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**The discovery of *Alopecurus borealis* and *Carex vaginata* in the Yorkshire Dales (v.c. 65) with observations on *Saxifraga hirculus***

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On 23rd July 2007 I went up Great Shunner Fell, the third highest mountain in the Yorkshire Dales, to see the *Saxifraga hirculus* (Yellow Marsh-saxifrage) flushes. I was keen to see their condition, as I had recently been told they had been ungrazed for the last 8 - 12 years. I approached the fell from the east and walked round the spring line just below the summit, when, to my surprise, shortly after crossing the Pennine Way at the southern end, I came across a patch, approximately 30m x 30m, of *Carex vaginata* (Sheathed Sedge), a species only recently discovered in England by Rod Corner in 2002 in the northern Pennines (Corner, 2004). This was the first record for v.c. 65 away from Mickle Fell in the Pennines where it was found by Dr. Corner, Jeremy Roberts and myself on the northern and southern slopes of the fell in 2005 (Corner et al., 2006).

The western edge of Great Shunner Fell has some good calcareous flushes and here the best and most amazing find of the day was a flush with about 200 flowering heads of *Alopecurus borealis* (Alpine Foxtail), a new record for v.c. 65 (see Colour Section, Plate 1). This extends the British range of this species and the Sheathed Sedge by 26km (16 miles) southwards, which more than doubles their previously known ranges in the northern Pennines. Tolmachev et al. (1995) state that the Alpine Foxtail's range extends south to 56° N in Arctic Labrador. The latitude of all the Pennines sites is less than 56° N, but the Great Shunner Fell site is now the most southerly in the world, at latitude 54°22' N.

Still on the western side I visited the *Saxifraga hirculus* flushes. The southern-most one was in a reasonable condition, with quite a few basal shoots in evidence and a good number of flowers. The northern flush is much smaller and was very overgrown with large cushions of moss and *Saxifraga hypnoides* (Mossy Saxifrage) up to knee height. There were no basal shoots visible and only nine flowering stems. I think this flush is probably in its final stages of existence due to lack of grazing, build up of litter and shading out by the Mossy Saxifrage.

Some research done by Michael Rawes and David Welch (Welch & Rawes, 1964) in the 1950s and 1960s on Moor House National Nature Reserve in the northern Pennines on the effects of excluding sheep grazing from high level grasslands, mentions a small 2m x 2m enclosure being erected on part of a *Saxifraga hirculus* flush up Moss Bum. For the first three to four years the plant seemed to do very well, but three years after that it had disappeared completely. A larger enclosure known as Johnny's Flush in the same area had a very good *Saxifraga hirculus* flush running through it. Here too the species has disappeared (pers. comm.: Dr M.E. Bradshaw), and the enclosure is now very overgrown; species like *Geum rivale* (Water Avens) and *Filipendula ulmaria* (Meadowsweet) doing very well in its place.

*Saxifraga hirculus* flushes do need reasonable levels of grazing and trampling to open up the sward and reduce competition, to maintain and keep them in good condition. The flushes have withstood quite high grazing levels in the past and it is noticeable how sheep tend to congregate on them; indeed Dr Corner and I have noted that when you see a high-level flush in the Pennines with a good number of sheep on it, the Saxifrage is often present.

