Wyre Forest Study Group

Wyre Forest Flushes - 2025

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We have now completed the first phase of a long-term project to describe the variety of the smallish wet areas in the Wyre Forest collectively known as flushes. This phase began in 2023 and aimed to plot the position of all these small wetlands. No definitive boundary has yet been set for which woodlands are within the wider Wyre Forest, and work has focused on the central block of woodland owned in the main by Forestry England and Natural England, with a smaller but significant area in the ownership of the Guild of St George (Figure 1).

While the phase 1 survey started with just Study Group members, an opportunity arose in November 2024 to apply for a Natural Network grant, administered by Worcestershire County Council. The grant provided 70% of the project cost and the Natural England team in the NNR contributed the other 30%. The money was used to engage Cesca Beamish, a plant ecologist, to extend the search for flushes to the whole of the NNR area. Due to a land ownership change it was not possible to survey the Bells Coppice part of the NNR, so an equivalent area of the Guild of St George land, managed by the Wyre Community Land Trust, was surveyed instead. As required by the grant administrators, the work was completed and reported on before the end of February 2025.

Each flush is usually made up from more than one vegetation type, as the effect of the water source diminishes with distance, and may be affected by the degree of slope or by ponding. At this stage, it was not possible to explore the 'intra-flush' diversity, so the next best thing was to compile a total plant list for each. It included a crude scale of abundance for each species. It lumps together species found in the usually small groundwater discharge area, land around it kept damp by the flushing, sump or water track, and even some plants of the surrounding woodland. Nevertheless, key features such as base-richness and tufa formation was still evident within the plant list and it is presented as a valid method for a coarse breakdown of flush types.

The dataset was sorted into groups using a computer-based program TWINSPAN, in which it is repeatedly divided into two parts, based on positive and negative indicator species, as calculated by the program. The tabulated output is validated by comparing it with a mental picture of how flush vegetation varies, built up by the surveyors as the survey progressed. The computer program does not have any in-built ecological rationale for dividing the dataset and can be used with equal validity to classify any other sort of data, such as postage stamps or cheeses.

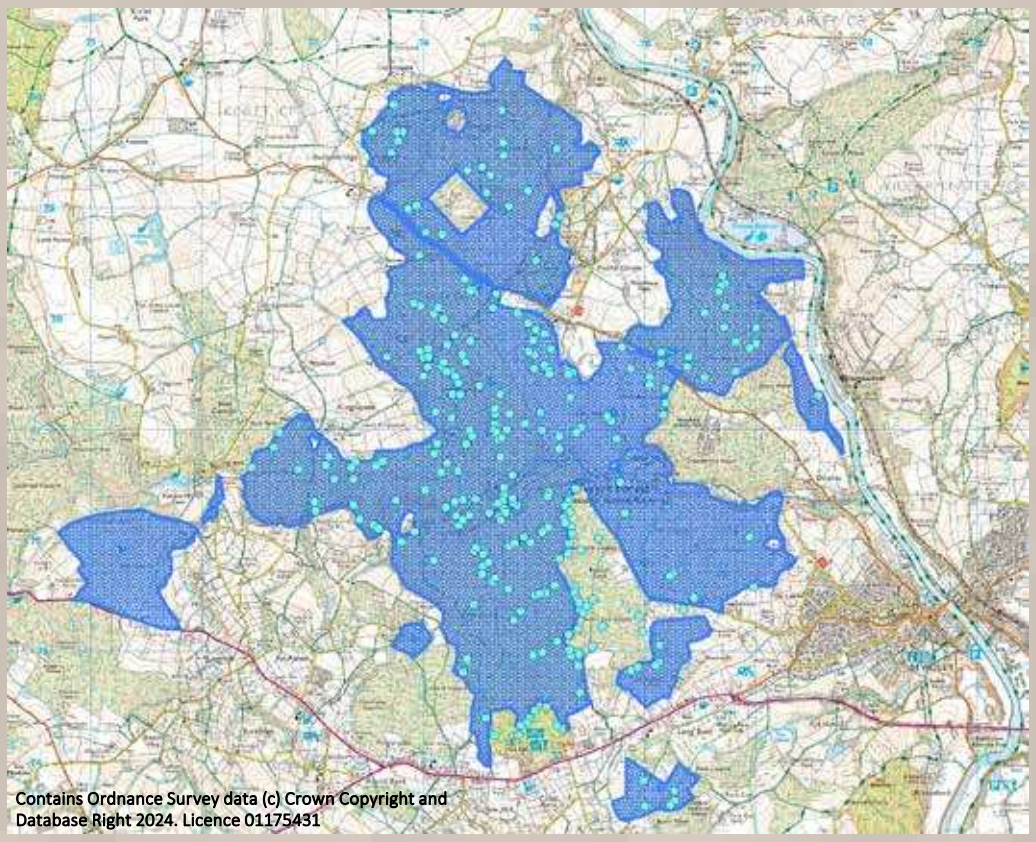

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Figure 1. Location of flushes in the National Nature Reserve and in the wider Wyre Forest.

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Nine flush groups were chosen for description from the TWINSPAN division of the plant lists. Each had distinguishing features based on the dominant plant or plants, and the prominence of species with strong hydro-chemical associations, particularly those associated with base-rich conditions. When plotted, each had a characteristic distribution, whether restricted to a particular geographical location, or widely scattered throughout. The initial breakdown of flushes provides a sound basis on which to choose example for a detailed study in Phase 2 of the project.

The nine flush types

These are described in Meade & Beamish (2025) and these are just some of the main features. *Carex pendul*a is a frequent species, occurring in all but one of the flushes of Group 1. Where weak or absent it may be replaced by *Carex remota*, *Juncus effusus* or *Deschampsia cespitosa*. Bare ground cover was not recorded, but it is possible that this was also a major feature where no plant species is at least Abundant. The Pendulous Sedge is widespread, and is found in other groups as well, so its presence alone is not diagnostic for Group 1 (Figure 2).

While base-indicative mosses such as *Palustriella commutata* and *Cratoneuron filicinum* are rare in Group 1, they are abundant in Group 2 (Figure 3). They are of particular interest to Study Group members because they support a range of shelled molluscs. In broad conservation terms they are close to the definition of the Natura 2000 'Petrifying springs capable of tufa formation' category, relatively rare in Europe. To quote the Google AI Overview "These are highly specialised,



Figure 3. Group 2 flush with prominent mosses associated with base-enrichment. Roger Meade

threatened European ecosystems where calcium-rich water deposits travertine (tufa), creating unique moss-dominated communities, rich in rare plants like Bird's-eye Primrose. Protected under the EU Habitat Directive, these springs are crucial groundwater-dependent habitats, but face threats from pollution (especially nutrient enrichment), hydrological changes, and management conflicts with adjacent fens, leading to various EU LIFE projects and national conservation efforts across Europe."

Other groups have very little plant cover at all, such as in Group 3. Remote Sedge *Carex remota* forms often the only noticeable representative (Figure 4), though as a species it is also distributed amongst most other groups.

It would be easy to dismiss these as of little interest due to the sparse plant cover. It is a challenge to



Figure 2. A Group 1 flush with dominant Pendulous Sedge. Roger Meade



Figure 4. Bare ground is characteristic for many Group 4 flushes. Roger Meade

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Study Group members to see if they provide a home, for example, to rare invertebrates.

In addition to Pendulous Sedge, rushes are also common in most groups. The most widespread is Soft Rush *Juncus effusus*, but Sharp-flowered Rush *J. acutiflorus* can be dominant, especially on a type of flush mostly restricted to the open grassland of the buried aqueduct, assigned to Group 9. A rush-dominated example from Group 4 is shown in Figure 5, and its association with Sphagnum mosses in Figure 6, providing a very different habitat from Group 2.

There are other dominant plants, one being Purple Moor-grass *Molinia caerulea*, although the same species is scattered as a few tussocks amongst several flush groups. Given that the analysis is based on a single species list for each flush, it will include species from more than one stand of vegetation. Phase 2 of the project is designed to disentangle the lack of precision introduced by this pooling of the species list.



Figure 5. A rush-dominated flush of Group 4. Roger Meade



Figure 6. Sphagnum mosses amongst Soft Rush in Group 4. Roger Meade

Where do we go from here?

One of the aims of the project is to relate flush types to geology and topography, another to provide a framework within which species records gathered by the Study Group can be enhanced by a knowledge of their habitat.

From the start, one of the objectives was to map the flush outline, and those of its component vegetation stands. This fell at the first hurdle in that an ordinary hand-held GPS was insufficiently accurate under trees to give precise grid coordinates. Since then, one flush has been mapped using bearing and distance with an automatic level (Figure 7), with the bonus of it recording differences in elevation as well. The outcome is a three-dimensional appreciation of the flush and its layout.

The mapping of Flush 86 shows that using bearing and distance from an instrument position provides a coherent map, whereas the same points determined with a GPS do not. A mean of several GPS readings was used to establish the location of the instrument position. This flush is on relatively flat ground with very little variation in elevation. However, some flushes are on steep slopes, with intervening scrub, so it remains to be seen if this method can be applied to all.

In Figure 7 the flush has been divided into three different stands of vegetation. The whole was too dry in July 2025 for plants to be identified with confidence, so no quadrats were recorded. When normal wetness has returned, quadrats will be recorded in each of the three stands so that all the accumulated quadrats can be related to National Vegetation Community types, and divided into groups as was done in Phase 1. There are still 24 flushes to map and record quadrats in 2026 (Figure 8). These have been chosen to represent the nine groups and to be spread over the whole study area.

Reference

Meade, R & Beamish, F. 2025. *Describing the Wyre Forest Flushes. Assessment of Phase 1 Survey.* March 2025.

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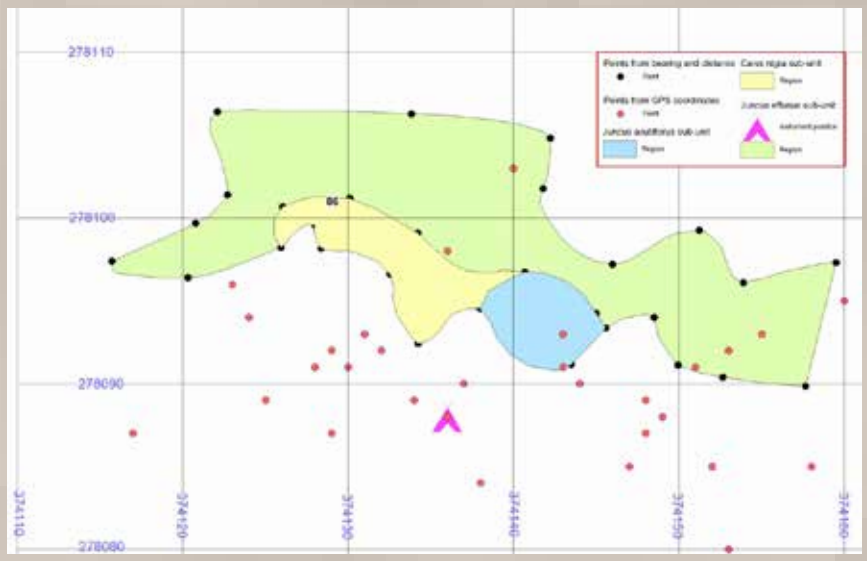

Figure 7. Mapping Flush 86 using an automatic level and a GPS.

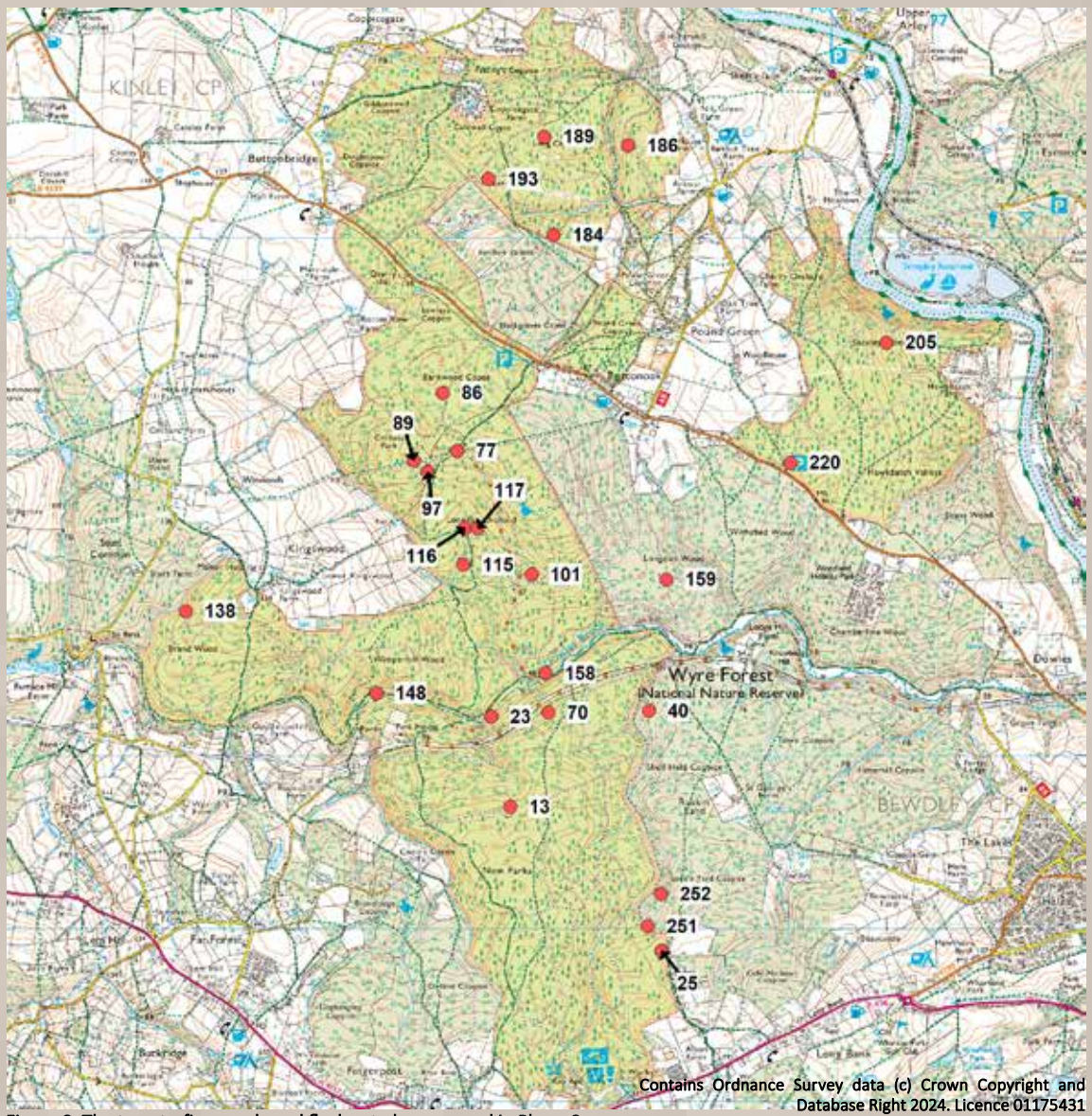

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Figure 8. The twenty-five numbered flushes to be surveyed in Phase 2.