
Strathglass Meanders, Highland

[NH 385 360]

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Highlights

The meanders associated with the River Glass, west of Inverness, provide a noteworthy example of an irregularly meandering channel within a wide valley floor in a Scottish upland environment.

Introduction

The River Glass, a tributary of the River Beaully, flows SW to NE, draining a large upland catchment of 482 km² (e.g. the summit of Cam Gorm, 676 m). In terms of its glacial legacy, the valley of the River Glass is believed to have been a former lake bed that occupied the valley before the cutting of the downstream Aigas Gorge. This explains the origin of the fine sediments that the present River Glass is actively reworking (Horne and Hinxman, 1914).

Description

The low-flow channel planform varies from sinuous to irregularly meandering (Kellerhals *et al.*, 1976), with sand-sized material in the banks (Figure 2.13). The selected reach of the meandering channel utilizes a large proportion of the floodplain of the River Glass (typically 700 m wide) and extends downstream over 5 km. Stretches of the channel are tree-lined and these appear to be more stable reaches. Tributaries take the form of steep mountain torrents, frequently deeply incised into gullies, which debouch into the main valley where they have built coarse-grained alluvial fans (e.g. the Glass Burn and Allt a' Chrais). The distal margins of these fans are being reworked by the present River Glass.

The irregularly meandering channel planform also possesses unusual slackwater areas (e.g. Loch Gaillte or Loch an Deala), immediately upstream of several meander bends. There are a large number of palaeomeander features evident on the flood-plain, e.g. Loch an Eilein.

The River Glass has been gauged at Kerrow Wood (within the SSSI) since 1988 and up to 1992 recorded a mean flow of c. 40 m³s⁻¹. The maximum instantaneous flow during the flood on 15 January 1989, which affected much of northern Scotland, was 314 m³s⁻¹. It should be noted that the Loch Beinn a' Mheadhoin hydroelectric power scheme in Glen Affric and the Loch Mullardoch scheme in Glen Cannich, implemented in the 1940s, will enforce an artificial runoff regime on the River Glass. Historic floods are also documented on the 24–26 January 1849 and 24 January 1892 in Nairne (1895) with Strathglass being severely inundated. The damage at Wester Chrochail during the latter flood was extensive, with large quantities of gravel deposited on the floodplain. Four feet of flood water (1.2 m) were also recorded at Easter Chrochail on the edge of the floodplain.

Interpretation

The irregular planform is interesting due to the temporal and spatial persistence of the meandering system. The irregular meander bends possibly relate to a lack of homogeneity in the floodplain sediments and the location of tributary inputs with associated changes in base-level slopes. The slack-water areas are clearly related to longer-term channel adjustment and since they appear on the 1876 map, comprise one of the more permanent features of floodplain topography. One explanation is that these features represent zones of incipient channel subdivision at higher flows, i.e. channel planform is highly stage dependent with localized anabranching during major floods. These slackwater areas clearly pre-date any damming on the River Glass.

The palaeomeanders proximal to the current channel indicate that the river has clearly been more active at some indeterminate time in the past. Some reaches, such as the active divided area near Glassburn, have undergone change since 1876 (as indicated on the first and second edition 1:10 560 OS maps of 1876 and 1901; (Figure 2.14)) and continue to be active at the present time. Local instability at these sites may be related to the location of tributary confluences with their high contributing discharges during extreme flows (leading to locally enhanced competence) and also local inputs of coarser sediment.

Further research is required on the spatial variation in rates of channel adjustment over time and on the relationship between the channel and its river corridor. Some of the slackwater areas indicated in 1876, for example near Incaulby, are merely depicted as palaeochannels by 1901, implying progressive infilling of abandoned channels with flood sediments. The cutoff meander of Loch an Eilein has also infilled with sediment and rushes over the same period. The nature and rate of main of these palaeofeatures has yet to be investigated.

This site is also worthy of long-term monitoring because upstream damming, which now enforces an artificial runoff regime, will have altered the magnitude and frequency of extreme flows. The impact of these changes in flow regime on downstream rates of planform adjustment would be especially interesting to investigate.

Conclusion

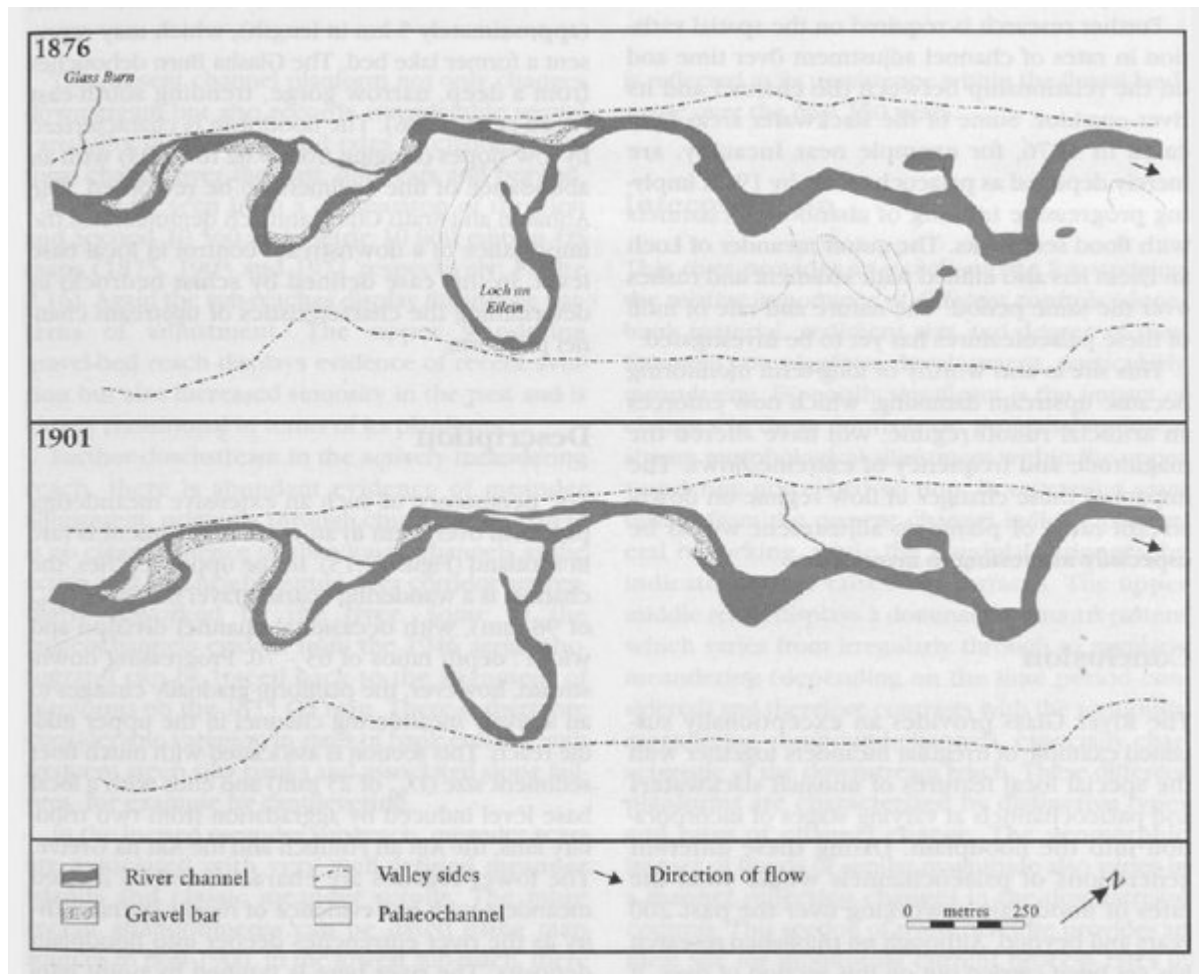
The River Glass provides an exceptionally sustained example of irregular meanders together with the special local features of unusual slackwaters and palaeochannels at varying stages of incorporation into the floodplain. Dating these different generations of palaeochannels would yield the rates of floodplain reworking over the past 200 years and beyond. Although no published research has yet been carried out on this section of river, it is recognized as providing an excellent site for the study of irregular meander development in a Scottish upland environment.

[References](#)



(Figure 2.13) Irregular meanders developed on the River Glass. The channel is characterized by a sequence of irregular meanders and associated slackwater areas plus numerous palaeochannels of contrasting ages embedded within the

floodplain. (Photo: Royal Commission on the Ancient and Historical Monuments of Scotland; print 4188, 61489; flown May 1989: Crown Copyright.)



(Figure 2.14) The River Glass in Strathglass: a comparison of the planforms in 1876 and 1901. Channel stability increases in the downstream direction. A number of abandoned channels and infilled palaeochannels occupy the floodplain. (Source: First and Second Edition 1 : 10 560 scale Ordnance Survey maps.)