Brinsworth Academy

GEOGRAPHY DEPARTMENT

Paper 1: UK Landscapes – Rivers
Paper 3: Physical fieldwork - Rivers

GCSE Data Collection Booklet

NAME:

CLASS:

People in your group:

Specification Check:

Investigating river processes and pressures

Investigating how and why drainage basin and channel characteristics influence flood risk for people and property along a river in the UK.

Fieldwork and research	General focus of fieldwork
1. Formulating enquiry questions	Students must have an opportunity to develop understanding of the kinds of questions capable of being investigated through fieldwork in river environments. Students must have an opportunity to develop a question(s) based on their location and the task.
2. Selecting fieldwork methods	Fieldwork data collection must include at least: • one quantitative fieldwork method to measure changes in river channel characteristics • one qualitative fieldwork method to collect data on factors that might influence flood risk.
3. Secondary data sources	• A flood risk map e.g. Environmental Agency Flood Risk map • One other source chosen by the centre.

Our enquiry questions:

How and why do drainage basin and channel characteristics change as you go downstream along Burbage Brook?

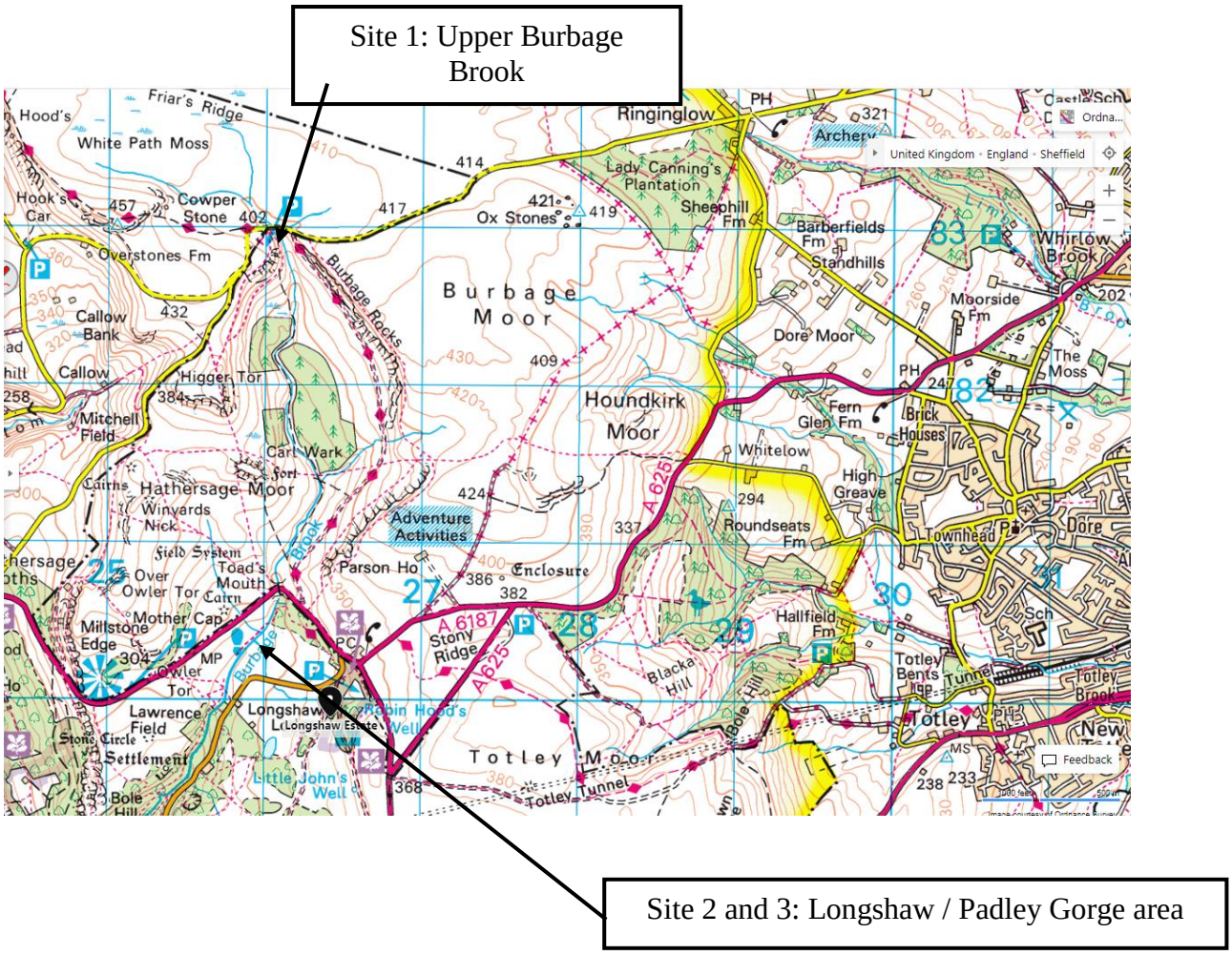
Extension - How does flood risk change as you go downstream?

The Day at Burbage Brook

In groups you will visit different sites along Burbage Brook and complete a range of **primary data collection methods**. The **data collection methods** will allow you to gather data to answer the enquiry question above and follow the ***route of enquiry***. The methods you will carry out are in the table below:

Primary Data Collection – at the River Chess	
Quantitative Data Collection	**Qualitatative Data Collection**
1. Bedload sample 2. Channel characteristics (width, depth, velocity) 3. Velocity	1. Flood impact assessment 2. Field sketches
Secondary Data Collection – in school	
1. British Geological Survey Map 2. Environment Agency Flood Risk Map	

Where will you carry out your data collection along Burbage Brook?



Data Collection Method	What did this method involve?	Primary or secondary?	Quantitative or Qualitative?	Method of sampling used	Reliable or not? Why?
Bed load Sampling (size and roundness)					
Channel Characteristics (width, depth, wetted perimeter)					
Flow rate (float distance / time)					
Field Sketches					
Flood Impact Assessment					
Other notes:					

Risk Assessment for site 1

	Likelihood				
Consequence	**Rare**	**Unlikely**	**Possible**	**Likely**	**Almost Certain**
Insignificant	Negligible	Negligible	Low	Low	Tolerable
Minor	Negligible	Low	Tolerable	Tolerable	Tolerable
Moderate	Low	Tolerable	Tolerable	High	Extreme
Major	Tolerable	Tolerable	Extreme	Extreme	Extreme
Catastrophe	High	High	Extreme	Extreme	Extreme

Risks	Description of risk	How to control/reduce risk	Assessing risk through the matrix		
			Likelihood	Consequence	Rating
1.					
2.					
3.					
4.					

Risk Assessment for site 2 and 3

	Likelihood				
Consequence	**Rare**	**Unlikely**	**Possible**	**Likely**	**Almost Certain**
Insignificant	Negligible	Negligible	Low	Low	Tolerable
Minor	Negligible	Low	Tolerable	Tolerable	Tolerable
Moderate	Low	Tolerable	Tolerable	High	Extreme
Major	Tolerable	Tolerable	Extreme	Extreme	Extreme
Catastrophe	High	High	Extreme	Extreme	Extreme

Risks	Description of risk	How to control/reduce risk	Assessing risk through the matrix		
			Likelihood	Consequence	Rating
1.					
2.					
3.					
4.					

Site 1 – Width and channel depth

Width:……..

Channel Depth This table is for you to record the depth. If you are looking downstream, you should start from the left.

Width (m)	Depth (cm)	Width (m)	Depth (cm)
0		3.30	
0.30		3.60	
0.60		3.90	
0.90		4.20	
1.20		4.50	
1.50		4.80	
1.80		5.10	
2.10		5.40	
2.40		5.70	
2.70			
3.00			

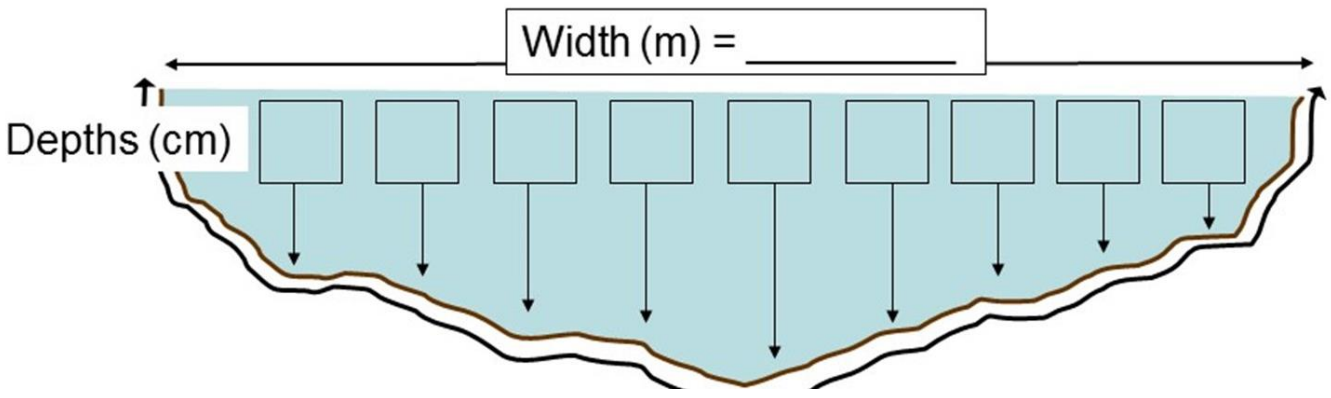
This calculation is to work out the cross sections area.

Average depth: calculate by adding up all your depth measurements and dividing by the number of readings =_____m

Cross sectional area (width x average depth)

_____x_____=_____metre squared

This is what the depth, width and cross section looks like in a diagram.



Site 1 - Velocity

1. You should measure the velocity in the left side, middle and right side of the stream. You should complete three at each side. The left is the left as you look downstream. You have 2 floats only, try not to lose them.

Length of reach (how far the float is travelling) _____ metres

Time of floats (seconds)

Attempt	Left side	Middle	Right Side	
1st				
2nd				
3rd				
Average time				Overall average
Velocity				Overall velocity

2.You can now calculate velocity in each position (left, centre, right) and an average using this formula.

$$\text{Velocity} = \frac{\text{distance (m)}}{\text{Time taken (sec)}}$$

Velocity = _____= m/sec

3. You can now calculate river discharge

Discharge (amount of water flowing down the river) = cross section area x velocity

_____x_____

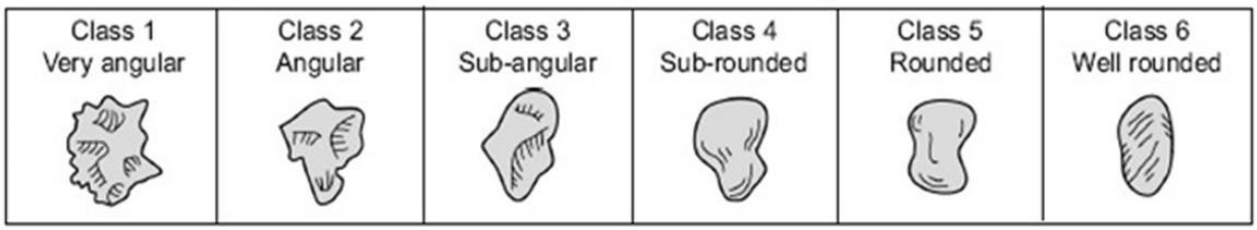
=_____cumecs

Site 1 – Bedload and fieldsketch

Bedload sample

Bedload Sample	1	2	3	4	5	6	7	8	9
Bedload Size									
Bedload Roundness									

Power's index of roundness



Draw a fieldsketch with 5 labels of features and or processes that you can see.

Site 1 – Gradient of river and valley sides.
You should use a clinometer over a 5 metre distance.

The gradient of the river was …….

Standing in (or alongside the river) and looking upwards of the river.
The left valley / bank side …….

The right valley / bank side …….

Site 2 – Width and channel depth

Width:…….

Channel Depth This table is for you to record the depth. If you are looking downstream, you should start from the left.

Width (m)	Depth (cm)	Width (m)	Depth (cm)
0		3.30	
0.30		3.60	
0.60		3.90	
0.90		4.20	
1.20		4.50	
1.50		4.80	
1.80		5.10	
2.10		5.40	
2.40		5.70	
2.70			
3.00			

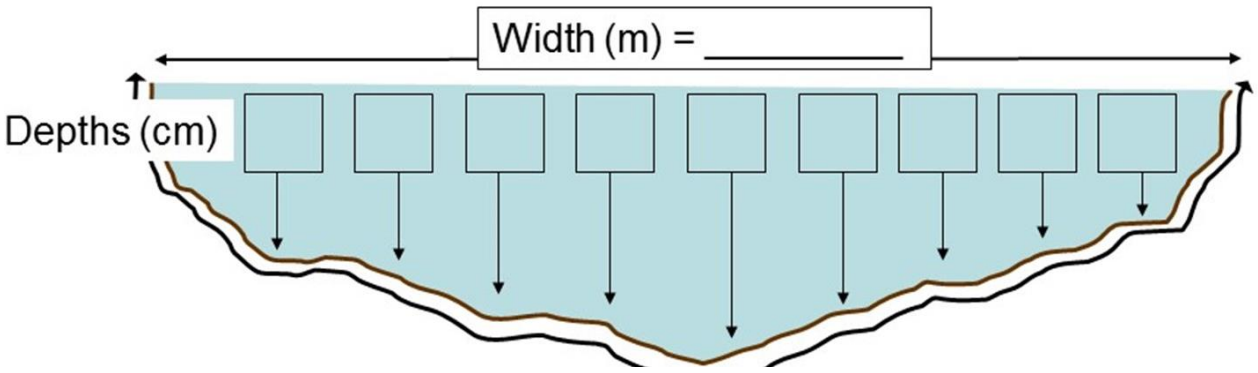
This calculation is to work out the cross sections area.

Average depth: calculate by adding up all your depth measurements and dividing by the number of readings =_____m

Cross sectional area (width x average depth)

_____x_____=_____metre squared

This is what the depth, width and cross section looks like in a diagram.



Site 2 - Velocity

1. You should measure the velocity in the left side, middle and right side of the stream. You should complete three at each side. The left is the left as you look downstream. You have 2 floats only, try not to lose them.

Length of reach (how far the float is travelling) _____ metres

Time of floats (seconds)

Attempt	Left side	Middle	Right Side	
1st				
2nd				
3rd				
Average time				Overall average
Velocity				Overall velocity

2.You can now calculate velocity in each position (left, centre, right) and an average using this formula.

$$\text{Velocity} = \frac{\text{distance (m)}}{\text{Time taken (sec)}}$$

Velocity = _____= m/sec

3. You can now calculate river discharge

Discharge (amount of water flowing down the river) = cross section area x velocity

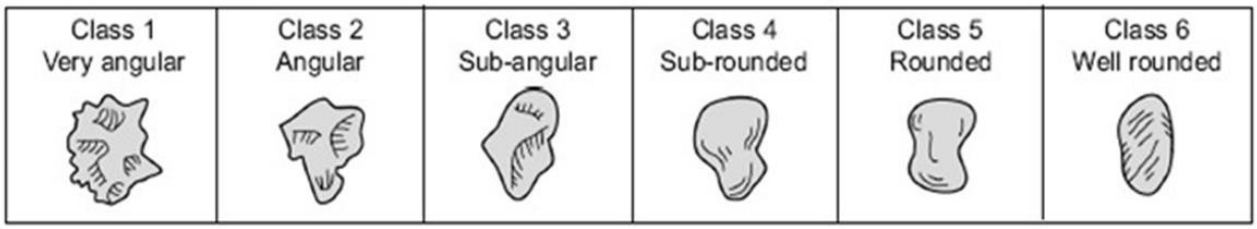
_____x_____

=_____cumecs

Site 2 - Bedload sample and fieldsketch

Bedload Sample	1	2	3	4	5	6	7	8	9
Bedload Size									
Bedload Roundness									

Power's index of roundness



Draw a fieldsketch with 5 labels of features and or processes that you can see.

Site 2 – Gradient of river and valley sides.
You should use a clinometer over a 5 metre distance.

The gradient of the river was …….

Standing in (or alongside the river) and looking upwards of the river.
The left valley / bank side …….

The right valley / bank side …….

Site 3 – Width and channel depth

Width:…….

Channel Depth This table is for you to record the depth. If you are looking downstream, you should start from the left.

Width (m)	Depth (cm)	Width (m)	Depth (cm)
0		3.30	
0.30		3.60	
0.60		3.90	
0.90		4.20	
1.20		4.50	
1.50		4.80	
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3.00			

This calculation is to work out the cross sections area.

Average depth: calculate by adding up all your depth measurements and dividing by the number of readings =_____m

Cross sectional area (width x average depth)

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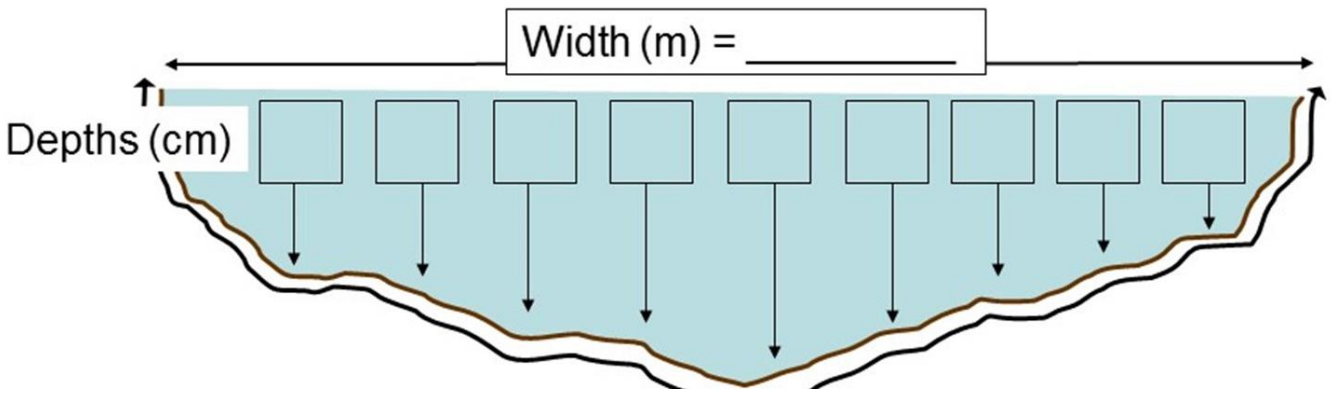


Site 3 - Velocity

1. You should measure the velocity in the left side, middle and right side of the stream. You should complete three at each side. The left is the left as you look downstream. You have 2 floats only, try not to lose them.

Length of reach (how far the float is travelling) _____ metres

Time of floats (seconds)

Attempt	Left side	Middle	Right Side	
1st				
2nd				
3rd				
Average time				Overall average
Velocity				Overall velocity

2.You can now calculate velocity in each position (left, centre, right) and an average using this formula.

$$\text{Velocity} = \frac{\text{distance (m)}}{\text{Time taken (sec)}}$$

Velocity = _____= m/sec

3. You can now calculate river discharge

Discharge (amount of water flowing down the river) = cross section area x velocity

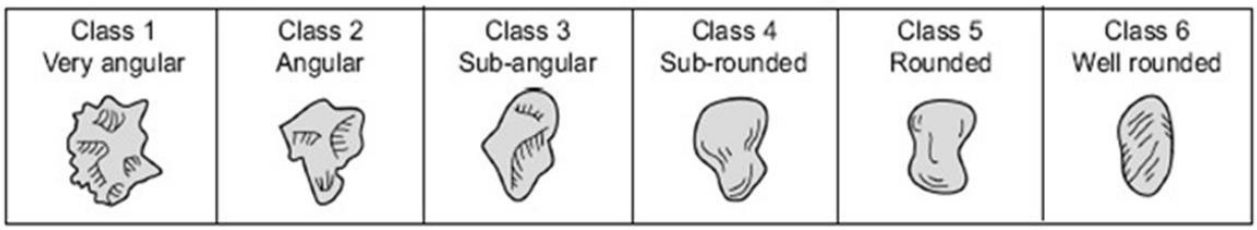
_____x_____

=_____cumecs

Site 3 - Bedload sample and fieldsketch

Bedload Sample	1	2	3	4	5	6	7	8	9
Bedload Size									
Bedload Roundness									

Power's index of roundness



Draw a fieldsketch with 5 labels of features and or processes that you can see.

Site 3 – Gradient of river and valley sides.
You should use a clinometer over a 5 metre distance.

The gradient of the river was ……

Standing in (or alongside the river) and looking upwards of the river.
The left valley / bank side ……

The right valley / bank side …….

Extension tasks - Site 1 flood assessment

Social impact		Economic impact		environmental impact	
0	Nobody effectively services affected	0	No impact to businesses	0	Low environmental important habitats affected e.g. car parks wasteland
1	few people affected minimal destruction to community life	1	Minimal impact Few employees affected	1	Some buildings affected Low environmental important habitats impacted Minimal pollution
2	Some people affected some non-vital services affected e.g. shops offices	2	Some businesses are damaged closed Some employees affected Median value activity e.g. small retail affected	2	Normal put buildings affected median important habitats impacted e.g. gardens parkland farm land Increase in pollution
3	Many vital services affected e.g. hospitals health clinics Vulnerable people EG children elderly affected Large disruption to community life	3	High-value economic activity affected EG large retail Large number of employees affected Businesses shut down	3	Historic buildings affected High important habitats impacted e.g. conservation areas nature reserves Toxic or hazardous pollution
use the flood impact assessment table and give us a score from 0 to 3 and add up to get the ***total flood impact score***					

Site 2 and 3 flood assessment

Social impact		Economic impact		environmental impact	
0	Nobody effectively services affected	0	No impact to businesses	0	Low environmental important habitats affected e.g. car parks wasteland
1	few people affected minimal destruction to community life	1	Minimal impact Few employees affected	1	Some buildings affected Low environmental important habitats impacted Minimal pollution
2	Some people affected some non-vital services affected e.g. shops offices	2	Some businesses are damaged closed Some employees affected Median value activity e.g. small retail affected	2	Normal put buildings affected median important habitats impacted e.g. gardens parkland farm land Increase in pollution
3	Many vital services affected e.g. hospitals health clinics Vulnerable people EG children elderly affected Large disruption to community life	3	High-value economic activity affected EG large retail Large number of employees affected Businesses shut down	3	Historic buildings affected High important habitats impacted e.g. conservation areas nature reserves Toxic or hazardous pollution
use the flood impact assessment table and give us a score from 0 to 3 and add up to get the ***total flood impact score***					

Overall flood rating

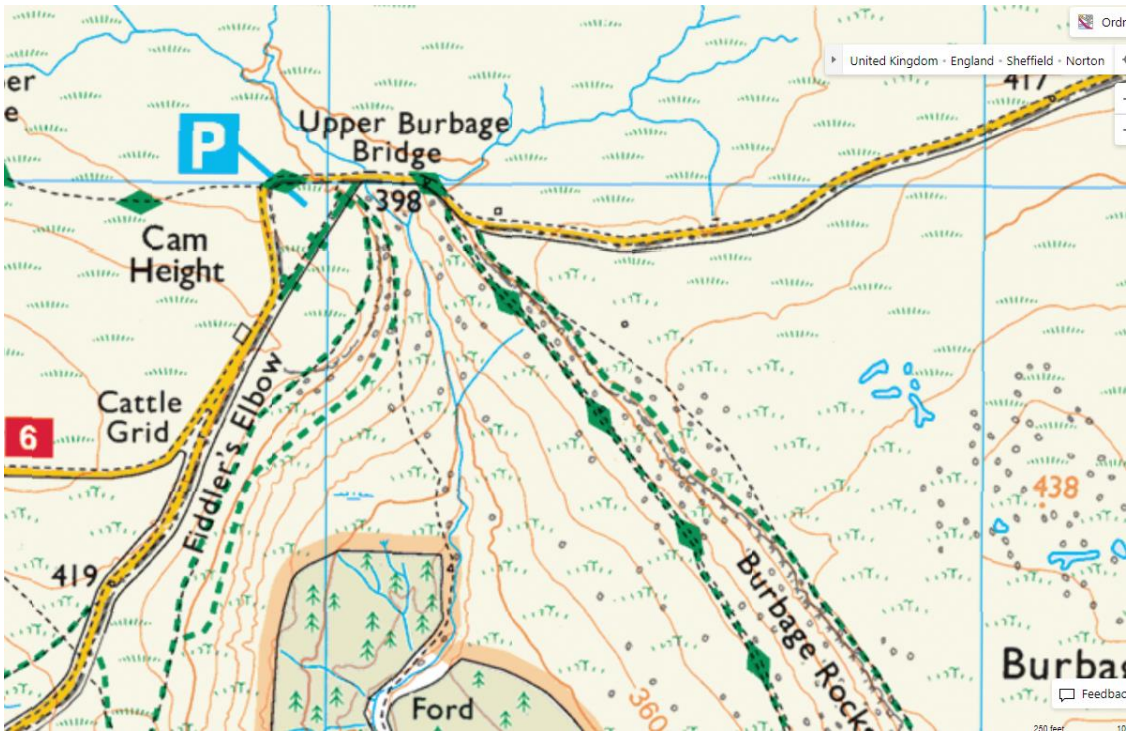
	Social impact score	Economic impact score	Environmental impact score	Total flood impact score	Evidence of Human interference and channel management?
Site 1 _____					
Site 2 _____					
Site 3 _____					

Examples of human interference and channels management

- Evidence of bank erosion
- Channels artificially widened
- Channel artificially straightened either partially or completely
- Evidence of bank support or repair e.g. sandbags
- Artificial banks ie large sections of the river lined by concrete banks and all brick walls
- Soft engineering AG log deflectors brash barriers

OS maps of the sites

Site 1



Site 2 and 3