

TECHNICAL NOTE

JBA Project Code	2018s0951
Contract	Smithies Restoration FRA
Client	Yorkshire Wildlife Trust
Day, Date and Time	28/05/2018
Author	Katie Burnham
Reviewer / Sign-off	David Mould

1 Background

1.1 Scope

Flow percentiles for the River Dearne are required as part of the river restoration design works at the Smithies site north of Barnsley, Figure 1-1. In order to derive a suitable flow duration curve (FDC) available gauged river data downstream (0.7km) of the site at Barnsley Weir has been used. The catchment area at the gauge is 118.9km²; this is greater than the catchment area at the site which is calculated at 115.4km².

1.2 Data available

Gauge data at the site was supplied by the Environment Agency (under the freedom of information act) for use as part of the following assessment:

- 27023 – Dearne at Barnsley Weir

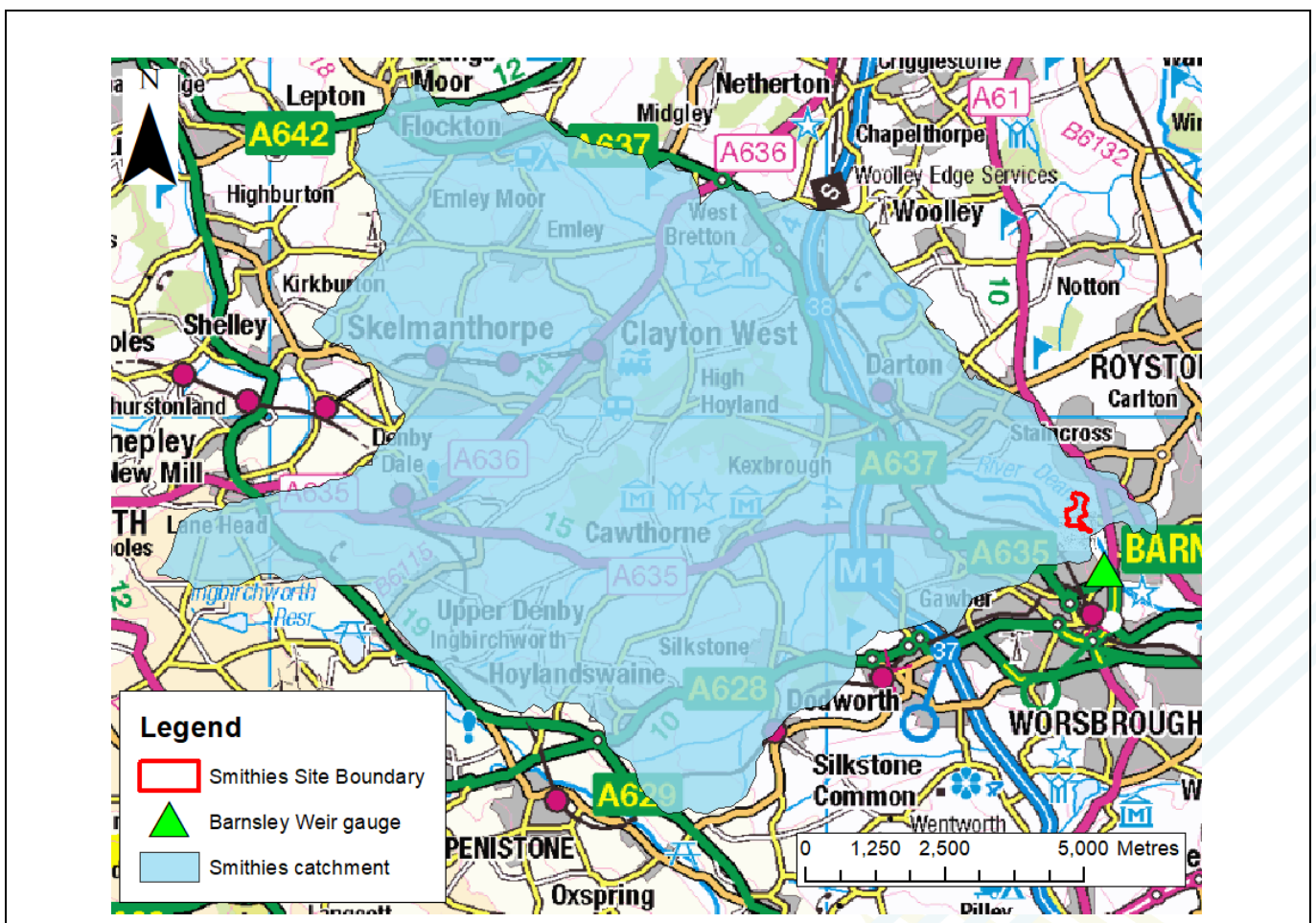


Figure 1-1 Lune Bridge catchment and gauge location

TECHNICAL NOTE

JBA Project Code	2018s0951
Contract	Smithies Restoration FRA
Client	Yorkshire Wildlife Trust
Day, Date and Time	28/05/2018
Author	Katie Burnham
Reviewer / Sign-off	David Mould

2 Flow regime at Lune Bridge

2.1 Quality Analysis

Table 2-1 provides the record length, mean flow and catchment area for the Barnsley Weir gauge. Over 50 years of available data was provided for the gauge, this is considered a good length of record. The quality of the of record, is summarised in Table 2-2. Overall the proportion of record considered to be good is reasonably high >65%, however, a large majority (30%) of the dataset remains unchecked. For the purpose of this analysis this is considered acceptable.

Information freely available on the National River Flow Archive indicates that the site is slightly influenced by abstractions and runoff within the catchment. Reasonable conformity is shown between the gauge derived FDC and the FDC derived from LowFlow2 software (developed by CEH), Figure 2-1. This software estimates the natural flow regime at the location based on a database of hydrologically similar catchments.

Table 2-1 Statistics of the flow gauge at Barnsley Weir - 27023		
Record provided	Mean Flow (m ³ /s)	Catchment area (km ²)
03/02/1965 – 06/06/2019	1.34	118.9

*mean flow and catchment area available from the National River Flow Archive (site visited 28/05/2019)

Table 2-2 Quality check of flow gauge at Barnsley Weir				
Good (%)	Estimated (%)	Suspect (%)	Unchecked (%)	Missing (%)
68	0	0	30	1

2.2 Flow Duration Curve

Using the supplied mean daily flow data, an FDC was derived for the gauge site. The gauged FDC was scaled to the catchment area of the site to provide a more accurate estimate at Smithies, Figure 2-1.

Key design exceedances are provided in Table 2-3.

TECHNICAL NOTE

JBA Project Code
Contract
Client
Day, Date and Time
Author
Reviewer / Sign-off

2018s0951
Smithies Restoration FRA
Yorkshire Wildlife Trust
28/05/2018
Katie Burnham
David Mould

JBA
consulting

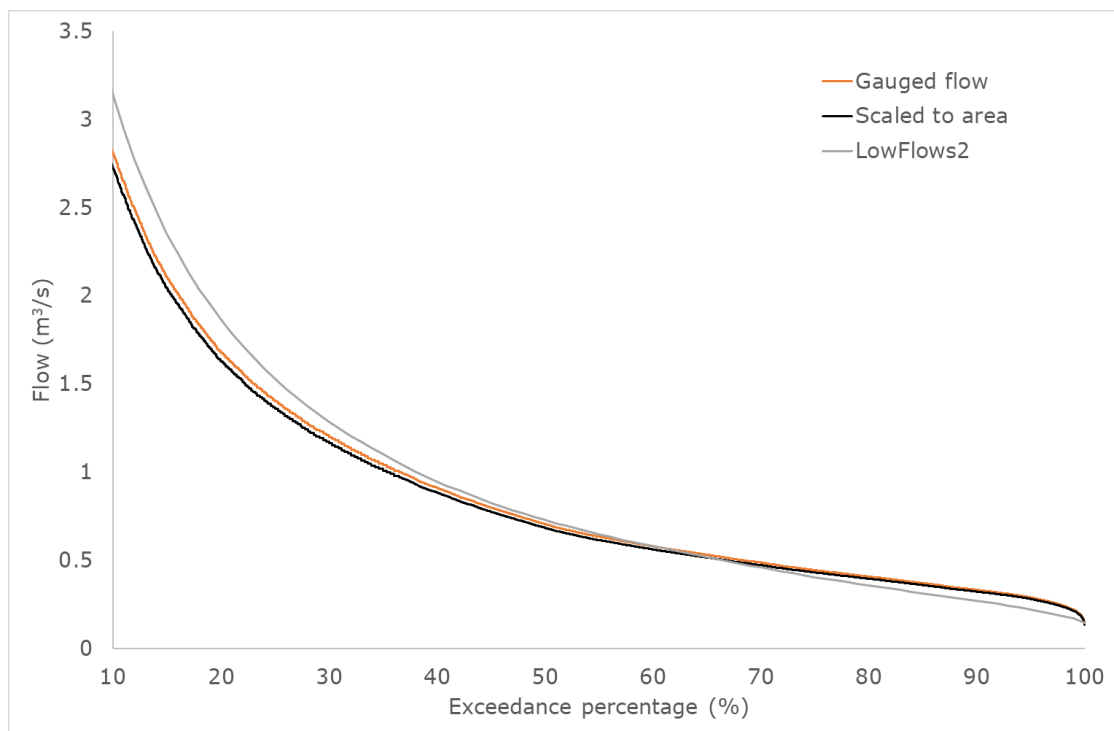


Figure 2-1 Gauge derived FDC (Q10 – Q100 only)

Table 2-3 Key exceedance flow values	
Exceedance	Flow (m³/s)
Qmean*	1.30
Q95	0.29
Q70	0.47
Q50	0.69
Q10	2.73

* scaled to data available from the National River Flow Archive (site visited 28/05/2019)