

Yorkshire Water Biodiversity Fund

Expanding priority habitats in the Lower Ure Valley
(Tranche 2)

Update: June to September 2022



A second tranche of funding has been generously provided by Yorkshire Water for the Lower Ure Conservation Trust's work to expand priority habitats, extending from June 2022 to May 2024. This report summarises work undertaken during the past four months.

Rare plant projects

Propagating and establishing ark populations of Priority wetland plant species is an important focus of the project.

We obtained further propagation material of **Tubular Water-dropwort** from a site in the Vale of York. We now maintain a population in the nursery and plants have been provided to two suitable pond clusters within the historic range of the species (new Great Crested Newt mitigation ponds at Huby in the Vale of York and near Kirkby Misperton in the Vale of Pickering). This species was introduced to Flasks Fen in 2021 but after flourishing initially, low water levels and rabbit grazing have reduced the size of the population. Tubular Water-dropwort has also been introduced to the Newt Pond at Nosterfield Quarry.

Four of us visited Foxglove Covert Nature Reserve at Catterick Garrison in late July to search for seed capsules of **Marsh Stitchwort**. This required meticulous work as the plant had finished flowering and we needed to ensure that plenty of capsules remained in situ. Eventually a dozen were collected but all were subsequently found to be infected with a smut fungus, so yielded no viable seed. It's unclear if this is a common occurrence in Marsh Stitchwort. We will look to obtain permission to collect seed from other sites in 2023 (probably Strensall Common SSSI and the Lower Derwent Valley National Nature Reserve).



While at Foxglove Covert, we obtained a sample of **Pillwort** for propagation – there are extensive stands of this rare fern-relative in new ponds on the reserve though the original location would benefit from more active management.

In September, we received a long-awaited Natural England licence to collect **Water Germander** (← photo) from Kingfishers Bridge in Cambridgeshire. This Endangered plant formerly occurred at Bolton-on-Swale in North Yorkshire, and we intend to establish a cultivated population at the nursery – partly for education purposes and partly to investigate propagation techniques so that re-introduction might be considered in due course. Kingfishers Bridge is one of only three wild sites for Water Germander in Britain, the population being a highly successful introduction from a nearby wetland.

Seed collection and propagation facilities

We held seed-collecting visits to Staveley YWT reserve, East Tanfield and other sites on the magnesian limestone, Foxglove Covert LNR and a privately-owned fen near Masham. Several new species have been sown as seed or cultivated as cuttings including Broad-leaved Pondweed *Potamogeton natans*, Curled Pondweed *P. crispus*, Water Violet *Hottonia palustris*, Pignut *Conopodium majus*, Soft Downy-rose *Rosa mollis* and Burnet Rose *R. spinosissima*.

Tanks and water beds intended for aquatic and semi-aquatic plants have had mixed success. Algal growth has been a problem, with submerged aquatics becoming coated with epiphytic algae. This is probably due to fertiliser in the compost, so we have removed plants, re-potted in sharp sand only and placed in temporary facilities while better ones are designed.

Display garden

Work on the display bed at the nursery began in spring and was completed in June. This showcases some of the plants which have been lost from or are under threat in the Swale and Ure Washlands. Plants include Great Fen Sedge, Slender Sedge, Marsh Fern, Meadow Thistle and Tufted Loosestrife.



In late September, a low-nutrient pool was added. This is fed from a rainwater butt, hopefully providing amenable conditions for plants which require nutrient-poor conditions; such species have been at particularly high risk of extinction in the North Yorkshire lowlands. We have planted Cotton-grass, Slender Sedge, Floating Club-rush and Pillwort, with the intention of adding others in future. This pool will serve both as an educational feature and a propagation facility.



Magnesian limestone grassland project

Our magnesian limestone grassland project was launched with a webinar in early July (<https://www.luct.org.uk/yorkshire-water-biodiversity-fund-2>). Martin, our ecologist, explained what makes this habitat special, why it's so rare and why we need a site inventory. LUCT volunteers and others were invited to look out for characteristic limestone grassland plants in the target area and submit reports. A video of the webinar has been posted on YouTube (<https://www.youtube.com/watch?v=GYM18IEvS6M>).

Survey responses have mainly identified road verges but a previously unrecorded example of ancient magnesian limestone pasture was identified in the Ure valley downstream of Masham. A particularly rich verge on Moor Lane near Thornton Watlass proved to be of County Wildlife Site quality but would benefit from management to reduce scrub encroachment; this is currently being pursued. This verge is likely to be a relic of once-extensive calcareous grassland on Watlass Moor. Further survey work will be undertaken in spring/summer 2023.

At Kiln Lake, Tarmac staff kindly helped extend the grassland creation area on the magnesian limestone, using a 40 tonne excavator to scarify the hard rock surface to create rubble soil. Monitoring of plots established since 2020 shows that Rabbit grazing is the principal limiting factor in establishing grassland here, so we're currently looking at the feasibility of electric fencing. Local seed has been collected by hand for use on the limestone.



Extension of the magnesian limestone creation area at Kiln Lake, July 2022

Visits to the nursery and Flasks Fen

We have hosted visits by the Garganey Trust (who manage wetland in the Dearne Valley in South Yorkshire), the Wild Ingleborough Project, the Mid-Swale project officer of the Yorkshire Dales Rivers Trust. Tarmac staff, councillors from the new North Yorkshire Council and the High Sheriff of North Yorkshire.

Management of County Wildlife Sites

Management of County Wildlife Sites has included:

- mowing St John's Churchyard at Sharow (the seed-rich hay was spread on the Hay Field at Nosterfield Nature Reserve as part of our efforts to restore lowland meadow priority habitat)
- mowing Theakston Lane near Richmond: species-rich areas were mown in July and again on 20th September, when the remainder of the CWS was cut. Hay from the first cut was spread on new meadow plots at Flasks Fen.
- mowing of densely rush-dominated areas on a privately-owned CWS fen in lower Wensleydale
- monitoring surveys at Theakston Lane and the lower Wensleydale site

Work is planned at two other CWS during the winter months.



Fen management in lower Wensleydale

Habitat creation

We assessed the survival of individual plants for the fourth year running in our monitoring transect. This will be the last time this is feasible, since it's increasingly difficult to distinguish original plants from rhizome growth. The results demonstrate that keystone fen plants can be successfully established in this challenging environment as long as initial protection against grazing is provided. Locally-distinctive species such as Great Fen Sedge, Tufted Sedge and Blunt-flowered Rush have performed particularly well.

<i>Species</i>	<i>English name</i>	<i>No planted</i>	<i>No Yr 4</i>	<i>% survival</i>
<i>Cladium mariscus</i>	Great Fen Sedge	20	20	100
<i>Caltha palustris</i>	Kingcup	5	5	100
<i>Mentha aquatica</i>	Water Mint	20	19	95
<i>Carex elata</i>	Tufted Sedge	19	18	95
<i>Phragmites australis</i>	Common Reed	14	12	86
<i>Iris pseudacorus</i>	Yellow Flag Iris	7	6	86
<i>Juncus subnodulosus</i>	Blunt-flowered Rush	27	20	74
<i>Calamagrostis canescens</i>	Purple Small-reed	8	4	50
<i>Molinia caerulea</i>	Purple Moor-grass	9	3	33
<i>Succisa pratensis</i>	Devil's-bit Scabious	8	2	25
<i>Valeriana dioica</i>	Marsh Valerian	4	1	25
<i>Filipendula ulmaria</i>	Meadowsweet	19	4	21
<i>Eupatoria cannabinum</i>	Hemp Agrimony	23	0	0
<i>Carex panicea</i>	Carnation Sedge	4	0	0
<i>Thelypteris palustris</i>	Marsh Fern	3	0	0

Great Fen Sedge is clearly the most successful species in ‘wet’ fen (i.e. in water up to 30 cm deep in summer) but also does well in surface-dry locations where the deep roots will remain in contact with groundwater. Within a couple of years of planting, *Cladium* flowers and fruits well, grows vigorously and produces plentiful new shoots. Once established, it holds its own against Common Reed and other tall swamp competitors, while grazing does little harm to mature plants.

We know from paleoenvironmental evidence that Great Fen Sedge was once abundant in the extensive fens which developed in late glacial/early Holocene lake basins in the Swale & Ure Washlands, and fruits are prominent in late medieval peat profiles from Sharow Mires near Ripon. It occurred historically at Scriven, Staveley Carrs and Newsham Carr and survives at two further locations. We can thus be confident that Great Fen Sedge is an indigenous and strongly characteristic plant of natural wetlands in central North Yorkshire. Our work at Flasks Fen shows that restoring significant areas of *Cladium* fen is a realistic prospect, even on mineral sites with moderately eutrophic water and other challenges such as *Crassula helmsii* invasion and large goose populations. We have already collaborated with the Yorkshire Wildlife Trust to introduce Great Fen Sedge and associated species such as Tufted Sedge to the fringes of newly-created reedbeds at Ripon City Wetlands, and we’re working with the managers of another mineral site in the Lower Ure Valley to incorporate species-rich reedfen into their restoration plan. We’re also planning to replant *Cladium* and Tufted Sedge in areas cleared of invasive Red-osier Dogwood at Sharow Mires, one of our sources of propagules.



Newly planted stand of Great Fen Sedge at Flasks Fen, September 2022

With these results in mind, we have focussed on planting Great Fen Sedge in unvegetated areas in the northern part of Flasks Fen. While it was originally envisaged that an area of open

water would be maintained here, low lake levels mean it had become dominated by deep carpets of *Crassula helmsii*. Once established, we believe Flasks Fen will support the largest area of Great Fen Sedge swamp in Yorkshire!

We've also continued inter-planting the fen meadow plots. These have suffered from rabbit and Roe Deer grazing, despite our best efforts. While this is unlikely to be detrimental in the long run, it's frustrating that many flowerheads and seedheads have been grazed off, reducing seed production. Even Marsh Thistle was heavily browsed and some species like Marsh Valerian failed to yield a single seedhead despite healthy vegetative growth. On the other hand, Purple Small-reed and Blunt-flowered Rush show vigorous vegetative spread. One species, Tufted Sedge, shows signs of nutrient and/or moisture stress, presumably due to low lake levels and lack of groundwater throughput during the hot, dry spring and summer.

We must be philosophical about grazing damage: in the long run, rabbits and deer should help curtail Common Reed growth, which is likely to become an important management challenge. There are already signs that low-level browsing is helping maintain a well-structured species-rich reedfen plot planted in May 2020. This shows an excellent mosaic of tall 'reeds', tussocks, mid-sized sedges and rushes and low growth with markedly reduced spread of *Crassula helmsii* (see cover photo).

Shoreline planting to the west of the nursery suffered initially from goose grazing, so dead hedging was constructed in August. This seems to be an effective deterrent, as Greylags like to swim to the shore from open water and rarely fly in. Replacement planting of Bladder Sedge, Tufted Sedge and Cyperus Sedge has been carried out. This connects Flasks Fen to the Newt Pond.

A limited amount of Common Reed planting was undertaken along the Causeway bank of Flasks Lake.

Potentially, direct seeding offers a cheaper alternative to planting in wetland creation. We established two small plots in summer 2021, on silt banks. These were roughly cultivated and sown with hand-collected seed from local fens. One sown with seed from Langthorne New Covert became rather parched during the hot, dry summer, resulting in the loss of Yellow Flag and Meadowsweet seedlings. However, Purple Moor-grass grew well. The other plot was less well protected and suffered badly from Rabbit digging. While this wasn't a success, at least five species germinated including Wild Angelica, Meadowsweet, Purple Moor-grass, plentiful Hemp Agrimony and a single plant of Marsh Valerian.

After we improved the fencing layout, a new plot was levelled, cultivated and seeded at the end of September. Locally-collected seed of 12 fen species was sown.



Plot sown with hand-collected seed from Langthorne New Covert, September 2022:
note the abundance of Purple Moor-grass seedlings

Based on four years' results, we're confident that the following plant communities can be established using local-provenance plants on aggregate quarry silt deposits:

- Tufted Sedge swamp (coded S1 in the National Vegetation Classification)
- Great Fen Sedge swamp (NVC S2)
- Species-rich reedfen (a northern version of NVC S24)
- Purple Moor-grass fen-meadow (NVC M24)
- Meadowsweet – Wild Angelica mire (NVC M27)

Use of Flasks Fen by wildlife



We monitor use of newly-created fen habitat by wildlife. Surveys of Odonata have recorded a wide range of dragonflies and damselflies, including Lesser Emperor, a rare visitor. Willow Emerald damselfly, a northwards-expanding species, was recorded from the Newt Pond in September. As well as wetland songbirds (Reed Bunting, Reed Warbler, Sedge Warbler) and Moorhen, Flasks Fen attracted its first breeding waders this summer: a pair of Oystercatchers fledged at least one young. Little Egrets feed daily and Kingfishers visit regularly.



Willow Emerald, a new damselfly for Nosterfield, at the Newt Pond in September 2022

East Dales Ringing Group trapped the Nursery Marsh four times in August, using net rides within the new wet woodland habitat. A total of 194 birds of 15 species were ringed. The number of warblers shows this habitat is a magnet for insectivorous songbirds, with a remarkable 47 individual Blackcaps and 34 Willow Warblers caught.

	Full grown	Pulli	Retrap/ Recoveries	Total
Nosterfield Quarry (restored area)				
Green Woodpecker	2	0	0	2
Wren	2	0	0	2
Dunnock	5	0	0	5
Robin	10	0	1	11
Blackbird	9	0	0	9
Sedge Warbler	5	0	0	5
Reed Warbler	14	0	2	16
Whitethroat	3	0	0	3
Garden Warbler	5	0	0	5
Blackcap	47	0	3	50
Chiffchaff	28	0	3	31
Willow Warbler	34	0	0	34
Blue Tit	12	0	0	12
Great Tit	7	0	1	8
Reed Bunting	1	0	0	1
Total for: Nosterfield Quarry (restored area)	184	0	10	194

Meadow enhancement

A 1.28 ha field of semi-improved grassland on Nosterfield Nature Reserve has been targeted for botanical enhancement as it is cut for hay in most years and has a favourable sward structure. After mowing in early July, half the field was lightly chain-harrowed to create small gaps in the sward then green hay from St John's Churchyard was spread.

Locally-collected seed of Meadow Vetchling, Common Bird's-foot Trefoil, Common Knapweed, Cowslip, Pignut and Bulbous Buttercup has been sown in the nursery with a view to planting out plugs in autumn 2023.

Further grassland enhancement has been undertaken on the reserve, on slopes adjoining the Northern Viewing Screen. Calcareous gravel grassland here supports abundant Cowslip, Fairy Flax and Bird's-foot Trefoil but as this habitat is the result of late 20th century quarrying, there have been limited opportunities for further species to colonise naturally. Ancient grassland on similar substrates at Thornborough Middle Henge provides a template for how the flora might develop in a less fragmented landscape, so we've planted Betony, Dropwort and Dyer's Greenweed, all grown from local sources.

Two additional areas of lowland meadow habitat have been created as part of Flasks Fen: a small strip adjoining the existing meadow plot (which was established in 2020) and an area at the northern end of the Fen. The former was sown in July with hay from Theakston Lane CWS and hand-collected seed. Initial germination has been dominated by Ribwort Plantain. The latter was sown originally in 2021 but mainly non-grassland species have established and this plot was over-sown with green hay from Theakston Lane.

Volunteering

LUCT is committed to delivering at least 7,000 hours volunteering as part of this project. The volunteer hours from 01/06/22 to 30/09/22 total 2130hrs, broken down approximately as follows:

Nursery: 470hrs

Other practical work (inc. planting): 720hrs

Surveys/monitoring: 195hrs

Trustees: 550 hrs

Other (work exp/corporate work parties/community days): 130hrs

Bird recording: 65hrs
