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Human impacts and sediment connectivity in the hillslope/alluvial geomorphic system.

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Hillslope and alluvial depositional environments reflect the combined affects of landscape utilisation, climate, storm (flood) and autogenic conditioning/forcing. Discerning the impacts of human activity on the geomorphic system requires well constrained archaeological and palaeoecological histories. To understand the geomorphic record requires consideration of variation in (dis)-connectivity relationships in sediment transfer between different parts of the system e.g. hillslope to axial stream. This paper utilises the radiocarbon-dated Holocene geomorphic succession developed for the Bowland Fells and river Hodder catchment in northwest England, alongside new palaeoecological data and a re-evaluation of the (geo)archaeological heritage. The palaeoecological and archaeological data show a late Holocene expansion in human utilisation of the landscape from the Iron Age (3000-2000 BP) onwards, with changes the character and increases in the intensity of upland landuse during the last 1200 years. The geomorphic response on the hillslopes was the onset of considerable hillslope erosion (gullying) with associated alluvial fan development. Interpretation of the regional radiocarbon chronology available from organic matter buried beneath alluvial fan units suggests much of this geomorphic activity can be attributed to four phases of more extensive gullying identified after 2500–2200, 1300–1000, 1000–800 and 500 cal. BP. There is clear evidence for strong within-system coupling, with the downstream alluvial system responding to these pulses of increased sediment supply. These alluvial reaches experienced considerable valley floor deposition and lateral channel migration, producing several alluvial terraces that have also been secured by 14C dating. Changes between states of aggradation and incision in alluvial reaches highlight the increased connectivity between hillslope and the alluvial system. In essence this

paper explores forcing of the geomorphic system looking at how the impact of external forcing factors, and human impacts, are moderated and propagated through a connected/coupled land-system.