recorded in the Plot in 2017 but not in 2022 can still be found outside. The list includes some uncommon fen species such as *Carex lepidocarpa*, *Dactylorhiza incarnata incarnata*, *Carex pseudocyperus*, *Oenanthe lachenalii* and the uncommon fen liverwort, *Riccardia multifida*.

Since 2017 the plot has improved enormously following scrub removal and restoration mowing. Scrub trees are now very rare while fen meadow species have all increased in frequency. Many of the uncommon fen species have been recruited to the plot since 2017. There has been a substantial increase in richness since 2017 when the mean number per quadrat was 9.3.

Summary of records and events

The Plot was cleared of dense scrub prior to 2017, but some had regrown from stools and from regeneration, with willow being recorded as constant and in most quadrats and shown in some photos (Stone 2017). Oddly, woody seedlings and saplings were rated at 0% cover and zero height in the Quadrant tables. Since 2017 there has been more comprehensive clearance and annual mowing and raking, which accounts for the development of the high quality fen meadow flora.

Relation to past and target conditions

The site has improved and meets the objectives for fen meadow. With continued mowing management it can only improve.

4. CONCLUSIONS AND RECCOMENDATIONS

The Peaty Floodplain community (N02) has been subject to restoration work – scrub removal and mowing – and has been transformed from scrubby remnant fen in 2017 to a high-quality stand of M22 *juncus subnodulosus-Cirsium palustre* fen meadow. It is very species rich and includes some uncommon rich-fen plants. The wider area of fen meadow in which it sits includes additional uncommon fen meadow species and is developing well. There are areas of *Carex acutiformis* and *Carex elata* swamp in hollows.

Current management should continue and will see further improvements in species richness and representation of uncommon species.

The plot on the Sandy Terrace, N01, was difficult to relocate and there is uncertainty as to whether the plots in 2017 and 2022 are coincident. Regardless, it is very clear that what was once predominantly a disturbed and ruderalised species-poor grassland has developed rapidly into mostly scrub with some remaining grassland. The stand is dominated by *Cornus sanguinea* or by rank competitive grasses and holds no species of conservation interest. It appears not to have been managed since 2017 and is progressing rapidly towards woodland.

There seems little value in re-recording the Sandy Terrace Plot N01 in the future. If monitoring is to be continued it should be re-marked with clear permanent posts, and a decision on management objectives taken.

Plot N02 Peaty Floodplain should be re-recorded in 2027. A five-year resurvey is ideal.

5. REFERENCES

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