Harthope Burn, Northumberland

[NT 961 230]

Highlights

Harthope Burn is an upland stream in the Cheviot Hills, where dramatic flood-related river-channel change has been elucidated using cartographic evidence and lichenometric analysis.

Introduction

The upper Harthope valley was the first site in north-east England (and indeed is still the only river system in the Cheviot Hills) where historical plan-form change in a cobble/boulder-bedded upland river channel has been documented using Ordnance Survey maps, aerial photographs and lichenometry (Milne, 1982). Harthope valley is an important site for an assemblage of recent coarse-grained flood deposits and associated channel forms.

Description

The site, investigated by Milne (1982), is a 750 m long reach of Harthope Burn [NT 961 230], a low-sinuosity, steep (0.01 m m^{-1}) boulder- and cobble-bedded stream (catchment area 14.8 km^2) in the Cheviot Hills (Figure 5.1). The historical floodplain (up to 100 m wide) is entrenched and inset within two low terraces (comprising coarse alluvial gravels) 4.4 and 2.5 m above the present stream bed (Figure 5.22). Valley sides are steep and mantled with soliflucted till. River-related land-forms on the floodplain include arcuate depressions marking former channels and prominent relict mid-channel bars composed of cobbles and boulders.

Since 1897, historical map evidence shows a reduction in both reach sinuosity (a result of a series of low-sinuosity chute cutoffs during a major flood dated by lichenometry to the early 1930s) and mean channel width (Figure 5.22). In recent decades there has been an increased tendency towards braiding of the channel. Mid-channel bars, chutes and sloughs, typical bed and channel forms of an active gravel-bed channel experiencing irregular episodes of lateral migration, are well-developed.

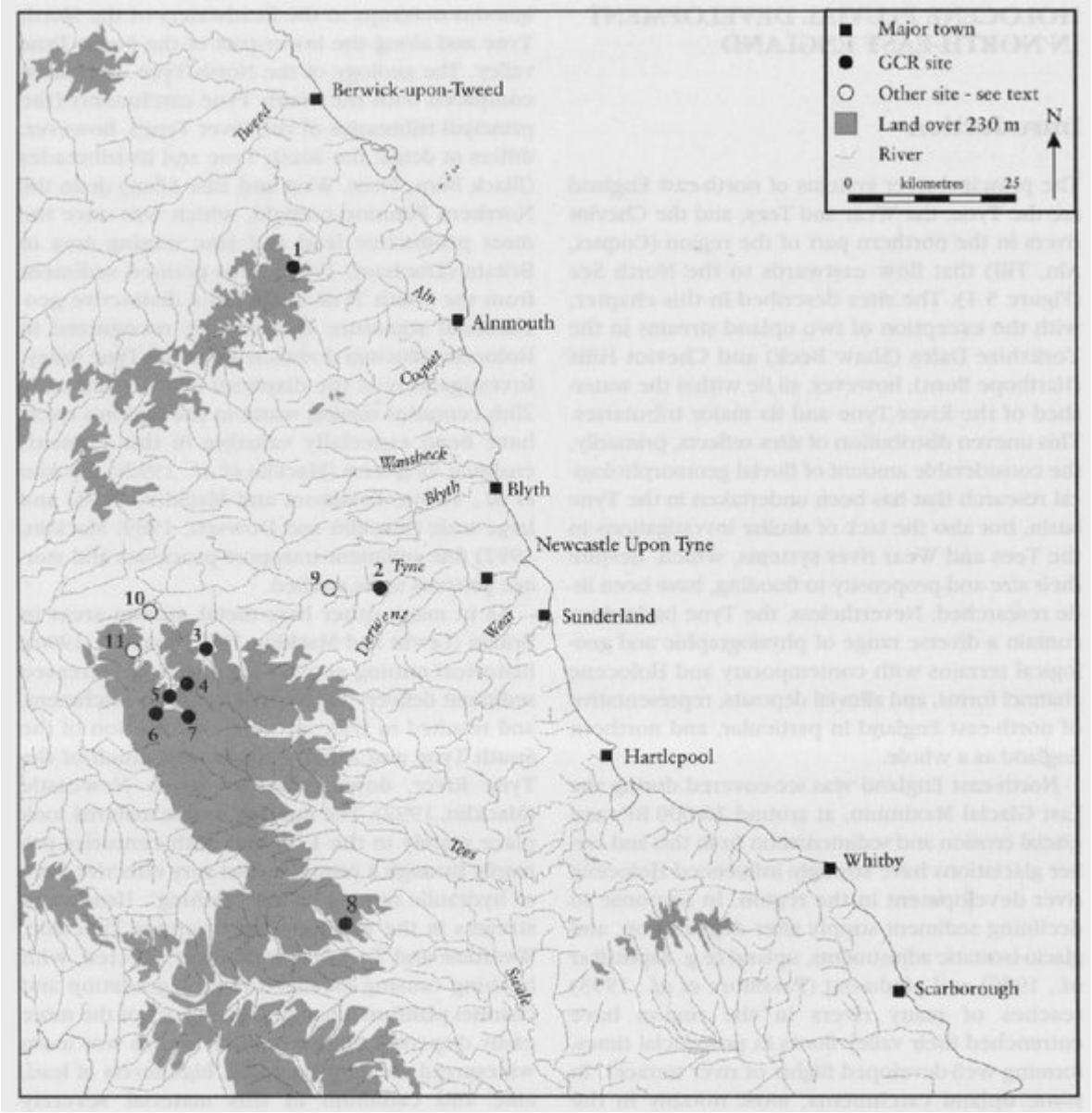
Interpretation

Harthope Burn is a site important for its particularly well-developed contemporary and historical coarse-grained alluvial deposits and landforms. These compare with channel and bar forms found in boulder- and cobble-bedded streams in the Northern Pennines (e.g. Black Burn, Macklin, this volume), the Lake District, the Bowland Fells (Harvey *et al.,* 1979) and parts of the Scottish Highlands (McEwen and Werritty, 1988). Alluvial terraces of probable Holocene age are also found in the reach. These would repay investigation, as studies elsewhere in the Cheviots (Macklin *et al., 1991;* Tipping, 1992) have shown that natural and human-induced environmental change, particularly during the late Holocene, has had a marked impact on valley floor development in the region.

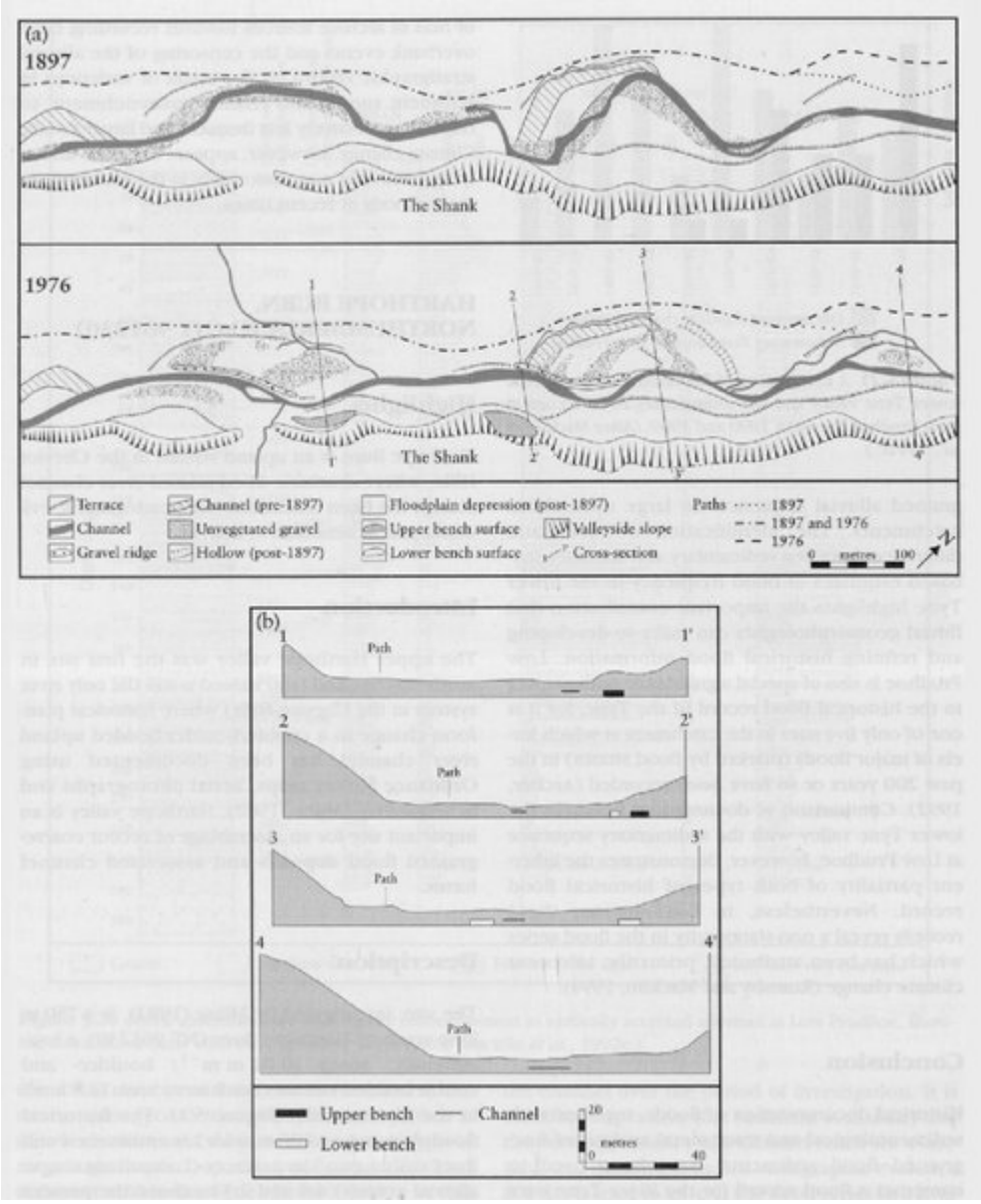
Conclusion

Harthope Burn is a steep, boulder- and cobble-bedded stream in the Cheviot Hills which has particularly fine examples of contemporary and historical bar and channel-forms, recent coarse-grained flood deposits and Holocene river terraces. The channel changes have been documented using maps and lichen evidence.

References



(Figure 5.1) The major river systems and relief of north-east England. GCR Sites: 1 Harthope Bum; 2 Low Prudhoe; 3 Blackett Bridge; 4 Blagill; 5 The Islands, (Alston Shingles); 6 Black Burn; 7 Garrigill; 8 Shaw Beck. Other sites descibed in the text: 9 Farnley Haughs; 10 Lambley; 11 Thinhope Burn.



(Figure 5.22) The Harthope study reach: (a) the channel position in 1897 and 1976, and (b) the present valleyside and floodplain features. (After Milne, 1982).