

## **Mid-Holocene Charcoal Fall in Southern Scotland**

Based on Tipping, R. and P. Milburn (2000) Mid-Holocene charcoal fall Southern Scotland – River Annan and Nith in Dumfriesshire *Palaeogeography, Palaeoclimatology, Palaeoecology* 164: 177-193

### **Introduction**

British Mid-Holocene stratigraphies have recorded, mostly in upland areas, a reduction in charcoal. This is described as the 'charcoal fall', which may represent changes in the spatial patterning of land use as humans adopted agriculture. Hunter-gatherers are often recorded as using fire to improve grazing quality. Alternatively, climatic controls could have affected forest fires causing a reduction in charcoal. Another possibility is that Neolithic activities may have become increasingly concentrated in lowland areas and the uplands were abandoned or managed by grazing rather than fire.

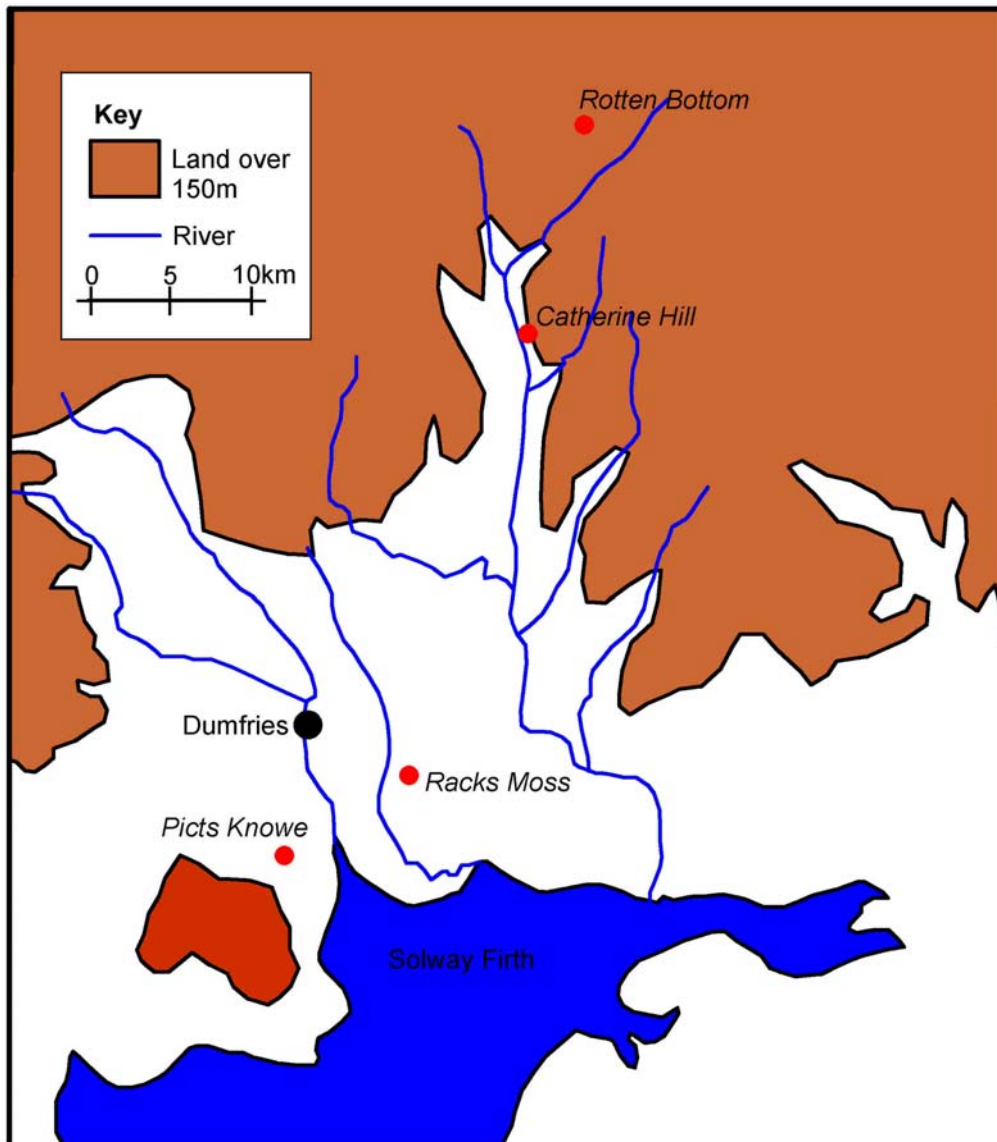
### **Methodology**

Temporal changes in charcoal stratigraphies were examined in upland and lowland settings in south-facing catchments. This included high-altitude blanket peat at Rotten Bottom, a piedmont basin peat at Catharine Hill, a lowland raised moss at Burnfoothill Moss and a coastal valley-floor peat at Pict's Knowe (Figure 1). The sites have a well established radiocarbon chronology. The fire frequency was related to climatic change by measures of the past groundwater using quantitative measures of peat humification through colorimetry.

### **Results**

At the plateau of Rotten Bottom no evidence of local fires occurred until 5500BP when total numbers of charcoal fragments start to increase. No evidence exists for a charcoal fall and humification data suggests wet ground conditions before 6200BP.

At the base of the southern uplands at Catharine Hill charcoal fragments were more common than at Rotten Bottom especially between 7000 and 6400BP. From 6400BP to 6200BP there are abrupt reductions to total charcoal fragments and from 6200BP until after 5000BP little evidence suggests fires were occurring around Catherine Hill. This site does contain evidence for a charcoal fall.



**Figure 1: Location of the study areas around the Solway Firth in Scotland.**

At the poorly drained lowland region of Burnfoothill Moss colormetric analyses indicate dry conditions at 6600 to 6300BP and 5800 to 5400BP. An increase in total charcoal fragments after 6400BP until 5600BP was related to bog surface aridity. The largest charcoal fragments are most abundant before 6300BP suggesting that, although rare or of low intensity, fires were close to or perhaps on the bog surface. Increasing total abundance of charcoal broadly relates to a diminishing importance of large fragments. Perhaps fires were more common or more intense in this later phase but not local to the moss. Slightly increased burning between 6400 and 6200BP may be associated with a drier peat surface. A reduction in total charcoal fragments is seen after 5400BP. This charcoal fall coincides with a wetter peat surface.

The low-lying narrow peat filled gully adjacent to the Neolithic to Late Iron Age site of Pict's Knowe has wet periods from 7000-6500BP, 5860-5600BP and after 5150BP. Total numbers of charcoal fragments increase at around 6800BP despite wetter ground conditions and a clear fall to very low numbers of charcoal fragments occurred at 6100BP.

### **Conclusion**

Three of the four sites show good evidence for relatively high numbers of charcoal fragments after 7000BP. These are all lowland sites. Charcoal abundance in the later Mesolithic is high irrespective of dominant soil drainage.

The upland site of Rotten Bottom provides evidence for increasing charcoal abundance in the early Neolithic around 5500BP. This may have been induced through the local expansion of vegetation types prone to burning and cannot be assumed to be typical of the Southern Uplands.

The charcoal falls in this region are not seen as products of climate change because the inferred shift in climate is to one of greater aridity and presumed heightened fire sensitivity. A simplistic distinction between hunter-gatherer and farming communities cannot be made because the charcoal fall at Catharine Hill occurred at 6450BP within the later Mesolithic.