SECTION 2: THE CATCHMENTS OF THE TWEED AND THE EYE

2.1 : Topography and Geology

> *"Tweed" is a politically composite but scientifically natural area …. Surrounded on three sides by hills of considerable height, it takes the form of a vast amphitheatre, facing the German Ocean.*
>
> (Evans, A. H., 1911: *A Fauna of the Tweed Area)*

(A) Geology and Landscape : The catchments of the Tweed and the Eye lie in the Southern Uplands, an area of higher ground raised up from the Central Lowlands of Scotland by the Southern Upland Fault, which runs from near Dunbar south-west to Girvan in Ayrshire (Map 2.1.1) and is made up of sedimentary rocks of between 400 and 450 million years in age. In very broad terms, the catchment to the north and west of a line from Dunbar to Hawick is made up of hard Greywackes (a coarse metamorphic rock) whilst softer Old Red Sandstones and Carboniferous Limestones predominate to the south and east. Volcanic plugs form characteristic outstanding hills such as Ruberslaw, Minto, the Eildons and St. Abb's Head while the Cheviots are volcanic lavas. This geological pattern underlies and forms the visible landscape - to the west, the harder rocks form a "dissected plateau" (a level area cut with river valleys) succeeded by low rolling hills to the eastward, falling away to the flat lands of the Merse on the softer rocks. To the north, high sea cliffs around St. Abb's mark where harder rocks reach the sea in contrast to the long, smooth, sandy coastline south of Berwick formed where the softer rocks do so. The geology is summarised in Table 2.1.1. The present landscape bears the imprint of the last glaciation which was at its maximum 18,000 years ago when much of the area was under 2,000 m of ice. The peak of the local ice dome was over Moffat and the Tweedsmuir Hills, and the flow was largely eastwards, eroding large amounts of bedrock which was deposited on the lowlands to the south and east and then moulded by melting ice and meltwaters. St. Mary's Loch now occupies a basin scoured out by the ice and it was the ice that broke through to create the Biggar Gap, an area so flat that it allows links between the Tweed and Clyde catchments and today there are three wetland areas that drain on their west into the Clyde and on their east into the Tweed (Gillen, 1995). It has been reported that Salmon that enter the Coulter Burn from the Biggar Water can at high water levels end up crossing into the Clyde and spawning, producing Salmon Parr far upstream of the Falls of Clyde that are a complete block to Clyde fish (Calderwood,1909).

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A charitable trust established by the River Tweed Commission to promote the development of fish stocks in the Tweed River System

Table 2.1.1 The hard geology of the Tweed catchment

Bedrock	Area (km^2)
Agglomerate in neck	11.43
Andesitic and basaltic lavas and tuffs, undifferentiated	566.50
Ashgill and Caradoc (includes small inliers of Arenig-Llandeilo in Scotland)	448.37
Basal Conglomerate (including possible Devonian)	19.38
Basalt and spilite	87.99
Basalt dolerite, camptonite and allied types	50.73
Granite, syenite, granophyre and allied types	67.69
Llandovery	2242.20
Lower Old Red Sandstone, including Downtonian	274.19
Namurian (Millstone Grit Series)	15.92
Open Water	7.94
Porphyrite, lamprophyre and allied types	22.36
Rhyolite, trachyte and allied types	15.47
Rhyolite, trachyte, felsite, elvans and allied types	36.25
Tournaisian and Visean (Carboniferous Limestone Series)	957.50
Tuff	5.18
Tuff and agglomerate, undifferentiated, mainly basaltic	2.90
Upper Old Red Sandstone	586.02
Wenlock	180.01

Around 10,000 years ago, the ice melted in just a few hundred years to reveal the landform and drainage pattern as it is today, though after a period in which natural reservoirs behind ice dams and deposits would have made areas now inaccessible above waterfalls reachable by the trout that were then colonising the area. The superficial deposits are tabulated in Table 2.1.2

Table 2.1.2: The surface deposits within the Tweed catchment

Superficial deposits	Area (km^2)
Alluvium	304.31
Uncategorised Drift deposits	7.97
Glacial sand and gravel	230.37
Peat	279.01
River Terraced deposits (undifferentiated)	33.87
TILL	2574.74
Open Water	7.94

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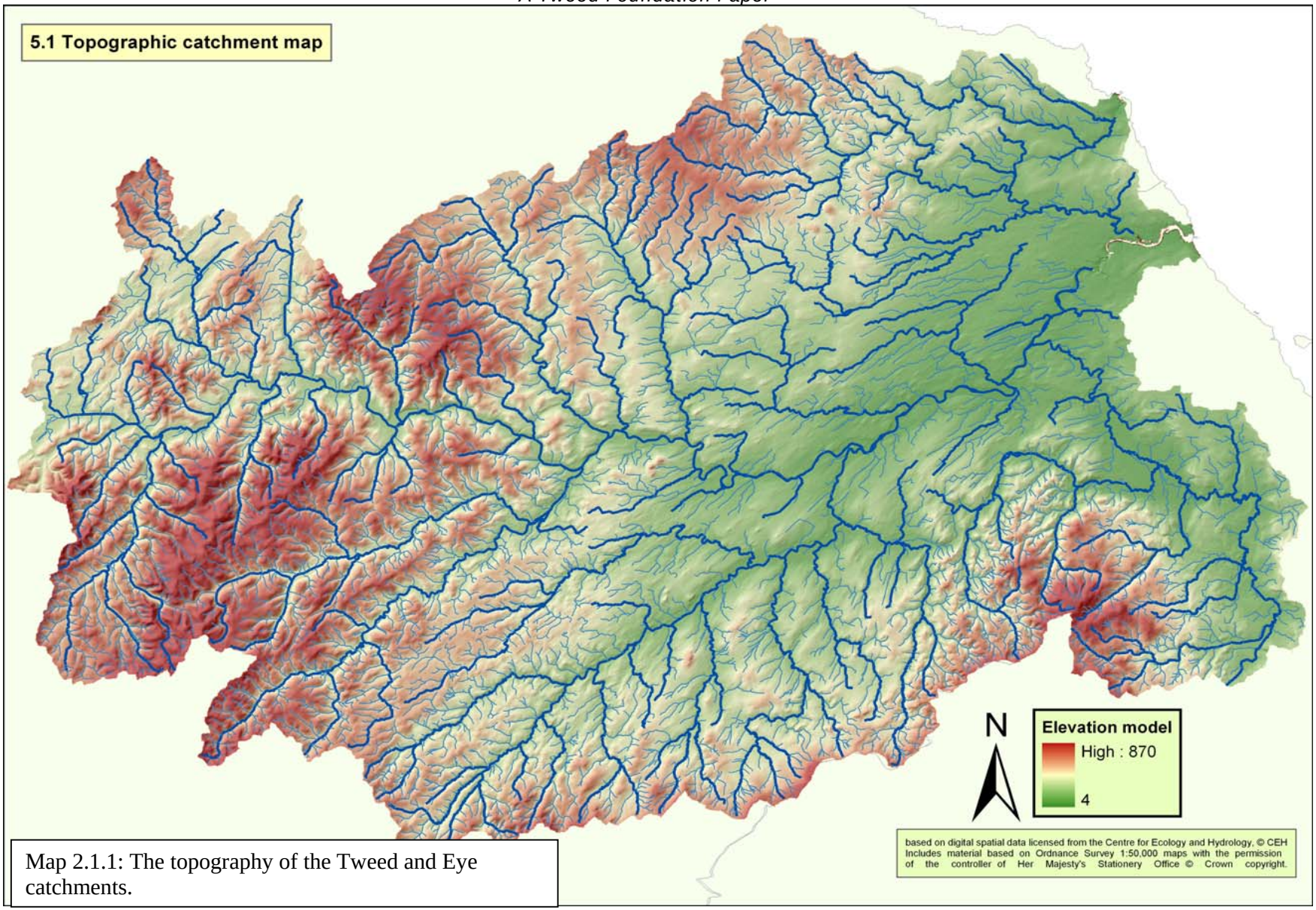

Map 2.1.1: The topography of the Tweed and Eye catchments.