# Lambley, River South Tyne

[NY 675 605]

Present GCR fluvial sites in the Tyne basin fall into two groups (Figure 5.1). First, there are those located within the Northern Pennine Hills (Blacken Bridge, River West Allen; Blagill, River Nent; The Islands, River South Tyne) where laterally active, near-braided channels are presently reworking their floodplains, and the linkages between historical metal mining and river sedimentation can be clearly demonstrated (Macklin, 1986; Macklin and Aspinall, 1986; Macklin and Lewin, 1989). The second group of sites, which includes Low Prudhoe and Farnley Haughs (not presently a GCR site) are situated in the lower part of the Tyne basin and comprise low-sinuosity, single-thread channels, characterized by vertical accretion of sands and silts, and relatively low rates of lateral channel movement (Macklin *et al.,* 1992a,c). The impact of mining on channel morphology and riparian vegetation is less obvious at these sites, but is recorded by high levels of lead and zinc in some alluvial units (Macklin *et al.,* 1994a).

There is, however, a third type of fluvial environment in the Tyne basin that may be termed 'piedmont rivers', which is presently not included in the region's GCR coverage but is well developed in the zone bordering the Northern Pennine uplands. River channels and floodplains in this so-called piedmont zone (*sensu* Newson, 1981) have, in many respects, morphologies and sedimentation styles intermediate to those of the other upland or lowland sites in the region. Their channel patterns generally resemble those of 'wandering gravel-bed rivers', as described by Church (1983), with channel division around overlapping active gravel bars and larger, relatively stable, vegetated islands. Late Pleistocene and Holocene age river terraces, often with palaeochannels preserved on their surfaces, are also a common feature of many valley floors in the Not thern Pennine piedmont zone and attest to long-term river instability in these reaches. The Lambley (NY6759) sedimentation zone (Macklin and Lewin, 1989) in the South Tyne valley is typical in this respect, and has been included in this review as an exemplar of piedmont river processes and dynamics (Passmore *et al*., 1993; Macklin *et al.,* in press).

The Lambley site straddles the boundary between the upland and lowland parts of the Tyne basin and is located where the South Tyne River emerges from the confines of the Northern Pennine Hills. The Lambley reach is 2.75 km long and can be subdivided into two sub-reaches, each of approximately equal length, north and south of the Coanwood–Lambley road bridge (Figure 5.25). The channel in the southerly sub-reach is currently stable, after experiencing aggradation and braiding between 1860 and 1920, followed by incision until the 1970s (Figure 5.26) (Passmore *et al.,* 1993; Macklin *et al.,* in press). Conversely, downstream, and north of the bridge, low rates of lateral channel shift were evident between 1860 and 1952, although since the 1950s the river has become both laterally and vertically active with increasing channel division around elongate medial bars, high rates of bank erosion (> 5 m $yr^{1}$) and aggradation in the lower part of the reach (Figure 5.27). As a result of high rates of contemporary bank erosion and recent channel incision, a sequence of Late Pleistocene, Holocene and historical age river terraces are particularly well-exposed along the reach.

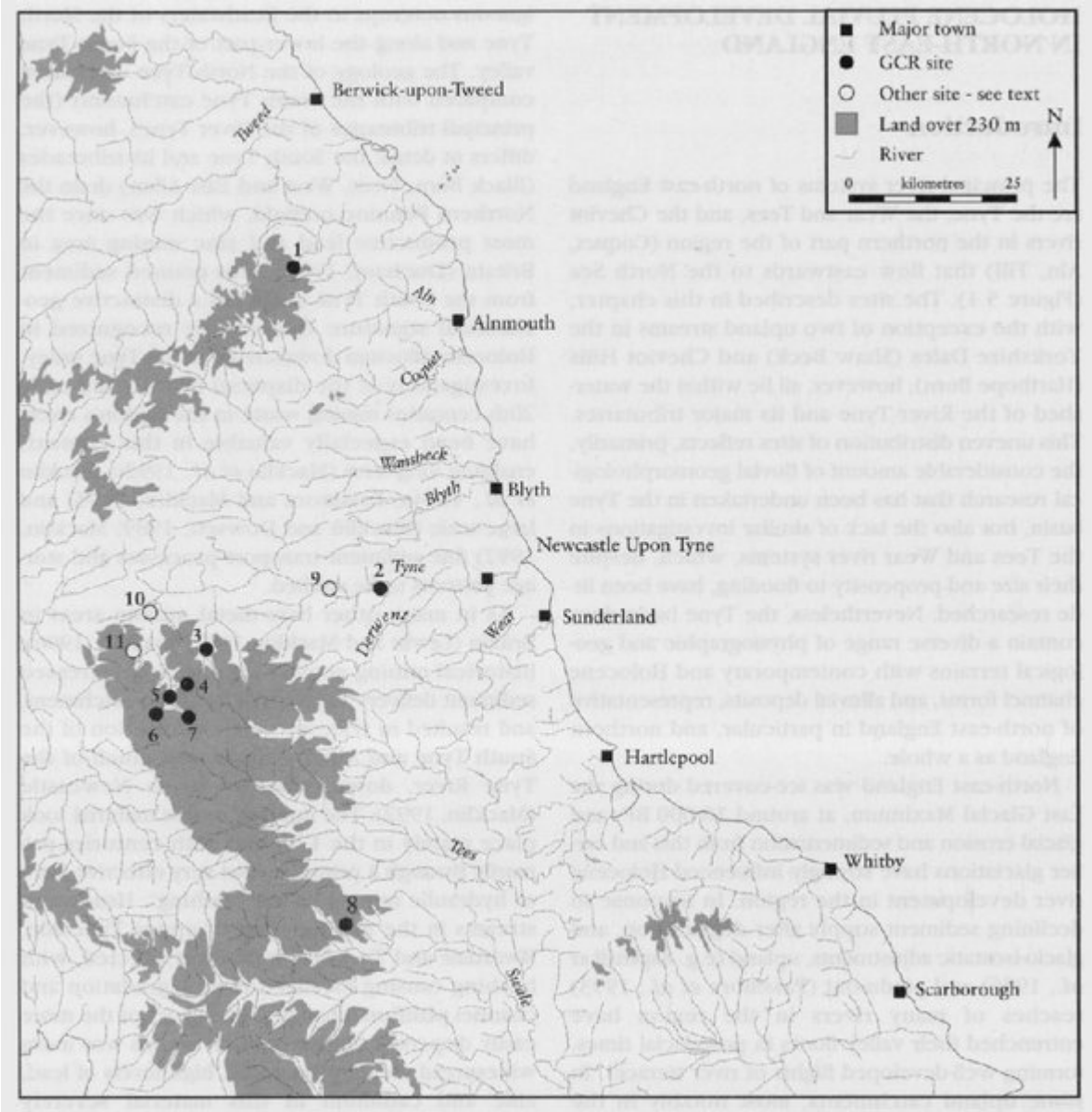
Investigations of both long- and short-term river dynamics have been undertaken at Lambley centred around three main research topics:

1. Holocene river development, particularly the effect of climate-related changes in flood magnitude, and late prehistoric and historical farming on valley floor alluviation and erosion (Passmore *et al.,* 1993; Passmore 1994).
2. River channel metamorphosis resulting from historical lead and zinc mining (Macklin and Lewin, 1989) and the impact of metal pollutants from mining waste on riparian vegetation (Macklin and Smith, 1990).
3. Present-day sediment transport processes and fluxes investigated through repeat levelling of monumented cross-sections, sediment tracing experiments and mapping of bars and river-bed structures (Sohag, 1994). This latter research is on going and there is considerable scope for future studies, particularly sediment budgeting (Macklin *et al.,* in press).

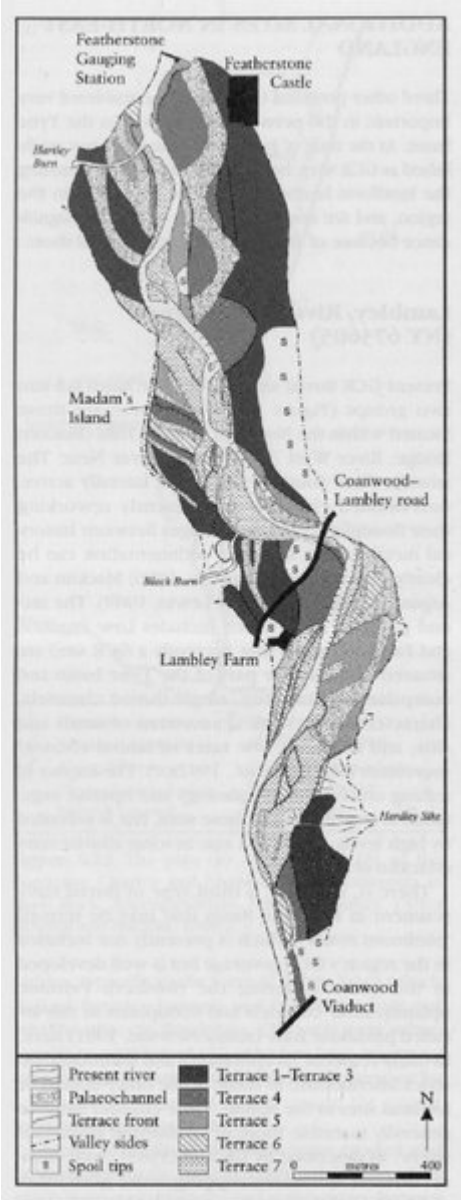
Lambley meets GCR selection criteria on two accounts: firstly, the range of research themes that have been explored, and, secondly, the opportunity to set present-day river channel processes in a longer-term context through stratigraphic

and sedimentological investigation of Holocene alluvial landforms and deposits.

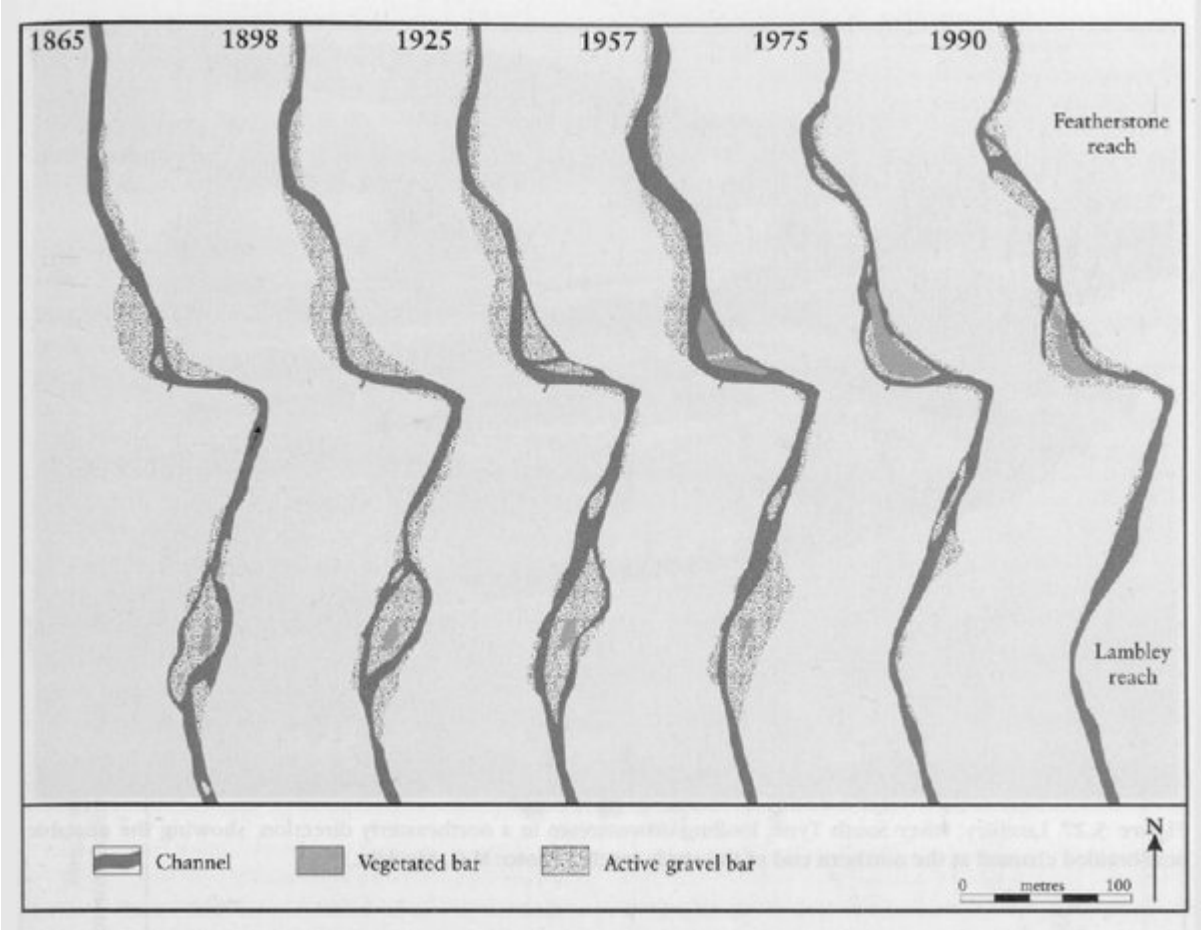
## References




*(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 5.25) Pleistocene and Holocene river terraces and palaeochannel sequences at Lambley, River South Tyne, Northumberland. (After Passmore, 1994.)*




*(Figure 5.26) Successive maps of channel and bar morphology at Lambley and Featherstone, River South Tyne, derived from cartographic, aerial photograph and field mapping (1990) sources. (After Passmore et al., 1993).*

*(Figure 5.27) Lambley, River South Tyne, looking downstream in a northeasterly direction, showing the unstable near-braided channel at the northern end of the study reach. (Photo: M.G. Macklin.)*