Institute of Freshwater Ecology

Rivers Ouse, Wharfe and Ure Macrophyte Surveys (1998)

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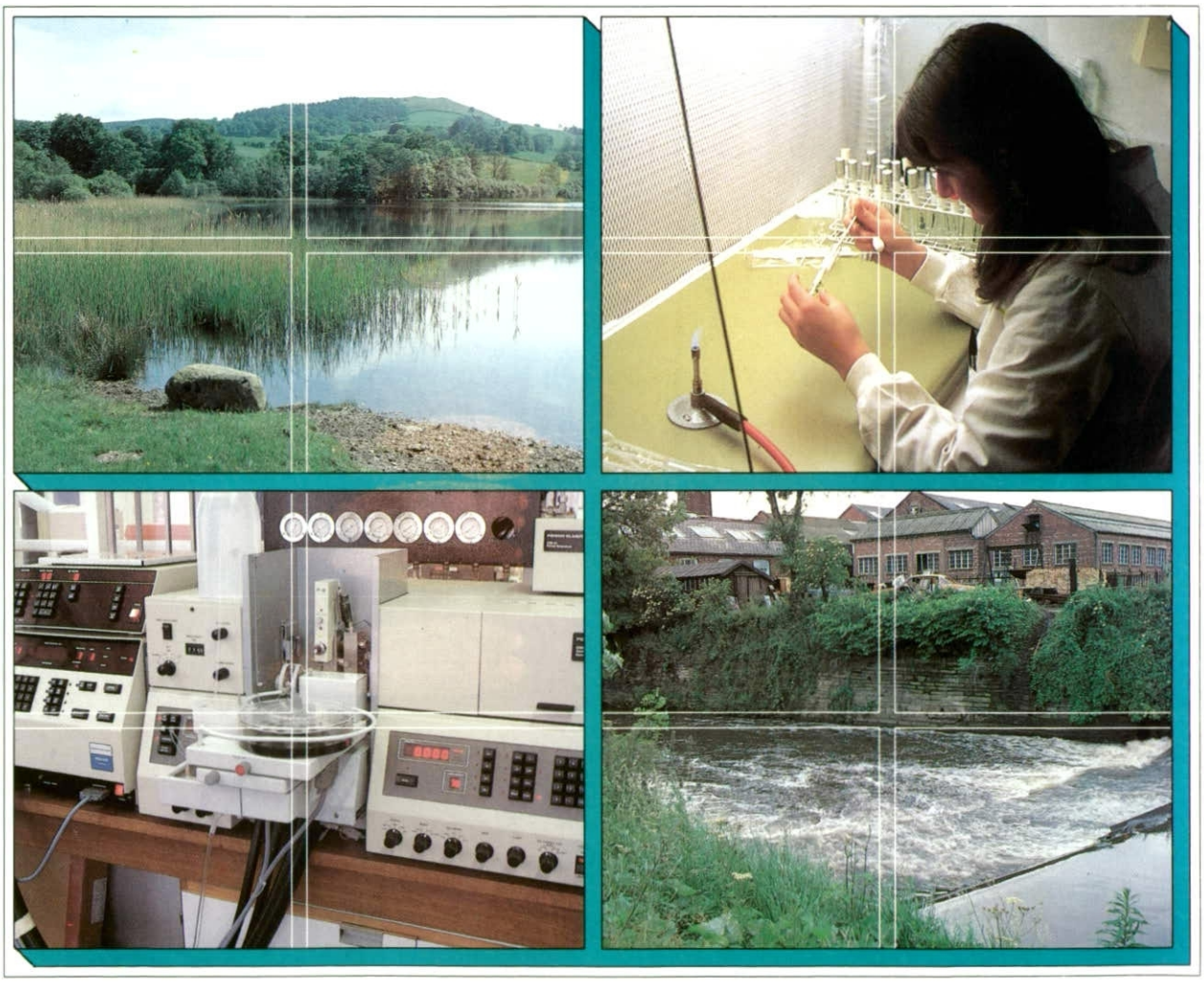

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Executive Summary.

1. Yorkshire Water Services Ltd have made applications for Drought Orders and Time Limited Licences because of the water resource deficit in the region, for which the Environment Agency required a series of macrophyte surveys. Three years of surveys have now been completed. The first in 1996 by Scott Wilson Resource Consultants and subsequent surveys in 1997 and 1998 by the Institute of Freshwater Ecology.

2. The macrophyte surveys were completed following the methodology detailed in Methods for the use of aquatic macrophytes for assessing water quality - 'Blue Book' (HMSO, 1987). Method B from the book was used, which provides a rapid system for assessing abundance of macrophytes in river habitats. A 500m (banklength) survey was completed at each site, recording macrophyte abundance on the 5 point scale (scale A).

3. In addition to the 500m survey a second survey was completed over 100m, located in the centre of the 500m reach. This recorded abundance on the 9 point scale (C scale) to provide finer detail for analysis. Sketch maps of each site were completed, together with photographs of the major plant stands.

4. A total of 79 macrophyte species were recorded from twenty six sites.

5. The 1998 surveys recorded fewer species than in 1996 but generally recorded more than during 1997. During 1996 more marginal species were recorded than in subsequent years.

6. The macro algae *Hildenbrandia rivularis* and *Lemanea fluviatlis* were recorded at more sites in 1998 than in 1997 whereas *Elodea spp, Lemna minor* and *Potamogeton crispus* were recorded at fewer sites in 1998 compared to 1997. *Myriophyllum spicatum* and *Potamogeton perfoliatus* were recorded at the same sites in 1997 and 1998 but generally with much lower densities in 1998.

7. In contrast to the two previous surveys macro algae samples were identified to species level during 1998. The most common macro algae were Cladophora species, which were recorded at 16 of the 26 sites.

8. Average Daily Flow data for one site on each of the three rivers were provided by Yorkshire Water for the period 1995-1998. Flows in the winter of 1995-96 were generally substantially lower than for the same period in 1996-97 and 1997-98. February 1998 was a particularly low flow period in comparison to other years whilst the period of April to July generally had higher flows than recorded for previous years.

9. Mean Trophic Rank (MTR) scores were calculated for each site in each year and show similar trends for all years - relatively low nutrient levels in the upper reaches with a gradual increase in nutrient concentrations downstream. Although this system was not developed to measure flow impacts it would be expected that any

major impacts on the plant populations through reduced flows would be reflected in differences in MTR score between the years. No consistent trends attributable to flow changes were found.

10. The currently available data from three years of surveys on the three rivers do not show any evidence of a long term impact from drought. Species abundance and occurrence within short distances naturally fluctuate in response to flow variations and other environmental factors and although there were some short term impacts, particularly in the marginal fringes, these are no longer apparent in the 1998 survey.

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1. Introduction.

1.1 Background to report.

Yorkshire Water Services Ltd have made applications for Drought Orders and Time Limited Licences because of the water resource deficit in the region. These applications apply to the rivers Wharfe, Ure and Ouse, for which the Environment Agency required a series of macrophyte surveys.

Previous surveys were completed in 1996 (by Scott Wilson Resource Consultants (SWRC)) and in 1997 by ourselves. This report details the third year of surveying.

1.2 Objectives of the project.

The Institute of Freshwater Ecology was contracted to undertake macrophyte surveys at a total of twenty six sites on three rivers (18 on the R. Wharfe, 5 on the R. Ure and 3 on the R. Ouse) during July 1998. These sites were specified by Yorkshire Water Services Ltd.

These surveys were repeats of those carried out in 1997, with one further site required on the river Ouse at Nether Poppleton, downstream of the other sites.

The third year of surveying was undertaken to further establish if there had been, and the extent of, changes in macrophyte populations as recorded in 1996 and 1997.

2. Methodology.

Twenty six sites on the rivers Wharfe (18), Ure (5) and Ouse (3) were surveyed during July 1998 (Table 1), in the order R. Ouse, R. Ure and then R. Wharfe as required by Yorkshire Water Services Ltd (YWS). At each site two macrophyte surveys were completed, together with a sketch map and photographic record.

Table 1. List of sites surveyed during July 1998 by the IFE.

Site	Number	NGR
Wharfe		
Upstream of Starbotton	1	SD 946756
Downstream of Conistone Bridge	2	SD 980672
Upstream of Hebden	3	SE 015626
Appletreewick	4	SE 042602
Dibb, upstream of Dibbles Bridge	5	SE 054637
Downstream of Strid	6	SE 080551
Upstream of Lobwood	7	SE 072523
Addingham (d/s weir)	8	SE 091489
Ilkley	9	SE 124484
Downstream of Burley	10	SE 175463
Knotford	11	SE 223463
Upstream of Riffa Beck	12	SE 255456
The Nunnery	13	SE 288455
Upstream of Collingham	14	SE 354457
Boston Spa	16	SE 369467
Upstream of Woodhall Hotel	15	SE 423465
Upstream of Newton Kyme	17	SE 455457
Upstream of Tadcaster Weir	18	SE 485439
Ure		
Ulshaw	1b	SE 145872
Jervaulx	2	SE 164861
Downstream of Kilgram Bridge intake	2b	SE 191860
Clifton Castle	3	SE 222831
Aldwark	9	SE 468629
Ouse		
At Beningbrough Hall (upstream of Moor Monkton intake)	2	SE 521581
Downstream of Moor Monkton intake	1	SE 536570
Nether Poppleton	3	SE 557552

2.1 Macrophyte surveys.

The survey methodology was identical to the survey of 1997 by the IFE. The macrophyte surveys were completed following Method B methodology detailed in Methods for the use of aquatic macrophytes for assessing water quality - 'Blue Book' (HMSO, 1987).

A 500m (banklength) survey was completed at each site, recording macrophyte abundance on the 5 point scale (scale A). Site locations were determined by the use of sketch maps from the previous two years and confirmed by one surveyor, Peter Scarlett, who had undertaken the surveys in 1997. The extra site on the river Ouse, at Nether Poppleton, was determined by the grid reference supplied by YWS. The exact location of the 500m was determined by suitable access, permanent features to use as landmarks for relocating the site and to be representative of the reach.

As with the 1997 survey it was necessary to use a grapnel to sample deep water areas of the site. The three sites on the Ouse, together with two on the river Ure (1b and 9) and two on the R. Wharfe (11 and 18) were too deep to wade except in the margins. Therefore a grapnel was used intensively in the centre 100 meters of these sites and other species noted from the bank and occasional grapnel sample. This is one of the recommended amendments to the methodology provided in the 'Blue Book'. The use of a boat for unwadeable sections was not required by YWS.

In addition to the 500m survey a second survey was completed over 100m, located in the centre of the 500m reach. This recorded abundance on the 9 point scale (C scale) to provide finer detail for analysis.

The surveys used a standard plant checklist (see survey forms, appendix I) to record species and all specimens were identified at the site were possible. Samples were collected of all species for which detailed examination was required for a definitive identification, including all moss species found. Identification was confirmed at the IFE by the authors or by consultation with external experts (for certain *Potamogeton* samples and for the mosses, of which herbarium samples have been retained at the River Laboratory.).

Plant names as listed in Stace, 1997 and Hill *et al*, 1992 were used for this report.

2.2 Macro algae sampling.

Macro algae species were identified to species level and samples confirmed by D.F. Westlake. During the previous two surveys only filamentous algae were recorded with no identification to species level.

2.3 Additional data collection.

Sketch maps were also completed at each site, marking permanent features, large plant stands, areas of shading and any other notable features (included in Appendix II). Following a request by YWS the 1998 maps included more detail as to the location of major plant stands, shade and permanent features than the 1997 maps.

Photographs were taken of each site and of the major plant stands present at each to provide a visual record of the conditions. These are supplied in Appendix III.

2.4 Data analysis.

Mean Trophic Ranks (MTR) were also calculated for each survey. This system uses 129 macrophytes which are assigned a score (1-10) which reflects the species tolerance

to nutrient enrichment; high values indicate species intolerant of eutrophication. The scores are accumulated for the community and adjusted for the abundance of each species to give an MTR between 10-100. The score is an indication of the extent of general eutrophication at the site rather than an indicator of sewage pollution. For full details refer to Dawson *et al* (1996).

3. Results.

To maintain consistency with the previous surveys we have kept the same site numbers on the R. Wharfe, with site 16 upstream of site 15 and therefore presented in this order in all tables and figures.

3.1 Macrophyte species from 1997 surveys.

Species lists for the three rivers are presented in Table 2 - Table 7. The full survey forms are provided in appendix I. A total of 79 species were recorded over the twenty six sites.

Table 2. Species abundance (5 point scale) recorded at 500m survey sites on the river Wharfe, July 1998.

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	16	15	17	18
Agrostis stolonifera	1	1	1	1		1			1	1			1			1	1	1
Alisma plantago-aquatica																1	1	1
Amblystegium fluviatile						1												
Bumilleria sp											1							
Butomus umbellatus																		1
Callitriche platycarpa																		
Caltha palustris	1		1	1		1	1											
Carex acutiformis	1																	
Carex aquatilis			1	2														
Carex hirta							1											
Carex riparia	1																	
Carex rostrata	1																	
Carex vesicaria	1																	
Cyperus longus							1											
Chiloscyphus polyanthos	1				2	1												
Cinclidotus fontaniloides	1	3	1	1		1	1	1	1						1			
Cladophora glomerata agg		1	1									5	2	3	2	3	3	
Cladophora aegagropila			1			1	1	1	2			2	1	1	1			
Eleocharis palustris							1											
Eleocharis sp.		1																
Elodea canadensis																1		
Elodea nuttallii										1		1		1		3	1	1
Epilobium hirsutum							1						1					
Equisetum fluviatile	1																	
Equisetum palustre			1	1	1													
Fissidens crassipes		1				1												
Fissidens rufulus			1							1			1		1			
Fissidens viridulus					1													
Filamentous algae																		
Fontinalis antipyretica	2	2	1	2	5		1		1	1	1	1	1		1		1	1
Glyceria maxima					1													2
Hildenbrandia rivularis		1	1			1	1	1	1	1	1	2	3	1	3		1	
Hygrohypnum ochraceaum					5													
Iris pseudacorus								1										
Juncus articulatus	1			1			1							1				
Juncus bulbosus	1																	
Juncus effusus					2													
Juncus inflexus	1																	
Jungermannia exsertifolia	1																	
Lemanea fluviatilis	1	1	1	1	1	1	1	1	1	1								
Lemna minor												1			1			
Mentha aquatica	1	1		1		1	1	1		1								
Melosira sp																		2
Mougeotia sp				1														
Myosotis scorpioides		1	1	1			1	1	1	1	1					1	1	1
Myriophyllum spicatum										1	1	2	2	2	2	2	1	1
Nuphar lutea																		3
Octodiceras fontanum																		2
Oedogonium sp								1										
Palmella sp																1		
Pellia sp	1					1												
Persicaria amphibia																1		1

Table 2 (continued)

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	16	15	17	18
Petasites hybridus	1	1				1	1	1	1			1	1					
Phalaris arundinacea	1	1	1	2		1	2	1	1	1	1	3	1	2	2	1	2	2
Potamogeton berchtoldii										1						1		
Potamogeton x cooperii										2				1				
Potamogeton crispus			1							1			1	1		1		
Potamogeton pectinatus												3	4					
Potamogeton perfoliatus										1		2	2	1	1	1	1	1
Racomitrium aciculare					1													
Ranunculus aquatilis			1							1		1	2					
Ran pen. Subsp pseudofluitans										2		1	2	1	2	1		
Rhynchostegium riparoides	1	3	2	3		3	2	3	2	2	1	1	1	1	1	1		
Rorippa sylvestris		1	1	1						1		1	1	1	1		1	
Rumex sp.	1	1		1													1	
Sagittaria sagitifolia																1		1
Salix sp														1				
Scapania undulata					2													
Solanum dulcamara												1						
Sparganium emersum																		1
Sparganium erectum											1		1	1		2	2	2
Thamnobryum alopecorum		1	1															
Tribonema sp					3													
Typha latifolia														1				
Veronica beccabunga												1						

Table 3. Species abundance (9 point scale) recorded at 100m survey sites on the river Wharfe, July 1998.

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	16	15	17	18
Agrostis stolonifera		1	1						1				1			1		1
Alisma plantago-aquatica																	1	1
Amblystegium fluviatile																		
Caltha palustris	1			1														
Carex aquatilis			1															
Carex riparia																		
Carex rostrata																		
Carex vesicaria																		
Chiloscyphus polyanthos	1					1												
Cinclidotus fontaniloides		2		2			1											
Cladophora glomerata agg		1										9	3	2			1	
Cladophora aegagropila			1			1	1		1	2			1	1				
Eleocharis palustris							1											
Eleocharis sp.																		
Elodea canadensis																1		
Elodea nuttallii														2		2	1	1
Epilobium hirsutum													1					
Equisetum fluviatile	1																	
Equisetum palustris				1														
Filamentous algae																		
Fissidens crassipes		1				1												
Fissidens rufulus			1							1								
Fissidens viridulus					1													
Fontinalis antipyretica	2	2	1		5		1		1	1		1	1				1	
Hildenbrandia rivularis		1	1			1	1	1	1	2		1	5	1	1			
Hygrohypnum ochraceaum					6													
Juncus articulatus														1				
Juncus inflexus	1																	
Lemanea fluviatilis				1	1		1	1		1								
Melosira sp																		2
Mentha aquatica		1		1			1											
Myosotis scorpioides									1	1	1					1	1	
Myriophyllum spicatum										2	1	2	4	2	2	2	1	1
Oedogonium sp								1										
Pellia sp.						1												
Persicaria amphibia																1		2
Petasites hybridus							1	1										
Phalaris arundinacea	1			1		1	2	1	1	2	1	2	1	1	1	2	2	2
Potamogeton x cooperii										1				1				
Potamogeton crispus														1				
Potamogeton pectinatus												2	6					
Potamogeton perfoliatus												2	2	1			1	1
Racomitrium aciculare					1													
Ranunculus aquatilis										2			2					
Ran pen. subsp pseudofluitans										2			2	1				
Rhynchostegium riparoides		2	1	4		1	2	4		3			1					
Rorippa sylvestris		1												1	1		1	

Table 3. (continued)

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	16	15	17	18
Rumex sp.		1															1	
Salix sp														1				
Scapania undulata					1													
Sparganium emersum																		1
Sparganium erectum																1	1	1
Thamnobryum alopecorum		1	1															
Tribonema sp					2													
Typha latifolia														1				

Table 4. Species abundance (5 point scale) recorded at 500m sites on the river Ure, July 1998.

Species	1b	2	2b	3	9
Agrostis stolonifera		1	1	1	
Alnus glutinosa		1			
Amblystegium fluviatile		1			
Butomus umbellatus	1				1
Carex riparia	1				
Chiloscyphus polyanthus			1		
Cinclidotus fontinaloides	1	1	1		
Cladophora glomerata	3	1	3	2	
Eleocharis palustris	1	1		1	
Elodea nuttallii					1
Fissidens crassipes			2		
Fissidens rufulus		1		3	
Fontinalis antipyretica		1	3	2	
Lemanea fluviatilis		1	1	1	
Hildenbrandia rivularis		2	3	3	
Juncus articulatus		1			
Mentha aquatica	1				
Myosotis scorpioides	1	1	1		
Pellia sp			1		
Petasites hybridus				1	
Phalaris arundinacea	1	1	1	1	3
Potamogeton pectinatus					3
Ran. pen. subsp. pseudofluitans			3	1	
Rhynchostegium riparoides		3	4	3	
Rorippa sylvestris	1		1	1	
Schoenoplectus lacustris					1
Sparganium erectum					2
Vaucheria sp		1		1	

Table 5. Species abundance (9 point scale) recorded at 100m sites on the river Ure, July 1998.

Species	1b	2	2b	3	9
Agrostis stolonifera		1		1	
Alnus glutinosa		2			
Butomus umbellatus	1				2
Carex acutiforms					
Cinclidotus fontinaloides	1		1		
Cladophora glomerata	5	2	3		
Eleocharis palustris	2	2		1	
Elodea nuttallii					1
Fissidens crassipes			2		
Fissidens rufulus		1		1	
Fontinalis antipyretica		1	4	1	
Lemanea fluviatilis			1	1	
Hildenbrandia rivularis		1	1	2	
Juncus articulatus		1			
Mentha aquatica	1				
Myosotis scorpioides	1	1			
Phalaris arundinacea		2			3
Potamogeton pectinatus					5
Ran. pen. subsp. pseudofluitans			2		
Rhynchostegium riparoides		2	6	1	
Rorippa sylvestris	1		1	1	
Sparganium erectum					3

Table 6. Species abundance (5 point scale) recorded at 500m sites on the river Ouse, July 1998.

Species	2	1	3
Agrostis stolonifera	1		
Amblystegium riparium		1	
Butomus umbellatus	2	1	
Cladophora glomerata	1		1
Epilobium hirsutum			1
Equisetum palustre			1
Fontinalis antipyretica			
Lemna minor			1
Melosira sp		1	
Myriophyllum spicatum	1		
Octodiceras fontanum			
Oedogonium sp		1	
Persicaria amphibia	1		1
Phalaris arundinacea	1	1	1
Potamogeton pectinatus	3	5	4
Rhynchostegium riparioides	1		
Rorippa sylvestris	1		
Rumex sp.	1	1	
Sagittaria sagittifolia	1		
Salix sp.	1		
Schoenoplectus lacustris	1		

Table 7. Species abundance (9 point scale) recorded at 100m sites on the river Ouse, July 1998.

Species	2	1	3
Butomus umbellatus	1	1	
Cladopora glomerata			1
Octodiceras fontanum			
Phalaris arundinacea	1	1	1
Potamogeton pectinatus	2	6	5
Rhynchostegium riparioides	1		
Rorippa sylvestris			1
Salix sp.	1		

3.2 Flow data.

From data supplied by Yorkshire Water Services four weekly average flow has been calculated for one site on each river (Figure 1). As previously discussed (IFE, 1997) summer flows were similar for the period 1995-1997. The most critical difference was the lower flow levels in the winter of 1995/96 compared to the two subsequent years.

Flow levels in winter 1997/98 were similar to those in 1996/97 with high discharges at all three monitoring points. February 1998 was a particularly low flow period in comparison to other years whilst the period of April to July generally had higher flows than recorded for previous years.

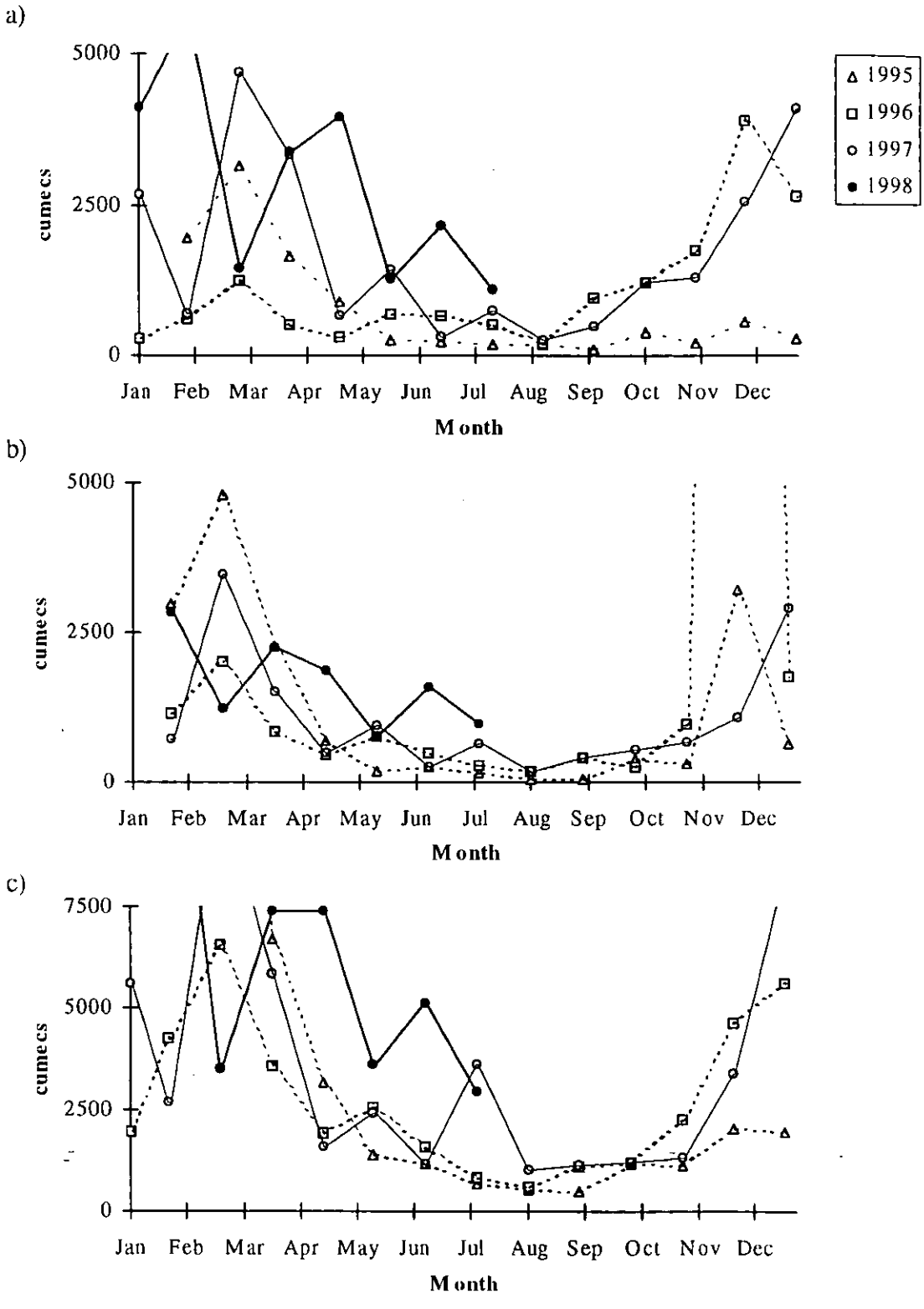


Figure 1. Average monthly flows for a) River Wharfe, b) River Ure and c) River Ouse, 1995-1998.

3.3 Comparison of 1998 with previous years surveys.

As previously discussed (IFE, 1997) fewer species were recorded in 1997 compared to the 1996 surveys. The 1998 surveys also recorded fewer species than in 1996 but generally recorded more than during 1997 (Table 8). During 1996 more marginal species were recorded than in subsequent years.

Table 8. Numbers of species recorded at 500m survey sites in 1996-1998.

Wharfe	No. spp				
	1996	1997	1998	% of 1996	% of 1997
1	36	18	21	61	117
2	25	13	16	64	123
3	23	14	18	78	129
4	30	15	15	53	100
5		10	11		110
6	25	12	14	52	117
7	32	21	16	50	76
8	27	19	11	41	58
9	22	18	10	82	56
10	32	20	18	63	90
11	15	5	8	53	160
12	21	22	17	86	77
13	19	20	18	100	90
14	21	16	16	76	100
16	28	16	13	50	81
15	14	14	17	121	121
17	17	17	13	82	76
18	19	11	17	95	155

Ure	No. spp				
	1996	1997	1998	% of 1996	% of 1997
1b		12	9		75
2	20	11	15	80	136
2b		11	14		127
3	28	16	13	50	81
9	19	7	6	32	86

3.3.1 Differences in records of marginal species.

Assessment of the previous two years surveys revealed a significant decrease in the number and abundance of marginal species recorded at sites in 1997 compared to the 1996 survey (Table 10 p20, IFE 1997).

There has been some increase in marginal plant species compared to 1997 but not to the levels recorded in 1996. In particular *Rorippa nasturtium-aquaticum* and the two alien invasive species *Impatiens glandulifera* and *Mimulus guttatus* were still not recorded in 1998 although they were observed on the bankside out of the survey area.

The other common marginal species that were absent from the 1997 surveys were recorded during 1998 although not as frequently as in 1996.

3.3.2 Differences in records of aquatic plants.

Previous comparisons of the aquatic plant populations (IFE, 1997) found some changes, some species were more abundant in one year than the other (e.g. *Potamogeton crispus*) whilst other plants were found at a site in one year but at a different one in the other (e.g. *Potamogeton pectinatus*).

A comparison between the 1998 and 1997 surveys indicates some changes in the aquatic plant communities, which are described below.

Increases in plants.
The macro algae *Hildenbrandia rivularis* and *Lemanea fluviatlis* were recorded at more sites in 1998 than in 1997.

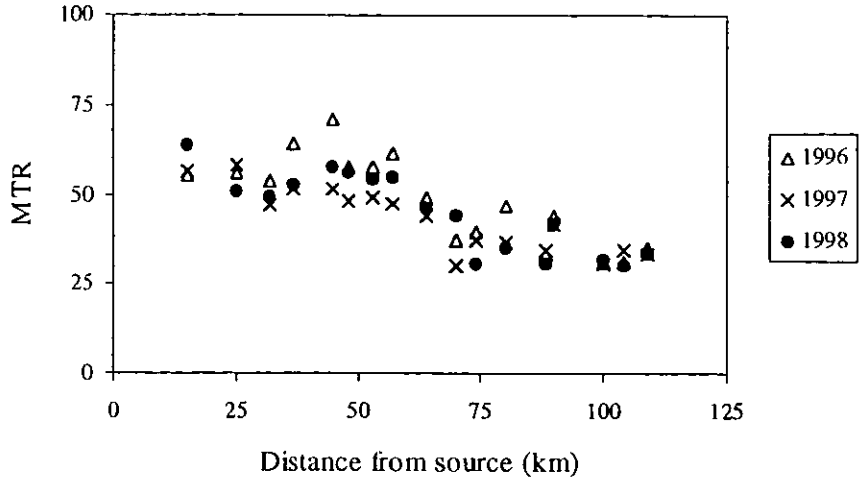
Decreases in plants.
Elodea spp, Lemna minor and *Potamogeton crispus* were recorded at fewer sites in 1998 compared to 1997. *Myriophyllum spicatum* and *Potamogeton perfoliatus* were recorded at the same sites in 1997 and 1998 but generally with much lower densities in 1998.

3.4 Plant scores and river types.

The Mean Trophic Rank for each site in each year is presented in Figure 2.

There is a general pattern of decreasing MTR scores from upstream to downstream sites on the R. Wharfe and R. Ure for all years

a)



b)

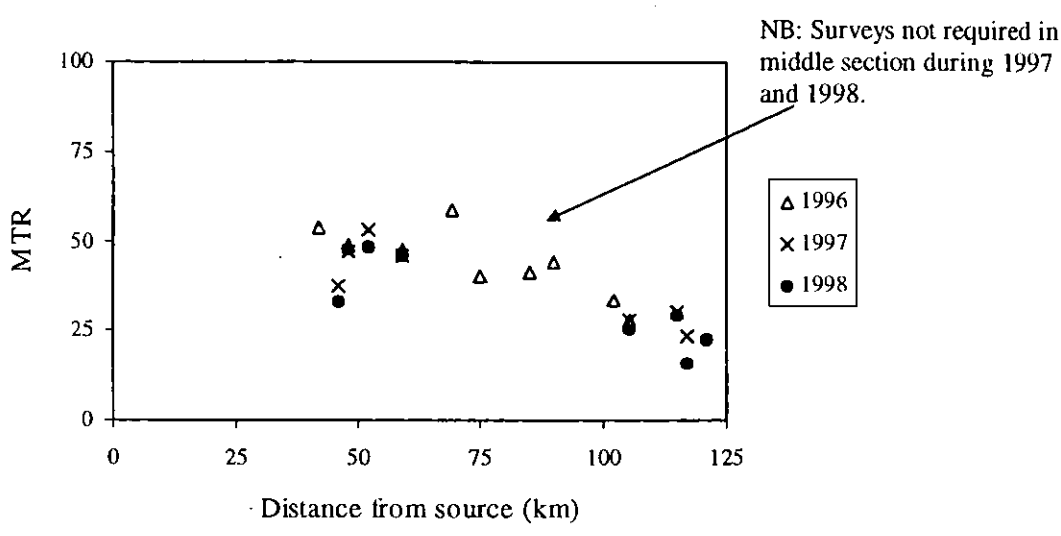


Figure 2. Mean Trophic Rank for three years of surveys on the a) river Wharfe and b) river Ure / Ouse.

3.5 Comparison between 500m and 100m surveys.

The additional 100m surveys were completed by the same surveyors during the same visit as the 500m surveys. They were located in the centre of each 500m section and recorded plant cover in greater detail, using the 9 point scale.

By reducing the survey area a proportion of plant species were missed for each site. On average the 100m surveys recorded 58 percent of the species found over the full 500m.

The Mean Trophic Rank for the 100m reach is generally not significantly different from the value for the 500m reach (Figure 3). The cases where the MTR is less for the 100m survey are due to the low number of scoring species being present in the site, when the absence of one or two from the shorter survey can significantly affect the MTR.

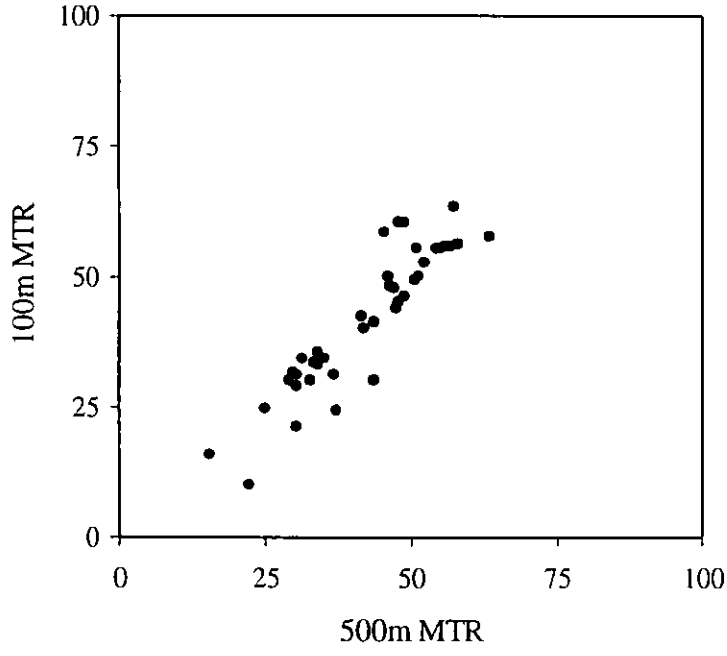


Figure 3. Mean Trophic Rank for 100m surveys against the 500m survey at the same site.

3.6 Algal analysis.

In contrast to the two previous surveys macro algae samples were identified to species level during 1998.

The most common macro algae were Cladophora species, which were recorded at 16 of the 26 sites. Two species were recorded, Cladophora glomerata and C. aegagropila. The later forms dense, short mats on boulders and rocks and was associated with the upper sites on the river Wharfe. C.glomerata is associated with lower velocity flow and forms larger, spreading mats which can cover other macrophytes. This was most abundant in the lower reaches of the R.Wharfe and in the R.Ure and R.Ouse. Other

common algae were the red encrusting alga *Hildenbrandia rivularis* and the filamentous *Lemanea fluviatilis.*

Algal densities were never high enough to constitute a nuisance, rarely forming large mats or smothering macrophytes. Diatoms and silt were observed on many plants, particularly *Myriophyllum spicatum* and occasionally appeared to be affecting the growth of the macrophyte but there was much less growth than in 1997, possibly due to different survey times or to different environmental conditions.

4. Discussion.

Three years of data on the status of plant populations in the R. Ouse, R. Wharfe and R. Ure have now been collected for the period following Drought Order and Time Limited Licences application. The assessment of the 1997 data (IFE, 1997) concluded that there was insufficient evidence to determine whether there had been an impact from the drought. The third year has now provided the additional information necessary for a full assessment.

4.1 The status of macrophyte populations in 1998.

The upper reaches of the Wharfe and Ure were typical of spatey rivers, with cobble and pebble substrate dominating and a relatively low density of instream vegetation. Following heavy rainfall the high energy flow will scour the main river channel reducing the opportunities for instream macrophyte growth. At several sites there was evidence of significant damage to macrophytes, particularly *Potamogeton perfoliatus.* This could account for the lower density of some species compared to previous years surveys as there was notably more flow during spring 1998 compared to the same period in previous years (Figure 1).

Rorippa sylvestris was recorded at many sites where it was always found in the shallow and exposed areas as seedlings, never as more mature plants. This indicates heavy scouring of the river channel during the winter months which would have removed any plants from the previous year.

There was very little evidence of epiphytic algae growth at most sites and areas which had been noted as having extensive diatom films in previous years were generally clear of algae. Epiphytic algae were recorded in areas of slow flow and consisted mainly of diatom films. Dense growth of macro algae species such as *Cladophora* was not observed. The exception was at site 12 (upstream of Riffa Beck) on the R. Wharfe where diatoms and filamentous algae were particularly noted as smothering plants and that *Ranunculus* and *Potamogeton* species were in poor condition as a result.

The macrophyte populations appeared in reasonable health although it was noted that the density of many species was noticeably less than in previous surveys. A large bed of *Ranunculus* present at site 3 (upstream of Hebden) on the R. Wharfe in 1997 and 1996 was completely absent in 1998. At Ilkley (R. Wharfe 9) we did not record *Potamogeton perfoliatus, P. crispus, Elodea canadensis or E. nuttallii* which had been recorded in previous years and the site as Knotford (R. Wharfe 11) was also noted as having much less vegetation than in 1997.

The 1998 surveys were undertaken a month earlier than during 1996 or 1997. Major increases in biomass can occur during one month in the summer growing season. The wet spring and early summer of 1998 may have also affected growth rates. These two factors may have had an affect on the abundance of vegetation recorded during 1998 when compared to earlier surveys.

As in 1997 the site on the R. Dibb.(R. Wharfe 5) was particularly notable for having an extremely high cover of bryophytes which were above the current water level. The

location of this site below a reservoir will mean that flow levels are regularly controlled and fluctuate considerably. The stranding of mosses and algae on exposed boulders at this site is therefore not indicative of abnormal low flows.

The Mean Trophic Ranks for each river indicate a gradual increase in nutrient loading along the river from the upper reaches to the lowland areas and is consistent both with previous years scores (Figure 2) and with other rivers on which similar surveys have been undertaken (e.g. R. Eden and R. Ribble, Dawson *et al*, 1996).

4.2 Assessment changes in plant populations between 1996 and 1998.

The most significant differences between the 1996 and 1997 surveys were the changes in numbers and abundance of marginal plants (IFE, 1997). During 1996 marginal species, such as *Rorippa nasturtium–aquaticum, Veronica beccabunga, Imaptiens glandulifera* and *Mimulus guttatus,* were recorded at significantly more sites than in 1997. This was probably due to low flows and less scouring of the river during the winter of 1995/96 which allowed marginal species to colonise and remain established in the channel. Higher flows over the winter of1996/97 would have removed these plants.

Marginal plants in 1998 were more abundant than in 1997 but had not reached abundances recorded in 1996. This would indicate some colonisation of the river channel even though river levels were higher during early 1998 compared to the same period in 1997. It is likely that the populations of these marginal species fluctuate in response to a variety of environmental conditions including flow levels and the extent of scouring during flood events and that the effect of the drought was just an extreme event in the normal cycle. There is no evidence that the drought had any long term affect on marginal plant populations although there was a short term impact resulting in a greater number of species growing in the river channelas the plants took advantage of lower velocities.

In contrast to the clear differences in marginal species submerged plant species showed no clear pattern of changes between 1996 and 1997 (IFE, 1997). Some species were more abundant in 1997 (e.g. *Fontinalis antipyretica, Potamogeton crispus* and *Persicaria amphibia*) and the sites where others were recorded had changed between years (e.g *Elodea spp* and *Potamogeton pectinatus*). There was no consistent trend in changes between the two years.

Submerged species were generally recorded at the same sites in 1998 as in 1997. The macro algae *Hildenbrandia rivularis* and *Lemanea fluviatilis* were present at more sites than in 1997 and *Elodea spp. and Potamogeton crispus* were recorded at fewer sites in 1998. At many sites the abundance of some species was considerably less than in 1997, particularly for *Potamogeton perfoliatus* and *Myriophyllum spicatum.* These species often showed signs of physical damage (e.g broken stems) presumed to be due to scouring from high flows earlier in the year.

Three aquatic species were highlighted as having particularly significant changes in the 1997 survey report (IFE, 1997), *Ranunculus* spp, *Fontinalis antipyretica* and *Potamogeton crispus.* As noted the most suitable habitat for *Ranunculus* spp is a flow velocity of 15-50 cms^{-1} and a depth of 15-45(60) cm (Dawson, 1976, Mountford and

Gnomes, 1990 and NRA, 1993). Occurrences of *Ranunculus* spp in 1998 were similar to 1997 which supports the conclusion that there was a recovery from the 1996 drought impacted conditions when lower velocities and shallower water might have made the sites less favourable. This could reoccur in future years with similar affects.

Fontinalis antipyretica was found at a similar number of sites in 1998 and 1997 which represents a significant increase over the 1996 population size, probably due to recovery following the drought. In contrast *P. crispus* was found at fewer sites in 1998 than in 1997 and, as it is not a robust plant, was possibly impacted by the high flows earlier in the year.

Aquatic macrophyte populations are known to increase and decrease between years in cycles of approximately four to ten years depending on the species and many of the changes observed are likely to be entirely natural.

There were no apparent trends in the changes of submerged aquatic plant populations between the three years of surveys. Any impacts caused by the drought have been short term and are now no more significant than other natural fluctuations.

Although the MTR is not designed to monitor drought the similarity between MTR scores for all three years (Figure 2) supports the evidence for no long term impact. Any significant change in the plant communities due to drought would be likely to result in a change in MTR score which was not observed.

5. Conclusions.

Three years data are now available for assessment of the possible impact of drought on the macrophyte populations of the rivers Wharfe, Ure and Ouse. The surveys were generally carried out at the same sites in each year with some additional sites added in 1997 and 1998.

Significant changes were observed in the marginal macrophyte populations between 1996 and 1997, with more species and a greater abundance in 1996. The 1998 situation also had significantly less marginal plants than 1996 although more were recorded than in 1997. These changes are likely to be due to substantially lower flows in the winter of 1995-96 compared to 1996-97 and 1997-98. Lower flows will have reduced the erosion of marginal deposits and plants which were then more abundant in the following season. Subsequently the return to normal higher flow conditions will probably have removed those plants which had colonised the river channel.

Submerged aquatic plant populations showed a less clear trend over the three year period. Some species were more abundant during 1996 and others were more abundant in subsequent years. The number of sites at which a some species were recorded also changed significantly. With the exception of the increase in number of sites with *Ranunculus* spp. there was no consistent increase in species preferring higher flows.

The currently available data from three years of surveys on the three rivers do not show any evidence of a long term impact from drought. Species abundance and occurrence within short distances naturally fluctuate in response to flow variations and other environmental factors and although there were some short term impacts, particularly in the marginal fringes, these are no longer apparent in the 1998 survey.

In the 1997 report we recommended comparison with historical data to establish a proper baseline for the rivers. This would still be advantageous and might be available through negotiation with English Nature who hold the Conservation Rivers Macrophyte database which has records for the 1970s and 80s for these rivers.

6. References.

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Appendix I. Survey forms.

Macrophyte Survey Form

River: Ouse
Site name: 2, at Benningbrough Hall
Length: 500 m
Scale used: (A) C (delete as appropriate)

NGR: SE 521581
Date: 7/7/98
Surveyor: MG/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg. (A)	1	1
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (A)	1	1
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum	1	1
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium	1	1
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus	3	2
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus	5	3
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia	1	1
Schoenoplectus lacustris	2	1
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Salix sp		1	1
Rorippa sylvestris		1	1
Agrostis stolonifera		1	1
Phalaris arundinacea		2	1
Rumex sp		1	1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale. 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100% ☐

Depth (m) <0.25 1 % ☐ 0.25-0.5 2 % ☐ >0.5-1 2 % ☐ >1.0 95 % ☐

Substrate Bedrock ___% ☐ Boulders ___% ☐ Cobbles ___% ☐ Pebbles ___% ☐ Gravel ___% ☐

Sand 3 % ☐ Silt/Mud 2 % ☐ Clay ___% ☐ Peat ___% ☐ Not visible 95

Habitat Pool ___% ☐ Slack 100 % ☐ Riffle ___% ☐ Run ___% ☐

Shading: Left Bank None 95 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 5 % ☐

Right Bank None 95% ☐ Slight ___% ☐ Mod. ___% ☐ Dense 5 % ☐

Water Clarity Clear 10 % ☐ Cloudy 90 % ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable ___% ☐ Unstble 80% ☐ Soft 20 % ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) ☐

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

Deep, wide, gravel bed
Centre of channel unvegetated
Potamogeton pectinatus dominant
Little algal growth

Macrophyte Survey Form

River: Ouse
Site name: 2, at Beningbrough Hall
Length: 100 m
Scale used: A (C) (delete as appropriate)

NGR: SE 521581
Date: 7/7/98
Surveyor: PS/MG

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatilis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (A)		1
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *peniciliatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		1
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		2
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton tricholdes		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE		
Phalaris arundinacea			1
Salix sp			1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100 % ☐

Depth (m) <0.25 1 % ☐ 0.25-0.5 2 % ☐ >0.5-1 2 % ☐ >1.0 95 % ☐

Substrate Bedrock ___% ☐ Boulders ___% ☐ Cobbles ___% ☐ Pebbles ___% ☐ Gravel ___% ☐

Sand 3 % ☐ Silt/Mud 2 % ☐ Clay ___% ☐ Peat ___% ☐ Not visible 95

Habitat Pool ___% ☐ Slack 100 % ☐ Riffle ___% ☐ Run ___% ☐

Shading: Left Bank None 95 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 5 % ☐

Right Bank None 95 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 5 % ☐

Water Clarity Clear 10 % ☐ Cloudy 90 % ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable ___% ☐ Unstble 80 % ☐ Soft 20 % ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) ☐

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

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Macrophyte Survey Form

River: Ouse
Site name: 1,dls Moor Monkton intake
Length: 500m
Scale used: (A) C (delete as appropriate)

NGR: SE 536570
Date: 7/7/98
Surveyor: PS/MG

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium (A)	1	1
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *peniciliatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus	2	1
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus	S	S
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton tricholdes		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Melosira sp	A	1	1
Oedogonium sp	B	1	1
Rumex sp		1	1
Phalaris arundinacea		1	1

%	C	A
<0.1%	1	1
0.1-1%	2	2
1-2.5%	3	3
2.5-5%	4	3
5-10%	5	4
10-25%	6	5
25-50%	7	5
50-75%	8	5
>75%	9	5

Area

Physical Records River: NGR:

(Use 3 point scale. 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100% ☐

Depth (m) <0.25 1 % ☐ 0.25-0.5 1 % ☐ >0.5-1 1 % ☐ >1.0 97 % ☐

Substrate Bedrock ___% ☐ Boulders ___% ☐ Cobbles ___% ☐ Pebbles ___% ☐ Gravel ___% ☐

Sand 3 % ☐ Silt/Mud 2 % ☐ Clay ___% ☐ Peat ___% ☐ Not visible 95

Habitat Pool ___% ☐ Slack 100% ☐ Riffle ___% ☐ Run ___% ☐

Shading: Left Bank None 98 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 2 % ☐

Right Bank None 100 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense ___% ☐

Water Clarity Clear 10 % ☐ Cloudy 90% ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable ___% ☐ Unstble 80% ☐ Soft 20% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Ouse 2 **Comparability** A

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) C

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

Potamogeton pectinatus dominates –
Largely not visible substrates –
Graph not used
Potamogeton perfoliatus / Elodea not recorded this time.

Macrophyte Survey Form

River: Ouse
Site name: 1, dls Moor Monkton intake
Length: 100m
Scale used: A / (C) (delete as appropriate)

NGR: SE 536570
Date: 7/7/98
Surveyor: MG/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		1
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		6
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE		
Phalaris arundinacea			1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100 % ☐

Depth (m) <0.25 1 % ☐ 0.25-0.5 1 % ☐ >0.5-1 1 % ☐ >1.0 97 % ☐

Substrate Bedrock___% ☐ Boulders___% ☐ Cobbles___% ☐ Pebbles___% ☐ Gravel___% ☐

Sand 3 % ☐ Silt/Mud 2 % ☐ Clay ___% ☐ Peat ___% ☐ Not visible 95

Habitat Pool ___% ☐ Slack 100 % ☐ Riffle ___% ☐ Run ___% ☐

Shading: Left Bank None 95 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 5 % ☐

Right Bank None 100 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense ___% ☐

Water Clarity Clear 10 % ☐ Cloudy 90 % ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable ___% ☐ Unstble 90% ☐ Soft 10 % ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Ouse 2 **Comparability** A

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) B

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

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Macrophyte Survey Form

River: Ouse
Site name: 3, Nether Poppleton
Length: 500m
Scale used: (A) / C (delete as appropriate)

NGR: SE 557552
Date: 7/7/98
Surveyor: MG/PS

	Rel	Cov		Rel	Cov		Rel	Cov
ALGAE			*Lotus pedunculatus*			*Lemna trisulca*		
Batrachospermum sp			*Menyanthes trifoliata*			*Phragmites australis*		
Hildenbrandia rivularis			*Montia fontana*			*Potamogeton alpinus*		
Lemanea fluviatilis			*Myriophyllum alterniflorum*			*Potamogeton berchtoldii*		
Vaucheria sp			*Myriophyllum spicatum*			*Potamogeton crispus*		
Enteromorpha sp			*Nuphar lutea*			*Potamogeton freisii*		
Stigeoclonium tenue			*Nymphaea alba*			*Potamogeton gramineus*		
Hydrodictyum reticulatum			*Nymphoides peltata*			*Potamogeton lucens*		
Cladophora agg. (A)	1	1	*Oenanthe crocata*			*Potamogeton natans*		
LIVERWORTS			*Oenanthe fluviatilis*			*Potamogeton obtusifolius*		
Chiloscyphus polyanthos			*Polygonum amphibium*	1	1	*Potamogeton pectinatus*	5	4
Jungermania atrovirens			*Potentilla erecta*			*Potamogeton perfoliatus*		
Marsupella emarginata			*Ranunculus aquatilis*			*Potamogeton polygonifolius*		
Nardia compressa			*Ran. penic.* subsp *pseudofluitans*			*Potamogeton praelongus*		
Pellia endiviifolia			*Ran. penic.* subsp *penicillatus*			*Potamogeton pusillus*		
Pellia epiphylla			*Ran. penic.* subsp *vertumnus*			*Potamogeton trichoides*		
Scapania undulata			*Ranunculus circinatus*			*Sagittaria sagittifolia*		
MOSSES			*Ranunculus flammula*			*Schoenoplectus lacustris*		
Amblystegium fluviatile			*Ranunculus fluitans*			*Sparganium emersum*		
Amblystegium riparium			*Ranunculus hederaceus*			*Sparganium erectum*		
Blindia acuta			*Ranunculus omiophyllus*			*Spirodela polyrhiza*		
Brachythecium plumosum			*Ranunculus peltatus*			*Typha latifolia*		
Brachythecium rivulare			*Ranunculus trichophyllus*			*Typha angustifolia*		
Brachythecium rutabulum			*Ranunculus sceleratus*			*Zannichellia palustris*		
Bryum pseudotriquetrum			*Rorippa amphibia*					
Calliergon cuspidatum			*Rorippa nasturtium-aquaticum*			OTHER SPECIES / SAMPLE		
Cinclidotus fontinaloides			*Rumex hydrolopathum*			Phalaris arundinaceae	2	1
Dichodontium flavescens			*Veronica anagallis-aquatica*			Rorippa sylvestris	1	1
Dichodontium palustre			*Veronica catenata*			Epilobium hirsutum	1	1
Dicranella palustris			*Veronica scutellata*					
Fontinalis antipyretica			*Viola palustris*					
Fontinalis squamosa			MONOCOTYLEDONS					
Hygrohypnum luridum			*Acorus calamus*					
Hygrohypnum ochraceum			*Alisma plantago aquatica*					
Hyocomium armoricum			*Alisma lanceolatum*					
Philonotis fontana			*Bolboschoenus maritimus*					
Polytrichum commune			*Butomus umbellatus*					
Racomitrium aciculare			*Carex acuta*					
Rhynchostegium riparioides			*Carex acutiformis*					
Sphagnum species			*Carex riparia*					
Thamnobryum alopecurum			*Carex rostrata*					
VASCULAR CRYPTOGRAMS			*Carex vesicaria*					
Azolla filiculoides			*Catabrosa aquatica*					
Equisetum fluviatile			*Eleocharis palustris*					
Equisetum palustre	1	1	*Eleogiton fluitans*					
DICOTYLEDONS			*Elodea canadensis*					
Apium inundatum			*Elodea nuttallii*					
Apium nodiflorum			*Glyceria maxima*					
Berula erecta			*Groenlandia densa*					
Callitriche hamulata			*Hydrocharis morsus-ranae*					
Callitriche obtusangula			*Iris pseudacorus*					
Ceratophyllum demersum			*Juncus bulbosus*					
Hippurus vulgaris			*Lemna gibba*					
Littorella uniflora			*Lemna minor*	1	1			

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100% ☐

Depth (m) <0.25 5% ☐ 0.25-0.5 5% ☐ >0.5-1 5% ☐ >1.0 85% ☐

Substrate Bedrock ___% ☐ Boulders ___% ☐ Cobbles ___% ☐ Pebbles ___% ☐ Gravel ___% ☐

Sand 3% ☐ Silt/Mud 5% ☐ Clay ___% ☐ Peat ___% ☐ Not visible 92

Habitat Pool ___% ☐ Slack 100% ☐ Riffle ___% ☐ Run ___% ☐

Shading: Left Bank None 90% ☐ Slight ___% ☐ Mod. ___% ☐ Dense 10% ☐

Right Bank None 95% ☐ Slight ___% ☐ Mod. ___% ☐ Dense 5% ☐

Water Clarity Clear 20% ☐ Cloudy 80% ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable ___% ☐ Unstble 80% ☐ Soft 20% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites	Ouse 1	**Comparability** I
Sites	Ouse 2	**Comparability** I
Sites		**Comparability**

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) B

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes		
Algae		
Others		

Comments (including observations on plant condition, algal and epiphyte growth)

Potamogeton pectinatus dominates
Grapnel used
Centre of channel unvegetated.

Macrophyte Survey Form

River: Ouse
Site name: 3, Nether Poppleton
Length: 100m
Scale used: A / (C) (delete as appropriate)

NGR: SE 557552
Date: 7/7/98
Surveyor: MG/PS

	Rel	Cov		Rel	Cov		Rel	Cov
ALGAE			*Lotus pedunculatus*			*Lemna trisulca*		
Batrachospermum sp			*Menyanthes trifoliata*			*Phragmites australis*		
Hildenbrandia rivularis			*Montia fontana*			*Potamogeton alpinus*		
Lemanea fluviatillis			*Myriophyllum alterniflorum*			*Potamogeton berchtoldii*		
Vaucheria sp			*Myriophyllum spicatum*			*Potamogeton crispus*		
Enteromorpha sp			*Nuphar lutea*			*Potamogeton freisii*		
Stigeoclonium tenue			*Nymphaea alba*			*Potamogeton gramineus*		
Hydrodictyum reticulatum			*Nymphoides peltata*			*Potamogeton lucens*		
Cladophora agg. (A)	1	1	*Oenanthe crocata*			*Potamogeton natans*		
LIVERWORTS			*Oenanthe fluviatilis*			*Potamogeton obtusifolius*		
Chiloscyphus polyanthos			*Polygonum amphibium*			*Potamogeton pectinatus*		5
Jungermania atrovirens			*Potentilla erecta*			*Potamogeton perfoliatus*		
Marsupella emarginata			*Ranunculus aquatilis*			*Potamogeton polygonifolius*		
Nardia compressa			*Ran. penic.* subsp *pseudofluitans*			*Potamogeton praelongus*		
Pellia endiviifolia			*Ran. penic.* subsp *penicillatus*			*Potamogeton pusillus*		
Pellia epiphylla			*Ran. penic.* subsp *vertumnus*			*Potamogeton tricholdes*		
Scapania undulata			*Ranunculus circinatus*			*Sagittaria sagittifolia*		
MOSSES			*Ranunculus flammula*			*Schoenoplectus lacustris*		
Amblystegium fluviatile			*Ranunculus fluitans*			*Sparganium emersum*		
Amblystegium riparium			*Ranunculus hederaceus*			*Sparganium erectum*		
Blindia acuta			*Ranunculus omiophyllus*			*Spirodela polyrhiza*		
Brachythecium plumosum			*Ranunculus peltatus*			*Typha latifolia*		
Brachythecium rivulare			*Ranunculus trichophyllus*			*Typha angustifolia*		
Brachythecium rutabulum			*Ranunculus sceleratus*			*Zannichellia palustris*		
Bryum pseudotriquetrum			*Rorippa amphibia*					
Calliergon cuspidatum			*Rorippa nasturtium-aquaticum*			OTHER SPECIES / SAMPLE		
Cinclidotus fontinaloides			*Rumex hydrolopathum*			Phalaris arundinacea		1
Dichodontium flavescens			*Veronica anagallis-aquatica*			Rorippa sylvestris		1
Dichodontium palustre			*Veronica catenata*					
Dicranella palustris			*Veronica scutellata*					
Fontinalis antipyretica			*Viola palustris*					
Fontinalis squamosa			MONOCOTYLEDONS					
Hygrohypnum luridum			*Acorus calamus*					
Hygrohypnum ochraceum			*Alisma plantago aquatica*					
Hyocomium armoricum			*Alisma lanceolatum*					
Philonotis fontana			*Bolboschoenus maritimus*					
Polytrichum commune			*Butomus umbellatus*					
Racomitrium aciculare			*Carex acuta*					
Rhynchostegium riparioides			*Carex acutiforms*					
Sphagnum species			*Carex riparia*					
Thamnobryum alopecurum			*Carex rostrata*					
VASCULAR CRYPTOGRAMS			*Carex vesicaria*					
Azolla filiculoides			*Catabrosa aquatica*					
Equisetum fluviatile			*Eleocharis palustris*					
Equisetum palustre			*Eleogiton fluitans*					
DICOTYLEDONS			*Elodea canadensis*					
Apium inundatum			*Elodea nuttallii*					
Apium nodiflorum			*Glyceria maxima*					
Berula erecta			*Groenlandia densa*					
Callitriche hamulata			*Hydrocharis morsus-ranae*					
Callitriche obtusangula			*Iris pseudacorus*					
Ceratophyllum demersum			*Juncus bulbosus*					
Hippurus vulgaris			*Lemna gibba*					
Littorella uniflora			*Lemna minor*					

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100 % ☐

Depth (m) <0.25 5 % ☐ 0.25-0.5 5 % ☐ >0.5-1 5 % ☐ >1.0 85 % ☐

Substrate Bedrock___% ☐ Boulders__% ☐ Cobbles__% ☐ Pebbles___% ☐ Gravel__% ☐

Sand 2 % ☐ Silt/Mud 8 % ☐ Clay ___% ☐ Peat ___% ☐ Not visible 90

Habitat Pool ___% ☐ Slack 100 % ☐ Riffle ___% ☐ Run ___% ☐

Shading: Left Bank None 90 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 10 % ☐

Right Bank None 95 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 5 % ☐

Water Clarity Clear 20 % ☐ Cloudy 80 % ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable ___% ☐ Unstble 80% ☐ Soft 20% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Ouse 1 **Comparability** A

Sites Ouse 2 **Comparability** A

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) B

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

Macrophyte Survey Form

River: Ure
Site name: 1b, Ulshaw
Length: 500 m
Scale used (A) B (delete as appropriate)

NGR: SE 145872
Date: 8/7/98
Surveyor: MG/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatilis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg. (A)	5	3
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides (A)	1	1
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus	1	1
Carex acuta		
Carex acutiformis		
Carex riparia (A)	1	1
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris	2	1
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton tricholdes		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Myosotis scorpioides		1	1
Phalaris arundinacea		1	1
Mentha aquatica		1	1
Rorippa sylvestris		1	1

%	C	A
<0.1%	1	1
0.1-1%	2	2
1-2.5%	3	3
2.5-5%	4	3
5-10%	5	4
10-25%	6	5
25-50%	7	5
50-75%	8	5
>75%	9	5

Area

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100 % ☐

Depth (m) <0.25 3 % ☐ 0.25-0.5 1 % ☐ >0.5-1 1 % ☐ >1.0 95 % ☐

Substrate Bedrock ___% ☐ Boulders 1 % ☐ Cobbles 10 % ☐ Pebbles ___% ☐ Gravel ___% ☐

Sand 3 % ☐ Silt/Mud 4 % ☐ Clay 2 % ☐ Peat ___% ☐ Not visible 80

Habitat Pool ___% ☐ Slack 100 % ☐ Riffle ___% ☐ Run ___% ☐

Shading: Left Bank None 95 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 5 % ☐

Right Bank None 92 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 8 % ☐

Water Clarity Clear 10 % ☐ Cloudy 90 % ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 30 % ☐ Unstble 60 % ☐ Soft 10 % ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) ☐

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

Gravel used
Very few aquatic plants present
Marginals - occasional but often well above survey area
Algae most abundant on cobbles in shallows

Macrophyte Survey Form

River: Ure
Site name: 1b, Ulshaw
Length: 100 m
Scale used: A / (C) (delete as appropriate)

NGR: SE 145872
Date: 8/7/98
Surveyor: MG/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatilis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg. (A)		5
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides (A)		1
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		1
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		2
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE		
Rorippa sylvestris			1
Mentha aquatica			1
Myosotis scorpioides			1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100% ☐

Depth (m) <0.25 10 % ☐ 0.25-0.5 5 % ☐ >0.5-1 5 % ☐ >1.0 80 % ☐

Substrate Bedrock ___% ☐ Boulders 2 % ☐ Cobbles 30 % ☐ Pebbles ___% ☐ Gravel ___% ☐

Sand 3 % ☐ Silt/Mud 10 % ☐ Clay 5 % ☐ Peat ___% ☐ Not visible 50

Habitat Pool ___% ☐ Slack 100% ☐ Riffle ___% ☐ Run ___% ☐

Shading: Left Bank None 100 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense ___% ☐

Right Bank None 95 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 5 % ☐

Water Clarity Clear 10 % ☐ Cloudy 90 % ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 80 % ☐ Unstble ___% ☐ Soft 20 % ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) ☐

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

Very little channel vegetation. Algae abundant on cobbles in shallower areas but quite silted

Macrophyte Survey Form

River: Ure
Site name: 2, Jervaulx
Length: 500m
Scale used: (A) C (delete as appropriate)

NGR: SE 164861
Date: 8/7/98
Surveyor: PS/MG

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	3	2
Lemanea fluviatilis (A)	2	1
Vaucheria sp (B)	1	1
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg. (C)	2	1
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile (C)	1	1
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides (E)	1	1
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (D)	2	1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (A)	5	3
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp pseudofluitans (A)	1	1
Ran. penic. subsp penicillatus		
Ran. penic. subsp vertumnus		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris (A)	2	1
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton tricholdes		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Fissidens rufulus	B	2	1
Juncus articulatus		1	1
Phalaris arundinacea		1	1
Myosotis scorpioides		1	1
Agrostis stolonifera		1	1
Alnus glutinosa		1	1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 20% ☐ >20 80% ☐

Depth (m) <0.25 24% ☐ 0.25-0.5 65% ☐ >0.5-1 10% ☐ >1.0 1% ☐

Substrate Bedrock ___% ☐ Boulders 1% ☐ Cobbles 80% ☐ Pebbles 18% ☐ Gravel ___% ☐

Sand 1% ☐ Silt/Mud ___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool ___% ☐ Slack 2% ☐ Riffle 25% ☐ Run 73% ☐

Shading: Left Bank None 98% ☐ Slight ___% ☐ Mod. ___% ☐ Dense 2% ☐

Right Bank None 95% ☐ Slight ___% ☐ Mod. ___% ☐ Dense 5% ☐

Water Clarity Clear 100% ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm 20% ☐ Stable 80% ☐ Unstble ___% ☐ Soft ___% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites U/s 1b _____ **Comparability** B

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Ure
Site name: 2, Jervaulx
Length: 100 m
Scale used: A / (C) (delete as appropriate)

NGR: SE 164861
Date: 8/7/98
Surveyor: PS/MG

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		1
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg. (C)		2
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (D)		1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (A)		2
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans* (A)		1
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiformis		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris (A)		2
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton friesii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea			2
Myosotis scorpioides			1
Agrostis stolonifera			1
Juncus articulatus			1
Fissidens rufulus	F		1
Alnus glutinosa			2

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100% ☐

Depth (m) <0.25 15% ☐ 0.25-0.5 70% ☐ >0.5-1 15% ☐ >1.0 ___% ☐

Substrate Bedrock ___% ☐ Boulders 5% ☐ Cobbles 80% ☐ Pebbles 15% ☐ Gravel ___% ☐

Sand ___% ☐ Silt/Mud ___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool ___% ☐ Slack 5% ☐ Riffle ___% ☐ Run 95% ☐

Shading: Left Bank None 99% ☐ Slight ___% ☐ Mod. ___% ☐ Dense 1% ☐

Right Bank None 100% ☐ Slight ___% ☐ Mod. ___% ☐ Dense ___% ☐

Water Clarity Clear 100% ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 100% ☐ Unstble ___% ☐ Soft ___% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Use 1b — **Comparability** B

Sites ___ — **Comparability** ☐

Sites ___ — **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ ___

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	___
Algae	☐	___
Others	☐	___

Comments (including observations on plant condition, algal and epiphyte growth)

Centre of channel sparsely vegetated.
One stand of Eleocharis, other species scattered.

Macrophyte Survey Form

River: Ure
Site name: 26, dls Kilgram Bridge intake
Length: 500m
Scale used: (A) C (delete as appropriate)

NGR: SE 191860
Date: 8/7/98
Surveyor: PSIMG

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	3	3
Lemanea fluviatilis (B)	1	1
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg. (A)	3	3
LIVERWORTS		
Chiloscyphus polyanthos (A)	1	1
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides (D)	2	1
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (C)	3	3
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (A)	5	4
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans* (A)	3	3
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiformis		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton tricholdes		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE		
Fissidens crassipes	B	2	2
Thalerin arundinaceae		1	1
Pellia sp	B	1	1
Agrostis stolonifera		1	1
Rorippa sylvestris		1	1
Myosotis scorpioides		1	1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100% ☐

Depth (m) <0.25 18% ☐ 0.25-0.5 60% ☐ >0.5-1 20% ☐ >1.0 2% ☐

Substrate Bedrock ___% ☐ Boulders 10% ☐ Cobbles 70% ☐ Pebbles 15% ☐ Gravel ___% ☐

Sand 5% ☐ Silt/Mud ___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool 1% ☐ Slack 24% ☐ Riffle 5% ☐ Run 70% ☐

Shading: Left Bank None 90% ☐ Slight ___% ☐ Mod. ___% ☐ Dense 10% ☐

Right Bank None 95% ☐ Slight ___% ☐ Mod. ___% ☐ Dense 5% ☐

Water Clarity Clear 100% ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm 20% ☐ Stable 80% ☐ Unstble ___% ☐ Soft ___% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Ure 2 **Comparability** A

Sites Ure 1b **Comparability** C

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Ure
Site name: 26, d/s Kilgram Bridge intake
Length: 100 m
Scale used: A / C (delete as appropriate)

NGR: SE 191860
Date: 8/7/98
Surveyor: PS/MG

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		1
Lemanea fluviatilis (B)		1
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg. (A)		3
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides (D)		1
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (C)		4
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (A)		6
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans* (A)		2
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton friesii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Fissidens crassipes	B		2
Rorippa sylvestris			1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100% ☐

Depth (m) <0.25 20 % ☐ 0.25-0.5 70 % ☐ >0.5-1 10 % ☐ >1.0 ___% ☐

Substrate Bedrock ___% ☐ Boulders 32% ☐ Cobbles 60% ☐ Pebbles 5 % ☐ Gravel ___% ☐

Sand 3 % ☐ Silt/Mud ___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool ___% ☐ Slack 5 % ☐ Riffle 90 % ☐ Run 5 % ☐

Shading: Left Bank None 90 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 10 % ☐

Right Bank None 100 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense ___% ☐

Water Clarity Clear 100 % ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm 20 % ☐ Stable 80% ☐ Unstble ___% ☐ Soft ___% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Ure 2 **Comparability** B

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes		
Algae		
Others		

Comments (including observations on plant condition, algal and epiphyte growth)

Macrophyte Survey Form

River: Ure
Site name: 3, Clifton Castle
Length: 500m
Scale used: (A)/ C (delete as appropriate)

NGR: SE 222831
Date: 8/7/98
Surveyor: PS/MG

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	4	3
Lemanea fluviatilis (A)	2	1
Vaucheria sp (C)	2	1
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg. (B)	3	2
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (A)	3	2
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (B)	5	3
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans* (A)	1	1
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris (A)	1	1
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton frelsii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Fissidens rufulus	C	4	3
Rorippa sylvestris		1	1
Phalaris arundinacea		1	1
Petasites hybridus		1	1
Agrostis stolonifera		1	1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 20 % ☐ >20 80 % ☐

Depth (m) <0.25 5 % ☐ 0.25-0.5 10 % ☐ >0.5-1 60 % ☐ >1.0 25 % ☐

Substrate Bedrock 3 % ☐ Boulders 60 % ☐ Cobbles 20 % ☐ Pebbles 7 % ☐ Gravel 5 % ☐

Sand 2 % ☐ Silt/Mud 3 % ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool 5 % ☐ Slack 30 % ☐ Riffle 20 % ☐ Run 45 % ☐

Shading: Left Bank None 95 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 5 % ☐

Right Bank None 80 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 20 % ☐

Water Clarity Clear 100 % ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm 10 % ☐ Stable 90 % ☐ Unstble ___% ☐ Soft ___% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Ure 2 **Comparability** B

Sites Ure 2b **Comparability** B

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

Deeper, more shade than US sites.

Macrophyte Survey Form

River: Ure
Site name: 3, Clifton Castle
Length: 100m
Scale used: A / (C) (delete as appropriate)

NGR: SE 222831
Date: 8/7/98
Surveyor: PS / MG

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		2
Lemanea fluviatilis (A)		1
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (A)		1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (B)		1
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris (A)		1
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Rorippa sylvestris			1
Fissidens rufulus	C		1
Agrostis stolonifera			1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 100 % ☐ >20 ___% ☐

Depth (m) <0.25 10 % ☐ 0.25-0.5 10 % ☐ >0.5-1 20 % ☐ >1.0 60 % ☐

Substrate Bedrock 5 % ☐ Boulders 80 % ☐ Cobbles 10 % ☐ Pebbles ___% ☐ Gravel 3 % ☐

Sand 2 % ☐ Silt/Mud ___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool ___% ☐ Slack 100 % ☐ Riffle ___% ☐ Run ___% ☐

Shading: Left Bank None 100 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense ___% ☐

Right Bank None 80 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 20 % ☐

Water Clarity Clear 100% ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm 100 % ☐ Stable ___% ☐ Unstble ___% ☐ Soft ___% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Ure 2 **Comparability** C

Sites Ure 26 **Comparability** D

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) ☐

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Ure
Site name: 9, Aldwark
Length: 500m
Scale used: (A) / C (delete as appropriate)

NGR: SE 468629
Date: 7/7/98
Surveyor: MG/PS

	Rel	Cov		Rel	Cov		Rel	Cov
ALGAE			*Lotus pedunculatus*			*Lemna trisulca*		
Batrachospermum sp			*Menyanthes trifoliata*			*Phragmites australis*		
Hildenbrandia rivularis			*Montia fontana*			*Potamogeton alpinus*		
Lemanea fluviatillis			*Myriophyllum alterniflorum*			*Potamogeton berchtoldii*		
Vaucheria sp			*Myriophyllum spicatum*			*Potamogeton crispus*		
Enteromorpha sp			*Nuphar lutea*			*Potamogeton freisli*		
Stigeoclonium tenue			*Nymphaea alba*			*Potamogeton gramineus*		
Hydrodictyum reticulatum			*Nymphoides peltata*			*Potamogeton lucens*		
Cladophora agg.			*Oenanthe crocata*			*Potamogeton natans*		
LIVERWORTS			*Oenanthe fluviatilis*			*Potamogeton obtusifolius*		
Chiloscyphus polyanthos			*Polygonum amphibium*			*Potamogeton pectinatus*	5	3
Jungermania atrovirens			*Potentilla erecta*			*Potamogeton perfoliatus*		
Marsupella emarginata			*Ranunculus aquatilis*			*Potamogeton polygonifolius*		
Nardia compressa			*Ran. penic.* subsp *pseudofluitans*			*Potamogeton praelongus*		
Pellia endiviifolia			*Ran. penic.* subsp *penicillatus*			*Potamogeton pusillus*		
Pellia epiphylla			*Ran. penic.* subsp *vertumnus*			*Potamogeton tricholdes*		
Scapania undulata			*Ranunculus circinatus*			*Sagittaria sagittifolia*		
MOSSES			*Ranunculus flammula*			*Schoenoplectus lacustris*	2	1
Amblystegium fluviatile			*Ranunculus fluitans*			*Sparganium emersum*		
Amblystegium riparium			*Ranunculus hederaceus*			*Sparganium erectum*	3	2
Blindia acuta			*Ranunculus omiophyllus*			*Spirodela polyrhiza*		
Brachythecium plumosum			*Ranunculus peltatus*			*Typha latifolia*		
Brachythecium rivulare			*Ranunculus trichophyllus*			*Typha angustifolia*		
Brachythecium rutabulum			*Ranunculus sceleratus*			*Zannichellia palustris*		
Bryum pseudotriquetrum			*Rorippa amphibia*					
Calliergon cuspidatum			*Rorippa nasturtium-aquaticum*			OTHER SPECIES / SAMPLE		
Cinclidotus fontinaloides			*Rumex hydrolopathum*			Phalaris arundinacea	4	3
Dichodontium flavescens			*Veronica anagallis-aquatica*					
Dichodontium palustre			*Veronica catenata*					
Dicranella palustris			*Veronica scutellata*					
Fontinalis antipyretica			*Viola palustris*					
Fontinalis squamosa			MONOCOTYLEDONS					
Hygrohypnum luridum			*Acorus calamus*					
Hygrohypnum ochraceum			*Alisma plantago aquatica*					
Hyocomium armoricum			*Alisma lanceolatum*					
Philonotis fontana			*Bolboschoenus maritimus*					
Polytrichum commune			*Butomus umbellatus*	1	1			
Racomitrium aciculare			*Carex acuta*					
Rhynchostegium riparioides			*Carex acutiforms*					
Sphagnum species			*Carex riparia*					
Thamnobryum alopecurum			*Carex rostrata*					
VASCULAR CRYPTOGRAMS			*Carex vesicaria*					
Azolla filiculoides			*Catabrosa aquatica*					
Equisetum fluviatile			*Eleocharis palustris*					
Equisetum palustre			*Eleogiton fluitans*					
DICOTYLEDONS			*Elodea canadensis*					
Apium inundatum			*Elodea nuttallii*	1	1			
Apium nodiflorum			*Glyceria maxima*					
Berula erecta			*Groenlandia densa*					
Callitriche hamulata			*Hydrocharis morsus-ranae*					
Callitriche obtusangula			*Iris pseudacorus*					
Ceratophyllum demersum			*Juncus bulbosus*					
Hippurus vulgaris			*Lemna gibba*					
Littorella uniflora			*Lemna minor*					

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100% ☐

Depth (m) <0.25 2 % ☐ 0.25-0.5 2 % ☐ >0.5-1 2 % ☐ >1.0 94 % ☐

Substrate Bedrock ___% ☐ Boulders ___% ☐ Cobbles ___% ☐ Pebbles ___% ☐ Gravel ___% ☐

Sand 1 % ☐ Silt/Mud 5 % ☐ Clay ___% ☐ Peat ___% ☐ Not visible 94

Habitat Pool ___% ☐ Slack 100% ☐ Riffle ___% ☐ Run ___% ☐

Shading: Left Bank None 90% ☐ Slight ___% ☐ Mod. ___% ☐ Dense 10 % ☐

Right Bank None 97% ☐ Slight ___% ☐ Mod. ___% ☐ Dense 3 % ☐

Water Clarity Clear 10 % ☐ Cloudy 90 % ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable ___% ☐ Unstble 80% ☐ Soft 20 % ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) B

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

Giant Hogweed on banks
Grapnel used
Centre of channel unvegetated.

Macrophyte Survey Form

River: Ure
Site name: 9. Aldwark
Length: 100 m
Scale used: A / C (delete as appropriate)

NGR: SE 468629
Date: 7/7/98
Surveyor: MG/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *peniciliatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		2
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		1
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		S
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		3
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea			3

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100% ☐

Depth (m) <0.25 1 % ☐ 0.25-0.5 2 % ☐ >0.5-1 2 % ☐ >1.0 95 % ☐

Substrate Bedrock ___% ☐ Boulders ___% ☐ Cobbles ___% ☐ Pebbles ___% ☐ Gravel ___% ☐

Sand 2 % ☐ Silt/Mud 10 % ☐ Clay ___% ☐ Peat ___% ☐ Not visible 88

Habitat Pool ___% ☐ Slack 100 % ☐ Riffle ___% ☐ Run ___% ☐

Shading: Left Bank None 90 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 10 % ☐

Right Bank None 98 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 2 % ☐

Water Clarity Clear 10 % ☐ Cloudy 90 % ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable ___% ☐ Unstble 70 % ☐ Soft 30 % ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) ☐

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

Gravel used

Macrophyte Survey Form

River: Wharfe
Site name: 1, u/s Starbotton
Length: 500m
Scale used: (A) C (delete as appropriate)

NGR: SD 946756
Date: 12/7/98
Surveyor: PS/MG

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatilis (A)	1	1
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos (C)	2	1
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides (B)	1	1
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (C)	5	2
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (A)	4	1
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile	2	1
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp pseudofluitans		
Ran. penic. subsp penicillatus		
Ran. penic. subsp vertumnus		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiformis (C)	1	1
Carex riparia (B)	1	1
Carex rostrata (D)	2	1
Carex vesicaria (A)	1	1
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus	1	1
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton tricholdes		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Caltha palustris		1	1
Petasites hybridus		1	1
Phalaris arundinacea		1	1
Mentha aquatica		1	1
Agrostis stolonifera		1	1
Juncus articulatus		1	1
Rumex sp.		1	1
Jungermannia exsertifolia	A	1	1
Pellia sp	B	1	1
Juncus inflexus		1	1

%	C	A
<0.1%	1	1
0.1-1%	2	2
1-2.5%	3	3
2.5-5%	4	3
5-10%	5	4
10-25%	6	5
25-50%	7	5
50-75%	8	5
>75%	9	5

Area

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 30% ☐ >10-20 70% ☐ >20 ___% ☐

Depth (m) <0.25 12% ☐ 0.25-0.5 45% ☐ >0.5-1 40% ☐ >1.0 3% ☐

Substrate Bedrock ___% ☐ Boulders 2% ☐ Cobbles 10% ☐ Pebbles 70% ☐ Gravel 10% ☐

Sand 7% ☐ Silt/Mud ___% ☐ Clay 1% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool 3% ☐ Slack 60% ☐ Riffle 35% ☐ Run 2% ☐

Shading: Left Bank None 90% ☐ Slight ___% ☐ Mod. ___% ☐ Dense 10% ☐

Right Bank None 90% ☐ Slight ___% ☐ Mod. 2% ☐ Dense 8% ☐

Water Clarity Clear 100% ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 80% ☐ Unstble 15% ☐ Soft 5% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) ☐ A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	6	Liverwort A-C, Moss A-C
Algae	1	Lemanea fluviatilis (A)
Others		

Comments (including observations on plant condition, algal and epiphyte growth)

Submerged vegetation almost entirely bryophytes. Higher plants are mostly marginals.

Macrophyte Survey Form

River: Wharfe
Site name: 1, u/s Starbotton
Length: 100 m
Scale used: A / (C) (delete as appropriate)

NGR: SD 946 756
Date: 12/7/98
Surveyor: PS/MG

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos (C)		1
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (C)		2
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		1
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiformis		
Carex riparia		
Carex rostrata (D)		1
Carex vesicaria (A)		1
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton tricholdes		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Caltha palustris			1
Phalaris arundinacea			1
Juncus inflexus			1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 10 % ☐ >10-20 90 % ☐ >20 ___% ☐

Depth (m) <0.25 5 % ☐ 0.25-0.5 25 % ☐ >0.5-1 70 % ☐ >1.0 ___% ☐

Substrate Bedrock ___% ☐ Boulders 5 % ☐ Cobbles 5 % ☐ Pebbles 70 % ☐ Gravel 5 % ☐

Sand 10 % ☐ Silt/Mud ___% ☐ Clay 5 % ☐ Peat ___% ☐ Not visible ☐

Habitat Pool ___% ☐ Slack 90 % ☐ Riffle 10 % ☐ Run ___% ☐

Shading: Left Bank None 95 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 5 % ☐

Right Bank None 98 % ☐ Slight ___% ☐ Mod. 2 % ☐ Dense ___% ☐

Water Clarity Clear 100 % ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 80 % ☐ Unstble 10 % ☐ Soft 10 % ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Wharfe
Site name: 2, dls Conistone Bridge
Length: 500m
Scale used: (A) C (delete as appropriate)

NGR: SD 960672
Date: 12/7/98
Surveyor: PS/MG

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	1	1
Lemanea fluviatillis (A)	1	1
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg. (B)	1	1
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides (B)	5	3
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (A)	3	2
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (C)	5	3
Sphagnum species		
Thamnobryum alopecurum (E)	2	1
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton tricholdes		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea		1	1
Fissidens crassipes	D	2	1
Mentha aquatica		1	1
Rorippa sylvestris		1	1
Myosotis scorpioides		1	1
Rumex sp		1	1
Petasites hybridus		1	1
Agrostis stolonifera		1	1
Eleocharis sp		1	1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale. 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 2 % ☐ >10-20 96 % ☐ >20 2 % ☐

Depth (m) <0.25 20 % ☐ 0.25-0.5 72% ☐ >0.5-1 5 % ☐ >1.0 3 % ☐

Substrate Bedrock 1 % ☐ Boulders 3% ☐ Cobbles 70% ☐ Pebbles 10 % ☐ Gravel 10% ☐

Sand 6 % ☐ Silt/Mud ___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool 2 % ☐ Slack 85% ☐ Riffle 3 % ☐ Run 10 % ☐

Shading: Left Bank None 99 % ☐ Slight ___% ☐ Mod. 1 % ☐ Dense ___% ☐

Right Bank None 85 % ☐ Slight ___% ☐ Mod. 10 % ☐ Dense 5 % ☐

Water Clarity Clear 100 % ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm 1 % ☐ Stable 94 % ☐ Unstble 5% ☐ Soft ___% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Whaife 1 **Comparability** B

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical Impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

Mosses v. abundant in shaded margins - dense also on exposed BO - suggests fluctuating water levels.

Macrophyte Survey Form

River: Wharfe
Site name: 2. dls Conistone Bridge
Length: 100 m
Scale used: A / (C) (delete as appropriate)

NGR: SD 980 672
Date: 12/7/98
Surveyor: MG/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		1
Lemanea fluviatilis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg. (B)		1
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides (B)		2
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (A)		2
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (C)		2
Sphagnum species		
Thamnobryum alopecurum (E)		1
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton tricholdes		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Fissidens crassipes	D		1
Agrostis stolonifera			1
Rumex sp			1
Rorippa sylvestris			1
Mentha aquatica			1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 100 % ☐ >20 ___% ☐

Depth (m) <0.25 20 % ☐ 0.25-0.5 80 % ☐ >0.5-1 ___% ☐ >1.0 ___% ☐

Substrate Bedrock ___% ☐ Boulders 5 % ☐ Cobbles 80 % ☐ Pebbles 8 % ☐ Gravel 5 % ☐

Sand 2 % ☐ Silt/Mud ___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool ___% ☐ Slack 100 % ☐ Riffle ___% ☐ Run ___% ☐

Shading: Left Bank None 100 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense ___% ☐

Right Bank None 80 % ☐ Slight ___% ☐ Mod. 15 % ☐ Dense 5 % ☐

Water Clarity Clear 100 % ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 100 % ☐ Unstble ___% ☐ Soft ___% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Wharfe 1 **Comparability** B

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

Macrophyte Survey Form

River: Wharfe
Site name: 3, u/s Hebden
Length: 500m
Scale used: (A) / C (delete as appropriate)

NGR: SE 015626
Date: 12/7/98
Surveyor: PS/MG

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	1	1
Lemanea fluviatilis (C)	1	1
Vaucheria sp (B)	1	1
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.	1	1
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides (B)	1	1
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (D)	3	1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (A)	5	2
Sphagnum species		
Thamnobryum alopecurum (E)	1	1
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre	1	1
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis (A)	1	1
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus (A)	1	1
Potamogeton frelsii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton tricholdes		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea		2	1
Caltha palustris		1	1
Agrostis stolonifera		2	1
Fissidens rufulus	C	1	1
Rorippa sylvestris		1	1
Myosotis scorpioides		1	1
Cladophora aggregata/glomerata	A	1	1
Carex aquatilis	A	3	1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 10% ☐ >20 90% ☐

Depth (m) <0.25 20% ☐ 0.25-0.5 40% ☐ >0.5-1 37% ☐ >1.0 3% ☐

Substrate Bedrock ___% ☐ Boulders 3% ☐ Cobbles 40% ☐ Pebbles 40% ☐ Gravel 7% ☐

Sand 10% ☐ Silt/Mud ___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool ___% ☐ Slack 82% ☐ Riffle 15% ☐ Run 3% ☐

Shading: Left Bank None 90% ☐ Slight ___% ☐ Mod. 5% ☐ Dense 5% ☐

Right Bank None 99% ☐ Slight ___% ☐ Mod. ___% ☐ Dense 1% ☐

Water Clarity Clear 100% ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 75% ☐ Unstble 25% ☐ Soft ___% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Wharfe 1 **Comparability** B

Sites Wharfe 2 **Comparability** A

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

Large bed of Ranunculus which was recorded in the previous 2 years was completely absent. Mosses abundant on emergent boulders

Macrophyte Survey Form

River: Wharfe
Site name: 3 mls Hebden
Length: 100 m
Scale used: A / C (delete as appropriate)

NGR: SE 015626
Date: 12/7/98
Surveyor: PS/MG

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		1
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (D)		1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (A)		1
Sphagnum species		
Thamnobryum alopecurum (E)		1
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Agrostis stolonifera			1
Fissidens rufulus	C		1
Cladophora rivularis	A		1
Carex aquatilis	A		1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100 % ☐

Depth (m) <0.25 40 % ☐ 0.25-0.5 50 % ☐ >0.5-1 10 % ☐ >1.0 ___% ☐

Substrate Bedrock ___% ☐ Boulders 3 % ☐ Cobbles 40 % ☐ Pebbles 40 % ☐ Gravel 10 % ☐

Sand 7 % ☐ Silt/Mud ___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool ___% ☐ Slack 97 % ☐ Riffle ___% ☐ Run 3 % ☐

Shading: Left Bank None 85 % ☐ Slight ___% ☐ Mod. 5 % ☐ Dense 10 % ☐

Right Bank None 100 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense ___% ☐

Water Clarity Clear 100 % ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 50 % ☐ Unstble 50 % ☐ Soft ___% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Wharfe 2 **Comparability** A

Sites Wharfe 1 **Comparability** B

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

Macrophyte Survey Form

River: Wharfe
Site name: 4, Appletreewick
Length: 500m
Scale used: A / (C) (delete as appropriate)

NGR: SE 042602
Date: 13/7/98
Surveyor: MG/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis (B)	1	1
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides (B)	2	1
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (A)	3	2
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (C)	5	3
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre	1	1
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis (A)	2	1
Ran. penic. subsp pseudofluitans		
Ran. penic. subsp penicillatus		
Ran. penic. subsp vertumnus		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton tricholdes		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea		3	2
Agrostis stolonifera		1	1
Mentha aquatica		1	1
Rumex sp.		1	1
Myosotis sarpioides		1	1
Rorippa sylvestris		1	1
Caltha palustris		1	1
Juncus articulatus		1	1
Carex aquatilis	A	2	2
Mougeotia sp	A	1	1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100 % ☐

Depth (m) <0.25 5 % ☐ 0.25-0.5 40 % ☐ >0.5-1 50% ☐ >1.0 5 % ☐

Substrate Bedrock 1 % ☐ Boulders 60% ☐ Cobbles 10 % ☐ Pebbles 5 % ☐ Gravel 4% ☐

Sand ___% ☐ Silt/Mud ___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible 20

Habitat Pool ___% ☐ Slack 10% ☐ Riffle 70 % ☐ Run 20 % ☐

Shading: Left Bank None 95 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 5 % ☐

Right Bank None 95 % ☐ Slight ___% ☐ Mod. 2 % ☐ Dense 3 % ☐

Water Clarity Clear ___% ☐ Cloudy 100 % ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 100% ☐ Unstble ___% ☐ Soft ___% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Wharfe 3 **Comparability** A

Sites Wharfe 6 **Comparability** A

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) B

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

High flow and cloudy water due to recent rain
Grapnel used in parts

Macrophyte Survey Form

River: Wharfe
Site name: 4, Appletreewick
Length: 100m
Scale used: A (C) (delete as appropriate)

NGR: SE 042 602
Date: 13/7/98
Surveyor: PS/MG

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis (B)		1
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides (B)		2
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (C)		4
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		1
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp pseudofluitans		
Ran. penic. subsp penicillatus		
Ran. penic. subsp vertumnus		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiformis		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton frelsii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton tricholdes		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea			1
Caltha palustris			1
Mentha aquatica			1
Carex aquatilis	A		1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale. 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100 % ☐

Depth (m) <0.25 10 % ☐ 0.25-0.5 30 % ☐ >0.5-1 60 % ☐ >1.0 ___% ☐

Substrate Bedrock ___% ☐ Boulders 30% ☐ Cobbles 10 % ☐ Pebbles 5 % ☐ Gravel 5 % ☐

Sand ___% ☐ Silt/Mud ___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible 50

Habitat Pool ___% ☐ Slack ___% ☐ Riffle 70 % ☐ Run 30 % ☐

Shading: Left Bank None 90 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 10 % ☐

Right Bank None 92 % ☐ Slight ___% ☐ Mod. 5 % ☐ Dense 3 % ☐

Water Clarity Clear ___% ☐ Cloudy 100 % ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 100 % ☐ Unstble ___% ☐ Soft ___% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites wharfe 3 **Comparability** A

Sites wharfe 6 **Comparability** A

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) B

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Wharfe (Dibb)
Site name: 5, uls Dibbles Bridge
Length: 500m
Scale used: (A) C (delete as appropriate)

NGR: SE054637
Date: 13/7/98
Surveyor: MG/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis (B)	1	1
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos (B)	2	2
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata (A)	2	2
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (A)+(C)	5	5
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum (B)+(E)	5	5
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare (F)	1	1
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre	1	1
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiformis		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima	1	1
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Fissidens viridulus	D	1	1
Schistidium rivulare	G	1	1
Juncus effusus		2	2
Tribonema sp	A	3	3

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 100 % ☐ >10-20 ___% ☐ >20 ___% ☐

Depth (m) <0.25 80 % ☐ 0.25-0.5 19 % ☐ >0.5-1 1 % ☐ >1.0 ___% ☐

Substrate Bedrock ___% ☐ Boulders 70% ☐ Cobbles 20% ☐ Pebbles 5% ☐ Gravel 5% ☐

Sand ___% ☐ Silt/Mud ___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool 2 % ☐ Slack 17 % ☐ Riffle 1 % ☐ Run 80 % ☐

Shading: Left Bank None 100% ☐ Slight ___% ☐ Mod. ___% ☐ Dense ___% ☐

Right Bank None 90 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 10 % ☐

Water Clarity Clear 100% ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 100 % ☐ Unstble ___% ☐ Soft ___% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Wharfe 3 **Comparability** C

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

Water level controlled by outflow from reservoir. Apparently fluctuates regularly as masses + algae abundant on exposed boulders.

Macrophyte Survey Form

River: Wharfe (Dibh)
Site name: S, u/s Dibbler Bridge
Length: 100m
Scale used: A / (C) (delete as appropriate)

NGR: SE 054637
Date: 13/7/98
Surveyor: MG/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis (B)		1
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata (A)		1
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (A) + (C)		5
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum (B)(E)		6
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare (F)		1
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton tricholdes		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Tribonema sp	A		2
Fissidens viridulus	D		1
Schistidium rivulare	G		1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 100 % ☐ >10-20 ___% ☐ >20 ___% ☐

Depth (m) <0.25 90 % ☐ 0.25-0.5 10 % ☐ >0.5-1 ___% ☐ >1.0 ___% ☐

Substrate Bedrock ___% ☐ Boulders 50% ☐ Cobbles 30% ☐ Pebbles 10 % ☐ Gravel 10 % ☐

Sand ___% ☐ Silt/Mud ___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool ___% ☐ Slack 20 % ☐ Riffle ___% ☐ Run 80 % ☐

Shading: Left Bank None 100 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense ___% ☐

Right Bank None 100 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense ___% ☐

Water Clarity Clear 100 % ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 100% ☐ Unstble ___% ☐ Soft ___% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Wharfe 3 **Comparability** C

Sites _____ **Comparability** _____

Sites _____ **Comparability** _____

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Wharfe
Site name: 6, d/s Strid
Length: 500m
Scale used: (A) C (delete as appropriate)

NGR: SE 08055 51
Date: 11/7/98
Surveyor: MG/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	2	1
Lemanea fluviatilis (A)	1	1
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos (B)	1	1
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile (E)	1	1
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides (C)	1	1
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (A)	5	3
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp pseudofluitans		
Ran. penic. subsp penicillatus		
Ran. penic. subsp vertumnus		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolapathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE		
Phalaris arundinacea		1	1
Fissidens crassipes	B	2	1
Agrostis stolonifera		1	1
Caltha palustris		1	1
Mentha aquatica		1	1
Petasites hybridus		1	1
Pellia sp.		1	1
Cladophora glomerata/fracta	(B)	1	1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 __% ☐ 1-5 __% ☐ >5-10 __% ☐ >10-20 2 % ☐ >20 98 % ☐

Depth (m) <0.25 8 % ☐ 0.25-0.5 20 % ☐ >0.5-1 70 % ☐ >1.0 2 % ☐

Substrate Bedrock 3 % ☐ Boulders 15 % ☐ Cobbles 60 % ☐ Pebbles 4 % ☐ Gravel 4 % ☐

Sand 4 % ☐ Silt/Mud __% ☐ Clay __% ☐ Peat __% ☐ Not visible 10 ☐

Habitat Pool __% ☐ Slack 85 % ☐ Riffle 5 % ☐ Run 10 % ☐

Shading: Left Bank None 85 % ☐ Slight __% ☐ Mod. 5 % ☐ Dense 10 % ☐

Right Bank None 95 % ☐ Slight __% ☐ Mod. __% ☐ Dense 5 % ☐

Water Clarity Clear 100 % ☐ Cloudy __% ☐ Turbid __% ☐

Bed Stability Firm 3 % ☐ Stable 95 % ☐ Unstble 2 % ☐ Soft __% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Wharfe 7 **Comparability** B

Sites Wharfe 8 **Comparability** A

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

Largely unvegetated in central section
Moss dominates in rapid flow

Macrophyte Survey Form

River: Whaite
Site name: 6, d/s Strid
Length: 100m
Scale used: A / (C) (delete as appropriate)

NGR: SE 080551
Date: 11/7/98
Surveyor: MG/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		1
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos (R)		1
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Petlia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (D)		1
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp pseudofluitans		
Ran. penic. subsp penicillatus		
Ran. penic. subsp vertumnus		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiformis		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE		
Phalaris arundinacea			1
Pellia sp			1
Fissidens crassipes			1
Cladophora rupestris	B		1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100% ☐

Depth (m) <0.25 2 % ☐ 0.25-0.5 10 % ☐ >0.5-1 86 % ☐ >1.0 2 % ☐

Substrate Bedrock 2 % ☐ Boulders 70% ☐ Cobbles 10 % ☐ Pebbles 8 % ☐ Gravel 5 % ☐

Sand 5 % ☐ Silt/Mud ___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool ___% ☐ Slack 90 % ☐ Riffle ___% ☐ Run 10 % ☐

Shading: Left Bank None 80 % ☐ Slight ___% ☐ Mod. 5 % ☐ Dense 15 % ☐

Right Bank None 77 % ☐ Slight ___% ☐ Mod. 5 % ☐ Dense 18 % ☐

Water Clarity Clear 100 % ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 100% ☐ Unstble ___% ☐ Soft ___% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Whwfe 7 — Comparability B

Sites Whwfe 8 — Comparability B

Sites _____ — Comparability _____

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

Macrophyte Survey Form

River: Wharfe
Site name: 7, u/s Lobwood
Length: 500m
Scale used: (A) C (delete as appropriate)

NGR: SE 072523
Date: 11/7/98
Surveyor: PS / MG

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	2	1
Lemanea fluviatilis (A)	1	1
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides (C)	1	1
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (B)	1	1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		-
Rhynchostegium riparioides (A)	4	2
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiformis		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris (A)	1	1
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Myosotis scorpioides		1	1
Mentha aquatica		1	1
Phalaris arundinacea		5	2
Caltha palustris		1	1
Petasites hybridus		1	1
Epilobium hirsutum		1	1
Juncus articulatus		1	1
Cladophora agg. (B)		2	1
Cyperus longus (A)		1	1
Carex hirta (A)		1	1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100% ☐

Depth (m) <0.25 30 % ☐ 0.25-0.5 50% ☐ >0.5-1 25 % ☐ >1.0 5 % ☐

Substrate Bedrock 1 % ☐ Boulders 1 % ☐ Cobbles 50% ☐ Pebbles 30 % ☐ Gravel 5 % ☐

Sand 8 % ☐ Silt/Mud ___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐ S

Habitat Pool ___% ☐ Slack 20 % ☐ Riffle 10 % ☐ Run 70 % ☐

Shading: Left Bank None 99 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 1 % ☐

Right Bank None 96% ☐ Slight ___% ☐ Mod. 2 % ☐ Dense 2 % ☐

Water Clarity Clear 100 % ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm 1 % ☐ Stable 85 % ☐ Unstble 6 % ☐ Soft 8 % ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Wharfe 8 — Comparability A

Sites Wharfe 7 — Comparability A

Sites _____ — Comparability ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes		
Algae		
Others		

Comments (including observations on plant condition, algal and epiphyte growth)

Sandy substrate, slower flow at d/s end
Sparse channel vegetation

Macrophyte Survey Form

River: Wharfe
Site name: 7, u/s Lobwood
Length: 100 m
Scale used: A (C) (delete as appropriate)

NGR: SE 072523
Date: 11/7/98
Surveyor: PS | MG

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		1
Lemanea fluviatillis (A)		1
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides (C)		1
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (B)		1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (A)		2
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *peniciliatus*		
Ran. penic. subsp *verturnnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris (A)		1
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Mentha aquatica			1
Phalaris arundinacea			2
Petasites hybridus			1
Calystegia sepium	B		1

%	C	A
<0.1%	1	1
0.1-1%	2	2
1-2.5%	3	3
2.5-5%	4	3
5-10%	5	4
10-25%	6	5
25-50%	7	5
50-75%	8	5
>75%	9	5

Area

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100 % ☐

Depth (m) <0.25 20 % ☐ 0.25-0.5 80 % ☐ >0.5-1 ___% ☐ >1.0 ___% ☐

Substrate Bedrock ___% ☐ Boulders 2 % ☐ Cobbles 80% ☐ Pebbles 6 % ☐ Gravel 6 % ☐

Sand 6 % ☐ Silt/Mud ___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool 2 % ☐ Slack 3 % ☐ Riffle ___% ☐ Run 95 % ☐

Shading: Left Bank None 99 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 1 % ☐

Right Bank None 100 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense ___% ☐

Water Clarity Clear 100 % ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 100 % ☐ Unstble ___% ☐ Soft ___% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Wharfe 8 **Comparability** A

Sites Wharfe 9 **Comparability** B

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes		
Algae		
Others		

Comments (including observations on plant condition, algal and epiphyte growth)

Macrophyte Survey Form

River: Wharfe
Site name: 8, Addingham (d/s weir)
Length: 500 m
Scale used: (A) C (delete as appropriate)

NGR:
Date: 11/7/98
Surveyor: MG/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	2	1
Lemanea fluviatillis (A)	1	1
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endivilifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides (B)	1	1
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (A)	5	3
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus	1	1
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea		3	1
Petasites hybridus		1	1
Mentha aquatica		1	1
Myosotis scorpioides		1	1
Oedogonium sp	C	1	1
Cladophora agg.	B	1	1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 10 % ☐ >20 90 % ☐

Depth (m) <0.25 10 % ☐ 0.25-0.5 20 % ☐ >0.5-1 60 % ☐ >1.0 10 % ☐

Substrate Bedrock ___% ☐ Boulders 15% ☐ Cobbles 50% ☐ Pebbles 3 % ☐ Gravel 2 % ☐

Sand 10 % ☐ Silt/Mud ___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible 20

Habitat Pool ___% ☐ Slack 20% ☐ Riffle 20 % ☐ Run 60 % ☐

Shading: Left Bank None 85 % ☐ Slight ___% ☐ Mod. 5 % ☐ Dense 10 % ☐

Right Bank None 92 % ☐ Slight ___% ☐ Mod. 3 % ☐ Dense 5 % ☐

Water Clarity Clear 90 % ☐ Cloudy 10 % ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 100 % ☐ Unstble ___% ☐ Soft ___% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Wharfe 9 — Comparability A

Sites Wharfe 10 — Comparability B

Sites ___ — Comparability ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ ___

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4):
Bryophytes		
Algae		
Others		

Comments (including observations on plant condition, algal and epiphyte growth)

Few species, dominated by bryophytes in fast flow

Macrophyte Survey Form

River: Wharfe
Site name: 8, Addingham (dls Weir)
Length: 100m
Scale used: A / (C) (delete as appropriate)

NGR: SE 091489
Date: 11/7/98
Surveyor: MG/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		1
Lemanea fluviatilis (A)		1
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (A)		4
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiformis		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Petasites hybridus			1
Phalaris arundinacea			1
Oedogonium sp	C		1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100 % ☐

Depth (m) <0.25 25 % ☐ 0.25-0.5 50 % ☐ >0.5-1 25 % ☐ >1.0 ___% ☐

Substrate Bedrock ___% ☐ Boulders 5 % ☐ Cobbles 60 % ☐ Pebbles 15 % ☐ Gravel 10 % ☐

Sand 10 % ☐ Silt/Mud ___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool ___% ☐ Slack 20 % ☐ Riffle 30 % ☐ Run 50 % ☐

Shading: Left Bank None 90 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 10 % ☐

Right Bank None 90 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 10 % ☐

Water Clarity Clear 100 % ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 100 % ☐ Unstble ___% ☐ Soft ___% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Whorfe 9 **Comparability** B

Sites Whorfe 10 **Comparability** B

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes		
Algae		
Others		

Comments (including observations on plant condition, algal and epiphyte growth)

Macrophyte Survey Form

River: Wharfe
Site name: 9, Ilkley
Length: 500m
Scale used: (A) C (delete as appropriate)

NGR: SE 124484
Date: 11/7/98
Surveyor: MG/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	4	1
Lemanea fluviatillis (B)	1	1
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphyta		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides (B)	1	1
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (C)	3	1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (A)	5	2
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *peniciliatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiformis		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Petasites hybridus		1	1
Fissidens rufulus		1	1
Phalaris arundinacea		1	1
Myosotis scorpioides		1	1
Agrostis stolonifera		1	1
Cladophora aggregata	A	5	2

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale. 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100 % ☐

Depth (m) <0.25 5 % ☐ 0.25-0.5 15 % ☐ >0.5-1 70 % ☐ >1.0 10 % ☐

Substrate Bedrock ___% ☐ Boulders 7% ☐ Cobbles 50% ☐ Pebbles 10 % ☐ Gravel 5 % ☐

Sand 5 % ☐ Silt/Mud 3 % ☐ Clay ___% ☐ Peat ___% ☐ Not visible 20

Habitat Pool ___% ☐ Slack 80 % ☐ Riffle 10 % ☐ Run 10 % ☐

Shading: Left Bank None 80 % ☐ Slight ___% ☐ Mod. 5 % ☐ Dense 15 % ☐

Right Bank None 80 % ☐ Slight ___% ☐ Mod. 5 % ☐ Dense 15 % ☐

Water Clarity Clear 80 % ☐ Cloudy 20 % ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 72 % ☐ Unstble 5% ☐ Soft 3 % ☐ 20% NV

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Wharfe 10 — Comparability B

Sites Wharfe 11 — Comparability A

Sites ___ — Comparability ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ ___

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	___
Algae	☐	___
Others	☐	___

Comments (including observations on plant condition, algal and epiphyte growth)

Little in channel vegetation. Mosses confined to u/s 100m. Cloudy after sewage outlet.

Macrophyte Survey Form

River: Wharfe
Site name: 9, Ilkley
Length: 100m
Scale used: A / (C) (delete as appropriate)

NGR: SE 124484
Date: 11/7/98
Surveyor: PS/MG

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		1
Lemanea fluviatilis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg. (A)		1
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (C)		1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiformis		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinaceae			1
Myosotis scorpioides			1
Agrostis stolonifera			1
Cladophora agg. glomerata	A		

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100 % ☐

Depth (m) <0.25 1 % ☐ 0.25-0.5 14 % ☐ >0.5-1 70 % ☐ >1.0 15 % ☐

Substrate Bedrock ___% ☐ Boulders ___% ☐ Cobbles 70% ☐ Pebbles 10 % ☐ Gravel 10% ☐

Sand 10 % ☐ Silt/Mud ___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool ___% ☐ Slack 100 % ☐ Riffle ___% ☐ Run ___% ☐

Shading: Left Bank None 80 % ☐ Slight ___% ☐ Mod. 5 % ☐ Dense 15 % ☐

Right Bank None 80 % ☐ Slight ___% ☐ Mod. 5 % ☐ Dense 15 % ☐

Water Clarity Clear 90 % ☐ Cloudy 10 % ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 95 % ☐ Unstble 5 % ☐ Soft ___% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Wharfe 10 — Comparability B

Sites Wharfe 11 — Comparability B

Sites _____ — Comparability ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

Graphel used in deeper areas.
Very little channel vegetation.

Macrophyte Survey Form

River: Wharfe
Site name: 10, d/s Burley
Length: 500m
Scale used: (A) C (delete as appropriate)

NGR: SE 175463
Date: 11/7/98
Surveyor: MG/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	1	1
Lemanea fluviatillis (C)	1	1
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg. (A)	5	3
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (A)	1	1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (B)	4	2
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum	2	1
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis (A)	1	1
Ran. penic. subsp *pseudofluitans* (B)	2	2
Ran. penic. subsp *peniciliatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolapathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiformis		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris	1	1
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii	1	1
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii (D)	1	1
Potamogeton crispus (C)	1	1
Potamogeton friesii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus (A)	1	1
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Mentha aquatica		1	1
Phalaris arundinacea		3	2
Agrostis stolonifera		1	1
Fissidens rufulus	C	1	1
Myosotis scorpioides		1	1
Rorippa sylvestris		1	1
Potamogeton x cooperi	B	2	2
Cladophora aegagropila	B	3	2

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100% ☐

Depth (m) <0.25 17% ☐ 0.25-0.5 40% ☐ >0.5-1 40% ☐ >1.0 3% ☐

Substrate Bedrock ___% ☐ Boulders 1% ☐ Cobbles 50% ☐ Pebbles 20% ☐ Gravel 10% ☐

Sand 15% ☐ Silt/Mud ___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible 4

Habitat Pool ___% ☐ Slack 83% ☐ Riffle 2% ☐ Run 15% ☐

Shading: Left Bank None 94% ☐ Slight ___% ☐ Mod. 3% ☐ Dense 3% ☐

Right Bank None 100% ☐ Slight ___% ☐ Mod. ___% ☐ Dense ___% ☐

Water Clarity Clear 90% ☐ Cloudy 10% ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 100% ☐ Unstble ___% ☐ Soft ___% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Wharfe 11 — Comparability B

Sites Wharfe 12 — Comparability A

Sites ___ — Comparability ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ ___

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	___
Algae	☐	___
Others	☐	___

Comments (including observations on plant condition, algal and epiphyte growth)

Moss dominates in fast flow

Water level appears slightly low - exposed Fontinalis antipyretica, algae etc.

Macrophyte Survey Form

River: Wharfe
Site name: 10 dls Burley
Length: 100 m
Scale used: A / (C) (delete as appropriate)

NGR: SE 175463
Date: 11/7/98
Surveyor: MG/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		2
Lemanea fluviatillis (C)		1
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg. (A)		1
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endivilfolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (A)		1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (B)		3
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		2
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis (A)		2
Ran. penic. subsp *pseudofluitans* (B)		2
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolapathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiformis		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		1
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea			2
Fissidens cristulus	C		1
Myosotis scorpioides			1
Potamogeton x cooperi	✓		1
Cladophora aegagropila	B		2

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale. 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100 % ☐

Depth (m) <0.25 20 % ☐ 0.25-0.5 50 % ☐ >0.5-1 30 % ☐ >1.0 ___% ☐

Substrate Bedrock ___% ☐ Boulders ___% ☐ Cobbles 50 % ☐ Pebbles 35 % ☐ Gravel 5 % ☐

Sand 10 % ☐ Silt/Mud ___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool ___% ☐ Slack 80 % ☐ Riffle 20 % ☐ Run ___% ☐

Shading: Left Bank None 97 % ☐ Slight ___% ☐ Mod. 3 % ☐ Dense ___% ☐

Right Bank None 100 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense ___% ☐

Water Clarity Clear 100 % ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 100 % ☐ Unstble ___% ☐ Soft ___% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites	Wharfe 11	Comparability B
Sites	Wharfe 12	Comparability A
Sites		Comparability

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

Macrophyte Survey Form

River: Wharfe
Site name: 11, Knotford
Length: 500m
Scale used: (A) C (delete as appropriate)

NGR: SE 223463
Date: 9/8/98
Surveyor: PSI MG

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	1	1
Lemanea fluviatilis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (B)	1	1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (A)	1	1
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum	5	1
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *peniciliatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiformis		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum	3	1
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Myosotis scorpioides		2	1
Phalaris arundinacea		2	1
Bunilleria sp	A	1	1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100 % ☐

Depth (m) <0.25 ___% ☐ 0.25-0.5 1 % ☐ >0.5-1 1 % ☐ >1.0 98 % ☐

Substrate Bedrock ___% ☐ Boulders 2 % ☐ Cobbles 2 % ☐ Pebbles ___% ☐ Gravel ___% ☐

Sand ___% ☐ Silt/Mud 5 % ☐ Clay ___% ☐ Peat ___% ☐ Not visible 91

Habitat Pool ___% ☐ Slack 100 % ☐ Riffle ___% ☐ Run ___% ☐

Shading: Left Bank None 95 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 5 % ☐

Right Bank None 85 % ☐ Slight ___% ☐ Mod. 5 % ☐ Dense 10 % ☐

Water Clarity Clear ___% ☐ Cloudy 100 % ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable ___% ☐ Unstble ___% ☐ Soft ___% ☐ Unknown

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) ☐ C

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

Graphel

Very little channel vegetation, much less than last year.

Macrophyte Survey Form

River: Wharfe
Site name: 11, Knotford
Length: 100 m
Scale used: A / (C) (delete as appropriate)

NGR: SE 223463
Date: 9/8/98
Surveyor: PS / MG

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatilis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endivilfolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		1
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *peniciliatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiformis		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea			1
Myosotis scorpioides			1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100 % ☐

Depth (m) <0.25 ___% ☐ 0.25-0.5 1 % ☐ >0.5-1 1 % ☐ >1.0 98 % ☐

Substrate Bedrock___% ☐ Boulders___% ☐ Cobbles___% ☐ Pebbles___% ☐ Gravel___% ☐

Sand 2 % ☐ Silt/Mud___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible 98

Habitat Pool ___% ☐ Slack 100 % ☐ Riffle ___% ☐ Run ___% ☐

Shading: Left Bank None 95 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 5 % ☐

Right Bank None 85 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 15 % ☐

Water Clarity Clear ___% ☐ Cloudy 100 % ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable ___% ☐ Unstble___% ☐ Soft ___% ☐ Unknown

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) ☐ C

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

Very little channel vegetation

Macrophyte Survey Form

River: Wharfe
Site name: 12, u/s Riffa Beck
Length: 500m
Scale used: (A) C (delete as appropriate)

NGR: SE 255456
Date: 10/7/98
Surveyor: MG/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	1	2
Lemanea fluviatilis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg. (A)	5	5
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (B)	1	1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (A)	1	1
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum	2	2
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis (B)	1	1
Ran. penic. subsp *pseudofluitans* (A)	1	1
Ran. penic. subsp *peniciliatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii	1	1
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor	1	1

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus (A)	3	3
Potamogeton perfoliatus (B)	2	2
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea		2	3
Petasites hybridus		1	1
Rorippa sylvestris		1	1
Veronica beccabunga		1	1
Solanum dulcamara		1	1
Cladophora agg. epiphyte	B	2	2

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100% ☐

Depth (m) <0.25 20% ☐ 0.25-0.5 40% ☐ >0.5-1 40% ☐ >1.0 ___% ☐

Substrate Bedrock ___% ☐ Boulders 2% ☐ Cobbles 5% ☐ Pebbles 20% ☐ Gravel 11% ☐
Sand 15% ☐ Silt/Mud 2% ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool ___% ☐ Slack 95% ☐ Riffle 3% ☐ Run 2% ☐

Shading: Left Bank None 99% ☐ Slight ___% ☐ Mod. 1% ☐ Dense ___% ☐
Right Bank None 96% ☐ Slight ___% ☐ Mod. ___% ☐ Dense 4% ☐

Water Clarity Clear 100% ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 98% ☐ Unstble ___% ☐ Soft 2% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites	Wharfe 13	**Comparability** A
Sites	Wharfe 14	**Comparability** B
Sites		**Comparability**

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes		
Algae		
Others		

Comments (including observations on plant condition, algal and epiphyte growth)
Diatom and filamentous algae smothering plants. Ranunculus and potamogeton at d/s end in poor condition

Macrophyte Survey Form

River: Wharfe
Site name: 12, u/s Riffa Beck
Length: 100m
Scale used: A / (C) (delete as appropriate)

NGR: SE 255456
Date: 10/7/98
Surveyor: MG IPS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		1
Lemanea fluviatilis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg. (A)		9
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (B)		1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		2
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiformis		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus (A)		2
Potamogeton perfoliatus (B)		2
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea			2

%	C	A
<0.1%	1	1
0.1-1%	2	2
1-2.5%	3	3
2.5-5%	4	3
5-10%	5	4
10-25%	6	5
25-50%	7	5
50-75%	8	5
>75%	9	5

Area

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100% ☐

Depth (m) <0.25 20% ☐ 0.25-0.5 40% ☐ >0.5-1 40% ☐ >1.0 ___% ☐

Substrate Bedrock ___% ☐ Boulders ___% ☐ Cobbles 10% ☐ Pebbles 40% ☐ Gravel 10% ☐

Sand 10% ☐ Silt/Mud ___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool ___% ☐ Slack 100% ☐ Riffle ___% ☐ Run ___% ☐

Shading: Left Bank None 99% ☐ Slight ___% ☐ Mod. 1% ☐ Dense ___% ☐

Right Bank None 98% ☐ Slight ___% ☐ Mod. ___% ☐ Dense 2% ☐

Water Clarity Clear 100% ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 100% ☐ Unstble ___% ☐ Soft ___% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Wharfe 13 — Comparability A

Sites Wharfe 14 — Comparability B

Sites ___ — Comparability ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ ___

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	___
Algae	☐	___
Others	☐	___

Comments (including observations on plant condition, algal and epiphyte growth)

Macrophyte Survey Form

River: Wharfe
Site name: 13, The Nunnery
Length: 500m
Scale used: (A) / C (delete as appropriate)

NGR: SE 288455
Date: 10/7/98
Surveyor: MG/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	3	3
Lemanea fluviatilis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg. (A)	2	2
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (A)	1	1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (B)	1	1
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum	3	2
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis (A)	2	2
Ran. penic. subsp pseudofluitans (B)	2	2
Ran. penic. subsp peniciliatus		
Ran. penic. subsp vertumnus		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiformis		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus (C)	1	1
Potamogeton friesii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus (B)	5	4
Potamogeton perfoliatus (A)	3	2
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum	1	1
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Fissidens rufulus		1	1
Rorippa sylvestris		1	1
Phalaris arundinacea		2	2
Agrostis stolonifera		1	1
Epilobium hirsutum		1	1
Petasites hybridus		1	1
Cladophora aggregata	B	1	1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100% ☐

Depth (m) <0.25 10% ☐ 0.25-0.5 80% ☐ >0.5-1 7% ☐ >1.0 3% ☐

Substrate Bedrock ___% ☐ Boulders 1% ☐ Cobbles 69% ☐ Pebbles 20% ☐ Gravel 2% ☐
Sand 7% ☐ Silt/Mud 1% ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool ___% ☐ Slack 5% ☐ Riffle 5% ☐ Run 90% ☐

Shading: Left Bank None 95% ☐ Slight ___% ☐ Mod. ___% ☐ Dense 5% ☐
Right Bank None 100% ☐ Slight ___% ☐ Mod. ___% ☐ Dense ___% ☐

Water Clarity Clear 100% ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 97% ☐ Unstble ___% ☐ Soft 3% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Whafe 14 — Comparability B
Sites Whafe 16 — Comparability B
Sites ___ — Comparability ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ ___

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	___
Algae	☐	___
Others	☐	___

Comments (including observations on plant condition, algal and epiphyte growth)

Very abundant plants
Good growth of Potamogeton pectinatus
Epiphytic algae in slower flows

Macrophyte Survey Form

River: Wharfe
Site name: 13, The Nursery
Length: 100m
Scale used: A / (C) (delete as appropriate)

NGR: SE 288455
Date: 10/7/98
Surveyor: MG/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		S
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg. (A)		3
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (A)		1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (B)		1
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		4
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis (A)		2
Ran. penic. subsp *pseudofluitans* (B)		2
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiformis		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus (B)		6
Potamogeton perfoliatus (A)		2
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea			1
Agrostis stolonifera			1
Epilobium hirsutum			1
Cladophora aegagropila	B		1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100% ☐

Depth (m) <0.25 10 % ☐ 0.25-0.5 90% ☐ >0.5-1 ___% ☐ >1.0 ___% ☐

Substrate Bedrock ___% ☐ Boulders ___% ☐ Cobbles 70% ☐ Pebbles 20 % ☐ Gravel 2% ☐

Sand 8 % ☐ Silt/Mud ___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool ___% ☐ Slack 10 % ☐ Riffle ___% ☐ Run 90 % ☐

Shading: Left Bank None 97% ☐ Slight ___% ☐ Mod. ___% ☐ Dense 3 % ☐

Right Bank None 100 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense ___% ☐

Water Clarity Clear 100 % ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 100 % ☐ Unstble ___% ☐ Soft ___% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites	Whorfe 16	Comparability	B
Sites	Whorfe 14	Comparability	B
Sites		Comparability	

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes		
Algae		
Others		

Comments (including observations on plant condition, algal and epiphyte growth)

Macrophyte Survey Form

River: Wharfe
Site name: 14, u/s Collingham
Length: 500m
Scale used: (A) / C (delete as appropriate)

NGR: SE 354457
Date: 10/7/98
Surveyor: PS/MG

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	2	1
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg. (A)	5	3
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (A)	1	1
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum	4	2
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans* (A)	2	1
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus ornlophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii	2	1
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus (A)	1	1
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus (B)	2	1
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum	1	1
Spirodela polyrhiza		
Typha latifolia	1	1
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea		3	2
Rorippa sylvestris		1	1
Juncus articulatus		1	1
Salix sp		1	1
Cladophora agg. epiphyte	B	1	1
Potamogeton x cooperi	C	1	1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 10% ☐ >20 90% ☐

Depth (m) <0.25 10% ☐ 0.25-0.5 20% ☐ >0.5-1 60% ☐ >1.0 10% ☐

Substrate Bedrock ___% ☐ Boulders 2% ☐ Cobbles 3% ☐ Pebbles 50% ☐ Gravel 10% ☐

Sand 5% ☐ Silt/Mud 10% ☐ Clay ___% ☐ Peat ___% ☐ Not visible 20

Habitat Pool 5% ☐ Slack 60% ☐ Riffle 25% ☐ Run 10% ☐

Shading: Left Bank None 85% ☐ Slight ___% ☐ Mod. 5% ☐ Dense 10% ☐

Right Bank None 80% ☐ Slight ___% ☐ Mod. 5% ☐ Dense 15% ☐

Water Clarity Clear 80% ☐ Cloudy 20% ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 15% ☐ Unstble 60% ☐ Soft 5% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Wharfe 16 **Comparability** C

Sites Wharfe 15 **Comparability** B

Sites _____ **Comparability** _____

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

Macrophyte Survey Form

River: Wharfe
Site name: 14, u/s Collingham
Length: 100m
Scale used: A / (C) (delete as appropriate)

NGR: SE 354457
Date: 10/7/98
Surveyor: MG / PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		1
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg. A		2
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		2
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans* (A)		1
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		2
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus (A)		1
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus (B)		1
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		1
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Rorippa sylvestris			1
Juncus articulatus			1
Salix sp			2
Phalaris arundinacea			1
Cladophora aquarophila	B		1
Potamogeton x cooperi	C		1

%	C	A
<0.1%	1	1
0.1-1%	2	2
1-2.5%	3	3
2.5-5%	4	3
5-10%	5	4
10-25%	6	5
25-50%	7	5
50-75%	8	5
>75%	9	5

Area

Physical Records River: NGR:

(Use 3 point scale. 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 30 % ☐ >20 70 % ☐

Depth (m) <0.25 15 % ☐ 0.25-0.5 20 % ☐ >0.5-1 60 % ☐ >1.0 5 % ☐

Substrate Bedrock ___% ☐ Boulders 5 % ☐ Cobbles 5 % ☐ Pebbles 50 % ☐ Gravel 20 % ☐

Sand 10 % ☐ Silt/Mud 10 % ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool 5 % ☐ Slack 65 % ☐ Riffle 10 % ☐ Run 20 % ☐

Shading: Left Bank None 95 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 5 % ☐

Right Bank None 85 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 15 % ☐

Water Clarity Clear 90 % ☐ Cloudy 10 % ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 40 % ☐ Unstble 50 % ☐ Soft 10 % ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Wharfe 16 **Comparability** C

Sites Wharfe 15 **Comparability** B

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

Potamogeton in in pooled / backwater area.

Macrophyte Survey Form

River: Wharfe
Site name: 16, u/s Woodhall Hotel
Length: 500m
Scale used: (A) / C (delete as appropriate)

NGR: SE 369467
Date: 10/7/98
Surveyor: MG/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	5	3
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg. (A)	2	2
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides (C)	1	1
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (B)	2	1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (A)	1	1
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum	3	2
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans* (A)	3	2
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiformis		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor	1	1

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus	1	1
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton tricholdes		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea		2	2
Fissidens rufulus		1	1
Rorippa sylvestris		1	1
Cladophora aegagropila	B	1	1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale. 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 3 % ☐ >20 97 % ☐

Depth (m) <0.25 10 % ☐ 0.25-0.5 20 % ☐ >0.5-1 65 % ☐ >1.0 5 % ☐

Substrate Bedrock ___% ☐ Boulders 2 % ☐ Cobbles 8 % ☐ Pebbles 60 % ☐ Gravel 20 % ☐

Sand 5 % ☐ Silt/Mud 5 % ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool ___% ☐ Slack 95 % ☐ Riffle ___% ☐ Run 5 % ☐

Shading: Left Bank None 85 % ☐ Slight ___% ☐ Mod. 5 % ☐ Dense 10 % ☐

Right Bank None 95 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 5 % ☐

Water Clarity Clear 100 % ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 15 % ☐ Unstble 80 % ☐ Soft 5 % ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Wharfe 15 — Comparability B

Sites Wharfe 17 — Comparability B

Sites ___ — Comparability ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ ___

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes		
Algae		
Others		

Comments (including observations on plant condition, algal and epiphyte growth)

Myriophyllum at edges with some silt / diatom deposition.
Hildenbrandia dominant on cobbles and pebbles.

Macrophyte Survey Form

River: Wharfe
Site name: 16. u/s Woodhall Hotel
Length: 100m
Scale used: A / (C) (delete as appropriate)

NGR: SE369467
Date: 10/7/98
Surveyor: MG/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		1
Lemanea fluviatilis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (B)		1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata	1	5
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		2
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp pseudofluitans		
Ran. penic. subsp peniciliatus		
Ran. penic. subsp vertumnus		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		-
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		1

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea			1
Rorippa sylvestris			1

%	C	A
<0.1%	1	1
0.1-1%	2	2
1-2.5%	3	3
2.5-5%	4	3
5-10%	5	4
10-25%	6	5
25-50%	7	5
50-75%	8	5
>75%	9	5

Area

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100% ☐

Depth (m) <0.25 30 % ☐ 0.25-0.5 50% ☐ >0.5-1 20 % ☐ >1.0 ___% ☐

Substrate Bedrock ___% ☐ Boulders 5 % ☐ Cobbles 10% ☐ Pebbles 60 % ☐ Gravel 20% ☐

Sand 5 % ☐ Silt/Mud ___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool ___% ☐ Slack 90 % ☐ Riffle ___% ☐ Run 10 % ☐

Shading: Left Bank None 80 % ☐ Slight ___% ☐ Mod. 5 % ☐ Dense 15 % ☐

Right Bank None 90 % ☐ Slight ___% ☐ Mod. 5 % ☐ Dense 5 % ☐

Water Clarity Clear 100 % ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 10 % ☐ Unstble 90% ☐ Soft ___% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Wharfe 15 Comparability B

Sites Wharfe 17 Comparability B

Sites ___ Comparability ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ ___

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes		
Algae		
Others		

Comments (including observations on plant condition, algal and epiphyte growth)

Almost no channel vegetation, only some marginal vegetation

Macrophyte Survey Form

River: Wharfe
Site name: 15, Boston Spa
Length: 500m
Scale used: (A) C (delete as appropriate)

NGR: SE 423465
Date: 9/7/98
Surveyor: PSI MG

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatilis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg. (A)	5	3
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides (A)	1	1
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum	2	2
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium	1	1
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp pseudofluitans (A)	1	1
Ran. penic. subsp penicillatus		
Ran. penic. subsp vertumnus		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolapathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica	1	1
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiformis		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis (A)	1	1
Elodea nuttallii (B)	4	3
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii (B)	1	1
Potamogeton crispus (A)	1	1
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus (C)	1	1
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia	1	1
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum	3	2
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Myosotis scorpioides		1	1
Phalaris arundinacea		1	1
Agrostis stolonifera		1	1
Palmella sp	B	1	1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale. 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100 % ☐

Depth (m) <0.25 5 % ☐ 0.25-0.5 25 % ☐ >0.5-1 20 % ☐ >1.0 50 % ☐

Substrate Bedrock ___% ☐ Boulders ___% ☐ Cobbles ___% ☐ Pebbles 15 % ☐ Gravel 10 % ☐

Sand 10 % ☐ Silt/Mud 5 % ☐ Clay ___% ☐ Peat ___% ☐ Not visible 60

Habitat Pool ___% ☐ Slack 100 % ☐ Riffle ___% ☐ Run ___% ☐

Shading: Left Bank None 95 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 5 % ☐

Right Bank None 90 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 10 % ☐

Water Clarity Clear 100 % ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 15 % ☐ Unstble 20 % ☐ Soft 5 % ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites	Wharfe 17	**Comparability**	A
Sites	Wharfe 18	**Comparability**	A
Sites		**Comparability**	

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	
Algae	☐	
Others	☐	

Comments (including observations on plant condition, algal and epiphyte growth)

Grapnel + wading used.
Some filamentous algae on substrate.

Macrophyte Survey Form

River: Wharfe
Site name: 15, Boston Spa
Length: 100m
Scale used: A / (C) (delete as appropriate)

NGR: SE 423465
Date: 9/7/98
Surveyor: MG/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		2
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		1
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis (A)		1
Elodea nuttallii (B)		3
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii B		1
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		1
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE		
Myosotis scorpioides			1
Phalaris arundinacea			2
Agrostis stolonifera			1
			1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100% ☐

Depth (m) <0.25 ___% ☐ 0.25-0.5 ___% ☐ >0.5-1 10% ☐ >1.0 90% ☐

Substrate Bedrock ___% ☐ Boulders ___% ☐ Cobbles ___% ☐ Pebbles ___% ☐ Gravel 5% ☐

Sand 5% ☐ Silt/Mud 10% ☐ Clay ___% ☐ Peat ___% ☐ Not visible 80

Habitat Pool ___% ☐ Slack 100% ☐ Riffle ___% ☐ Run ___% ☐

Shading: Left Bank None 95% ☐ Slight ___% ☐ Mod. ___% ☐ Dense 5% ☐

Right Bank None 90% ☐ Slight ___% ☐ Mod. ___% ☐ Dense 10% ☐

Water Clarity Clear 100% ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable ___% ☐ Unstble 10% ☐ Soft 10% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites	Wharfe 17	Comparability B
Sites	Wharfe 18	Comparability A
Sites		Comparability ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) B

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

Macrophyte Survey Form

River: Wharfe
Site name: 17, u/s Newton Kyme
Length: 500m
Scale used: (A) / C (delete as appropriate)

NGR: SE 455457
Date: 9/7/98
Surveyor: PS/MG

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	1	1
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg. (A)	5	3
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (A)	1	1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum	1	1
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica	1	1
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiformis		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii	1	1
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus	2	1
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum	3	2
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea		3	2
Agrostis stolonifera		1	1
Myosotis scorpioides		1	1
Rorippa sylvestris		1	1
Rumex sp.		1	1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 10 % ☐ >20 90 % ☐

Depth (m) <0.25 5 % ☐ 0.25-0.5 30 % ☐ >0.5-1 50 % ☐ >1.0 15 % ☐

Substrate Bedrock ___% ☐ Boulders 2 % ☐ Cobbles ___% ☐ Pebbles 5 % ☐ Gravel 70 % ☐

Sand 10 % ☐ Silt/Mud 3 % ☐ Clay ___% ☐ Peat ___% ☐ Not visible 10

Habitat Pool ___% ☐ Slack 100 % ☐ Riffle ___% ☐ Run ___% ☐

Shading: Left Bank None 97 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 3 % ☐

Right Bank None 99 % ☐ Slight 1 % ☐ Mod. ___% ☐ Dense ___% ☐

Water Clarity Clear 90 % ☐ Cloudy 10 % ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 20 % ☐ Unstble 77 % ☐ Soft 3 % ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Wharfe 18 — Comparability B

Sites ___ — Comparability ☐

Sites ___ — Comparability ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ ___

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	
Algae	☐	
Others	☐	

Comments (including observations on plant condition, algal and epiphyte growth)

Myriophyllum and Potamogeton are in poor condition - sparse/scattered small clumps with epiphytic algae growth.
Discharge just u/s of site.

Macrophyte Survey Form

River: Wharfe
Site name: 17, u/s Newton Kyme
Length: 100m
Scale used: A (C) (delete as appropriate)

NGR: SE 455457
Date: 9/7/98
Surveyor: PS | MG

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatilis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg. (A)		1
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (A)		1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		1
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		1
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiformis		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		1
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		1
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		1
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Myosotis scorpioides			1
Rorippa Sylvestris			1
Phalaris arundinacea			2
Rumex sp.			1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100 % ☐

Depth (m) <0.25 5 % ☐ 0.25-0.5 35 % ☐ >0.5-1 60 % ☐ >1.0 ___% ☐

Substrate Bedrock ___% ☐ Boulders ___% ☐ Cobbles ___% ☐ Pebbles 10 % ☐ Gravel 60 % ☐

Sand 30 % ☐ Silt/Mud ___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool ___% ☐ Slack 100 % ☐ Riffle ___% ☐ Run ___% ☐

Shading: Left Bank None 96 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 4 % ☐

Right Bank None 100 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense ___% ☐

Water Clarity Clear 100 % ☐ Cloudy ___% ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 40 % ☐ Unstble 60 % ☐ Soft ___% ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites Wharfe 18 — Comparability B

Sites ___ — Comparability ☐

Sites ___ — Comparability ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) A

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ ___

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	___
Algae	☐	___
Others	☐	___

Comments (including observations on plant condition, algal and epiphyte growth)

Macrophyte Survey Form

River: Wharfe
Site name: 18, Tadcaster Weir
Length: 500m
Scale used: (A) C (delete as appropriate)

NGR: SE 485439
Date: 9/7/98
Surveyor: MG/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatilis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica (B)	1	1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum	2	1
Nuphar lutea	5	3
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium	1	1
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp pseudofluitans		
Ran. penic. subsp peniciliatus		
Ran. penic. subsp vertumnus		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica	1	1
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus	1	1
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii	1	1
Glyceria maxima	2	2
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus	1	1
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia	1	1
Schoenoplectus lacustris		
Sparganium emersum	1	1
Sparganium erectum	3	2
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea		3	2
Myosotis scorpioides		1	1
Agrostis stolonifera		1	1
Odontiocerus fontanum	A	2	2
Melosira sp	B	2	2

%	C	A
<0.1%	1	1
0.1-1%	2	2
1-2.5%	3	3
2.5-5%	4	3
5-10%	5	4
10-25%	6	5
25-50%	7	5
50-75%	8	5
>75%	9	5

Area

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100 % ☐

Depth (m) <0.25 ___% ☐ 0.25-0.5 5 % ☐ >0.5-1 5 % ☐ >1.0 90 % ☐

Substrate Bedrock ___% ☐ Boulders 1 % ☐ Cobbles ___% ☐ Pebbles ___% ☐ Gravel ___% ☐

Sand ___% ☐ Silt/Mud 4 % ☐ Clay ___% ☐ Peat ___% ☐ Not visible 15

Habitat Pool ___% ☐ Slack 100 % ☐ Riffle ___% ☐ Run ___% ☐

Shading: Left Bank None 95 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 5 % ☐

Right Bank None 98 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 2 % ☐

Water Clarity Clear ___% ☐ Cloudy 100 % ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable 1 % ☐ Unstble ___% ☐ Soft 4 % ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) B

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

Grapnel used

A. nodiflorum, E. hirsutum, S. auriculata often trailing in water but rooted well up bank.

Boulders at bridge provide surface for mosses.

Very little vegetation in centre of channel.

Macrophyte Survey Form

River: Wharfe
Site name: 18, Tadcaster Weir
Length: 100m
Scale used: A / (C) (delete as appropriate)

NGR: SE 485439
Date: 9/7/98
Surveyor: MG IPS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatilis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		1
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		2
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		1
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiformis		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		1
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		1
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		1
Sparganium erectum		1
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Agrostis stolonifera			1
Phalaris arundinacea			2
Melosira sp	B		2

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 100% ☐

Depth (m) <0.25 ___% ☐ 0.25-0.5 ___% ☐ >0.5-1 10 % ☐ >1.0 90 % ☐

Substrate Bedrock ___% ☐ Boulders ___% ☐ Cobbles ___% ☐ Pebbles ___% ☐ Gravel ___% ☐

Sand ___% ☐ Silt/Mud 5 % ☐ Clay ___% ☐ Peat ___% ☐ Not visible 95

Habitat Pool ___% ☐ Slack 100 % ☐ Riffle ___% ☐ Run ___% ☐

Shading: Left Bank None 95 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense 5 % ☐

Right Bank None 100 % ☐ Slight ___% ☐ Mod. ___% ☐ Dense ___% ☐

Water Clarity Clear ___% ☐ Cloudy 100 % ☐ Turbid ___% ☐

Bed Stability Firm ___% ☐ Stable ___% ☐ Unstble ___% ☐ Soft 5 % ☐

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) B

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

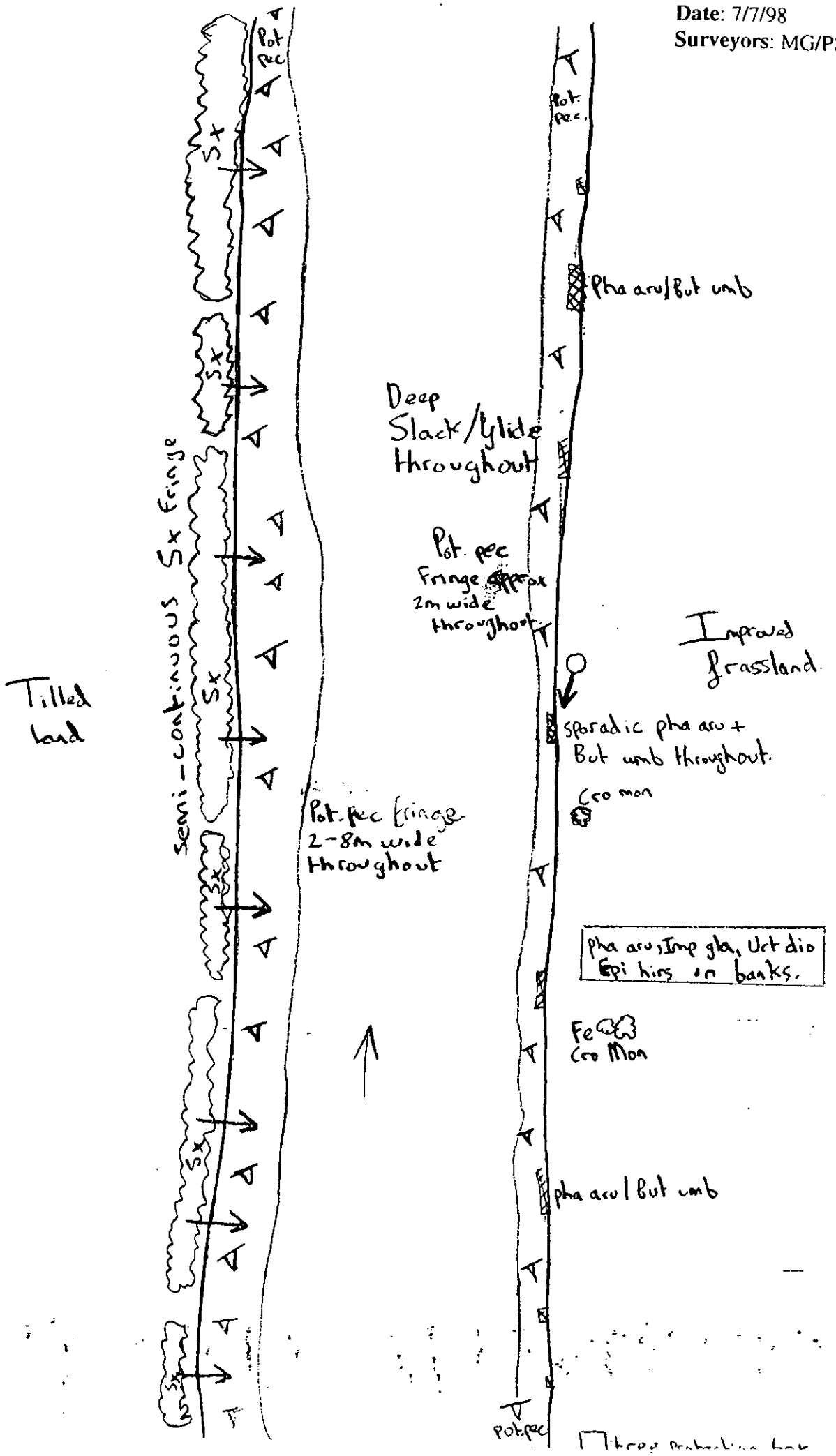
_____

_____

Appendix II. Sketch maps.

River: Ouse **Site**: d/s Moor Monkton intake (1)

NGR: SE 536570
Date: 7/7/98
Surveyors: MG/PS



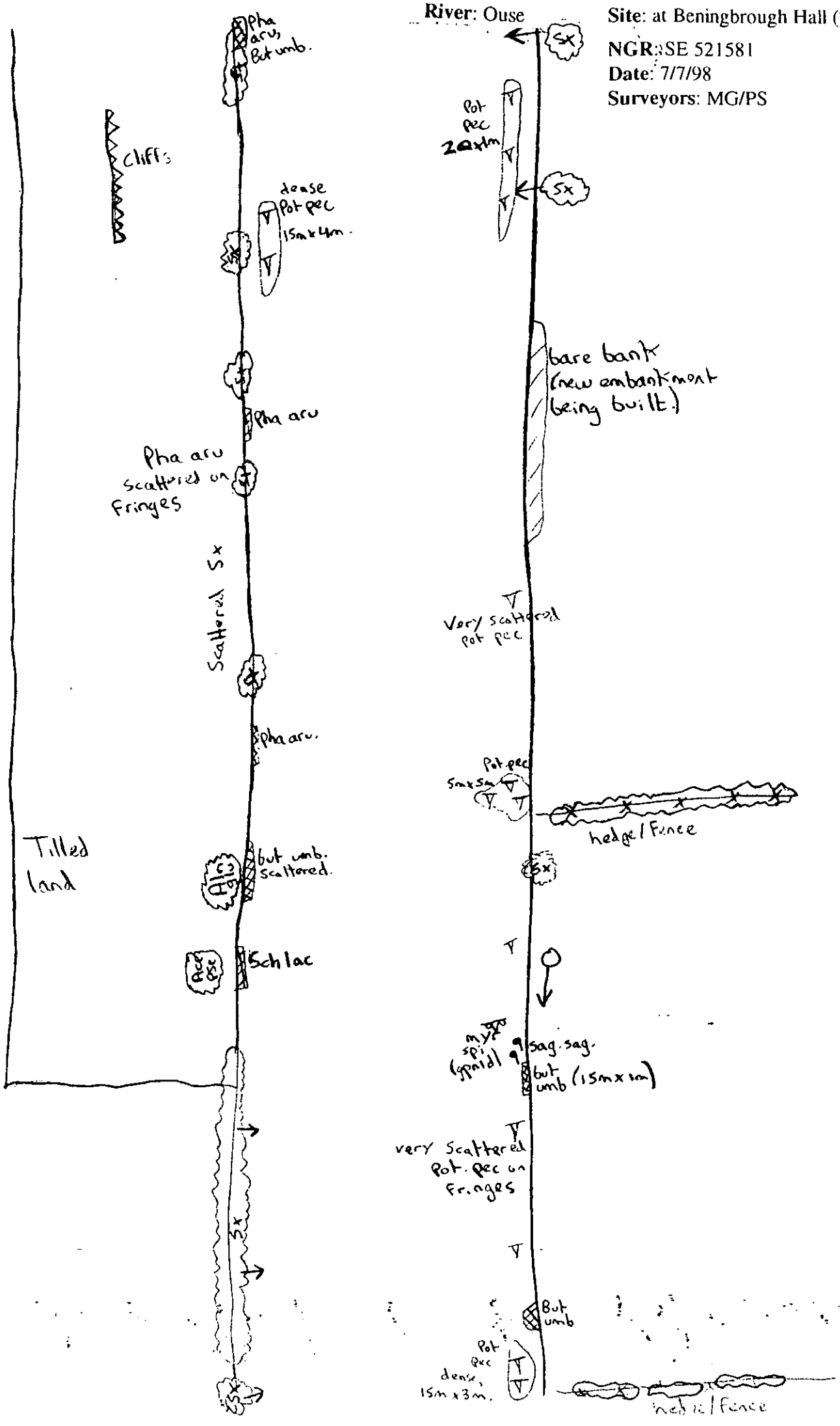
River: Ouse

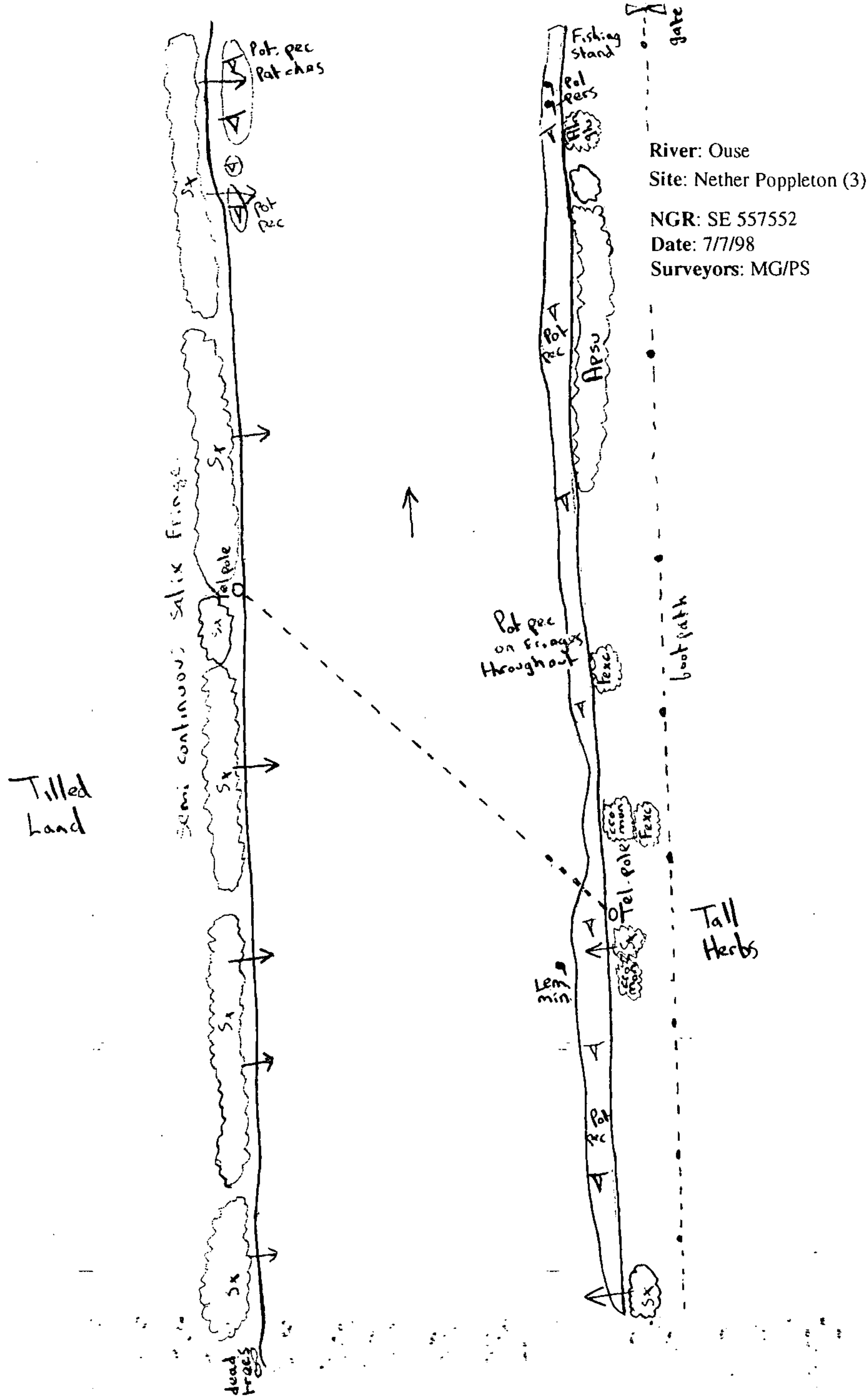
Site: at Beningbrough Hall (2)

NGR: SE 521581

Date: 7/7/98

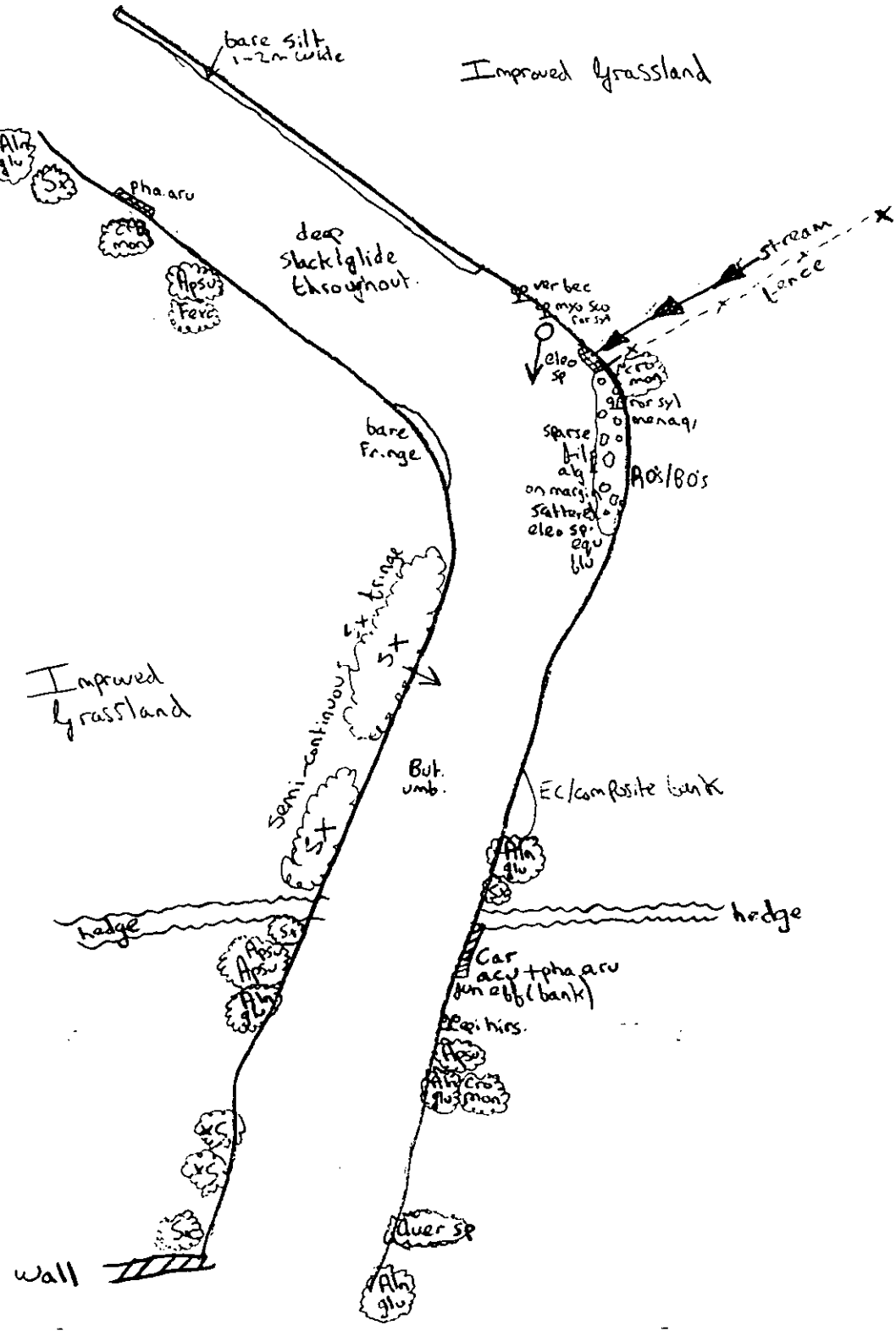
Surveyors: MG/PS



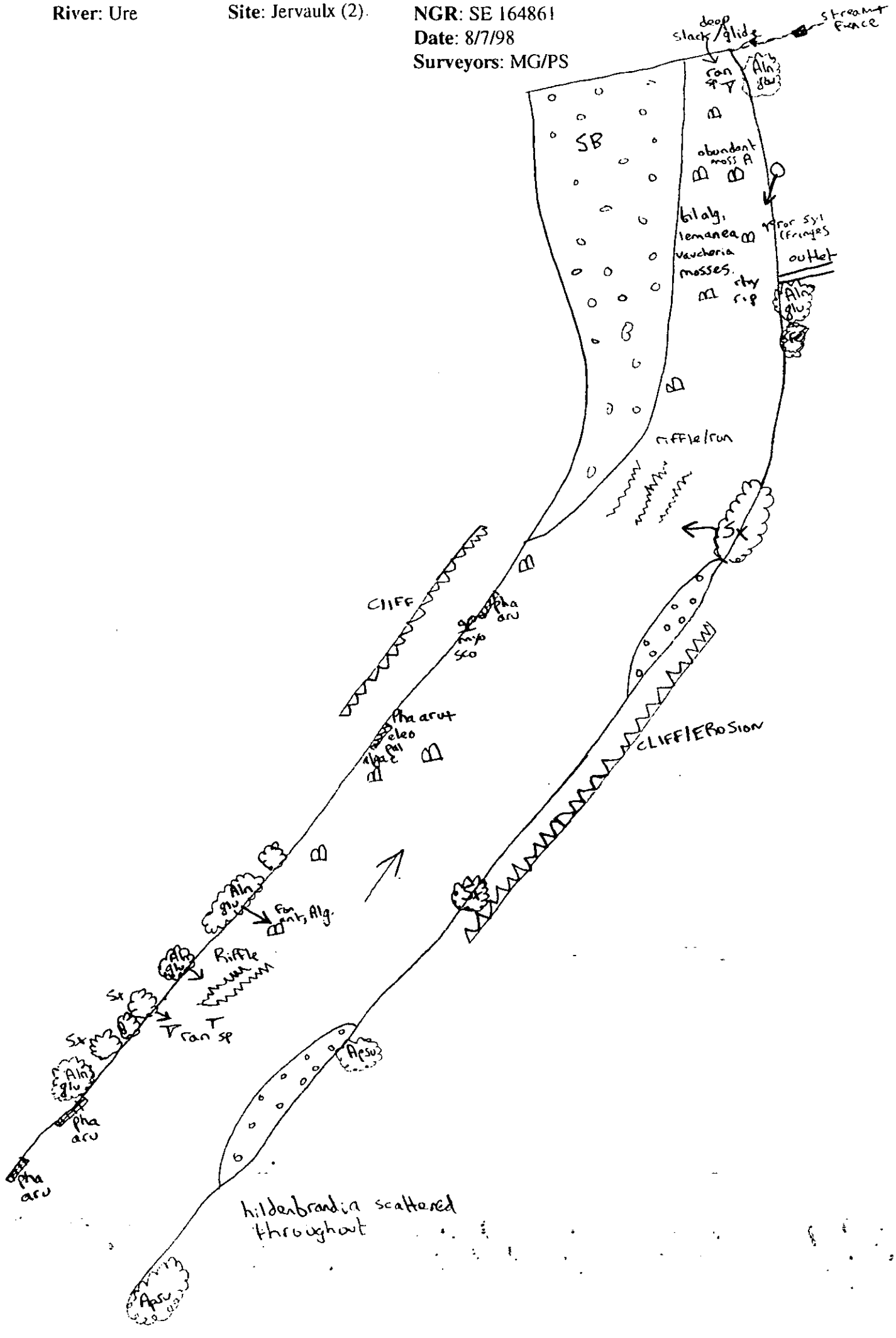


River: Ouse
Site: Nether Poppleton (3)
NGR: SE 557552
Date: 7/7/98
Surveyors: MG/PS

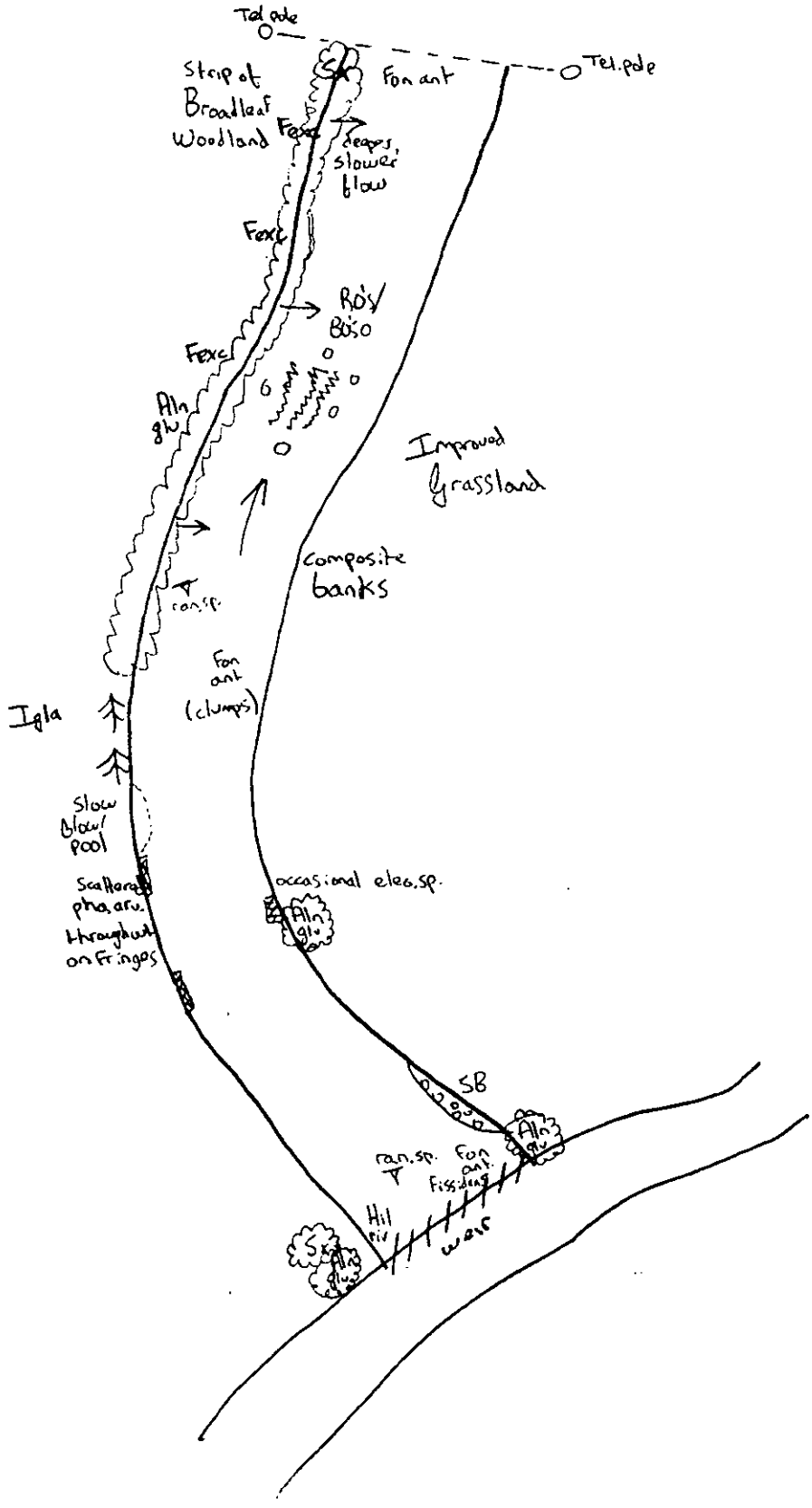
River: Ure **Site**: Ulshaw (1b) **NGR**: SE 145872
Date: 8/7/98
Surveyors: MG/PS



River: Ure Site: Jervaulx (2). NGR: SE 164861
Date: 8/7/98
Surveyors: MG/PS

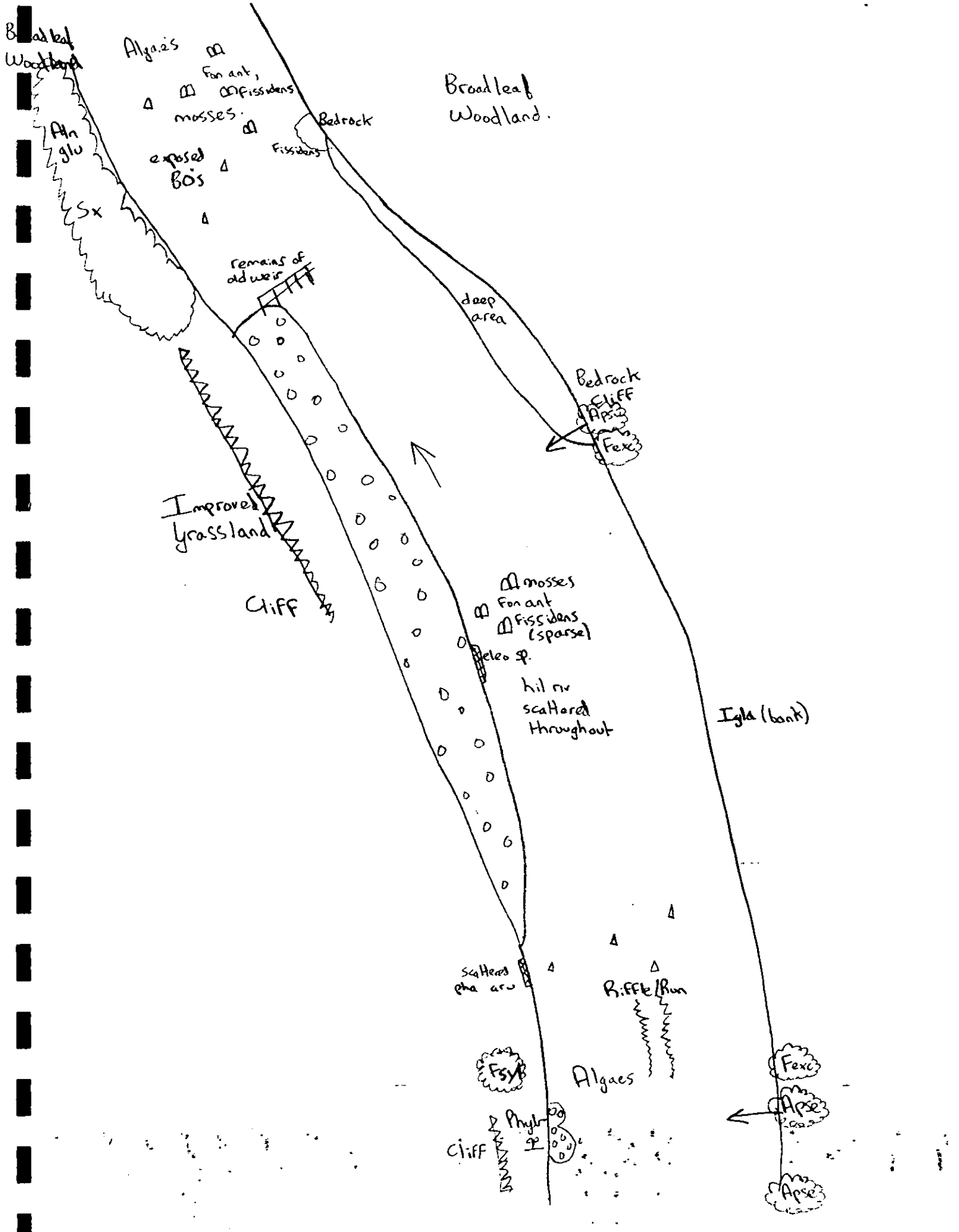


River: Ure **Site**: d/s Kilgram Bridge intake (2b) **NGR**: SE 191860
Date: 8/7/98
Surveyors: MG/PS



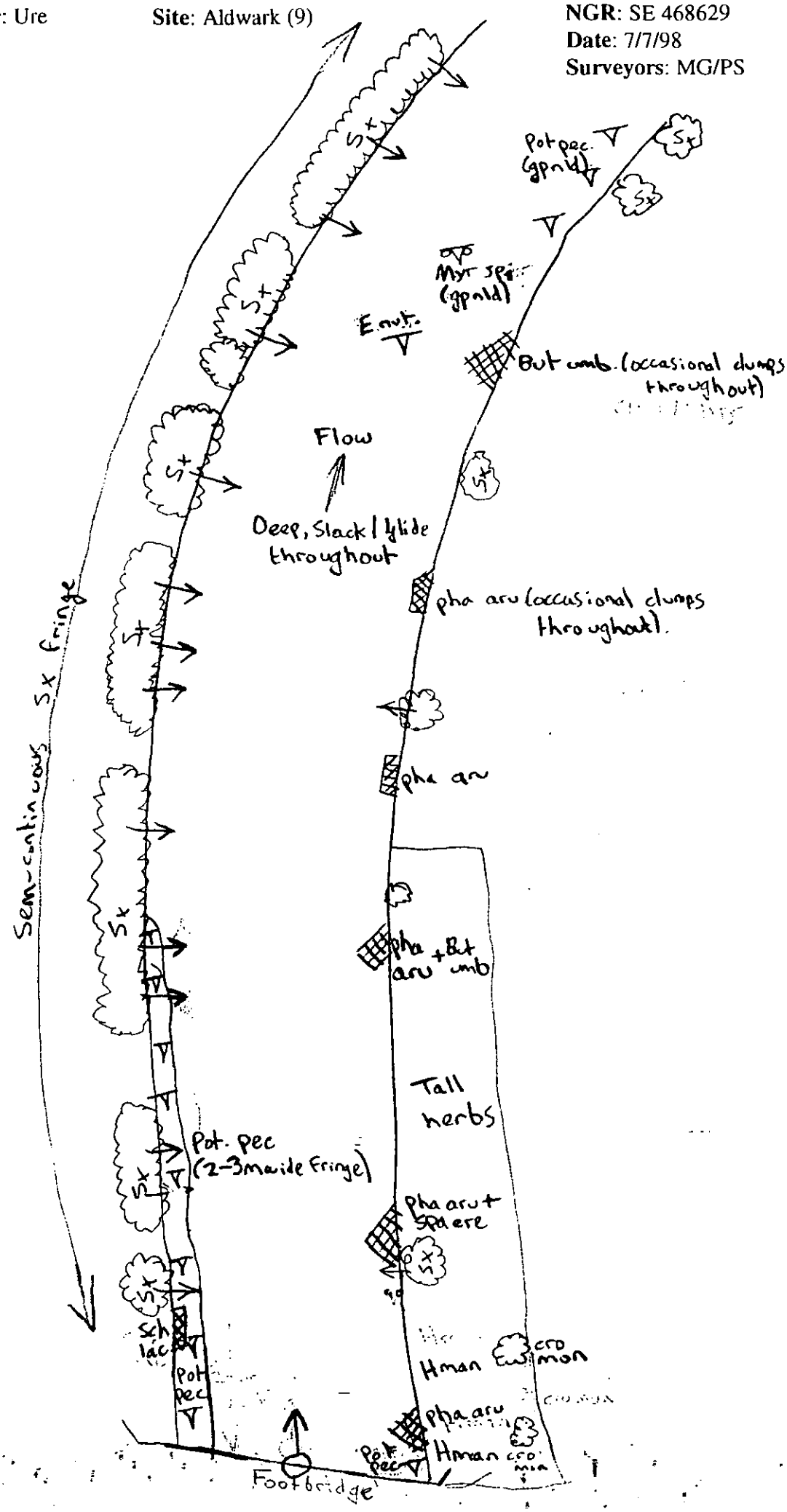
River: Ure **Site**: Clifton Castle (3)

NGR: SE 222831
Date: 8/7/98
Surveyors: MG/PS



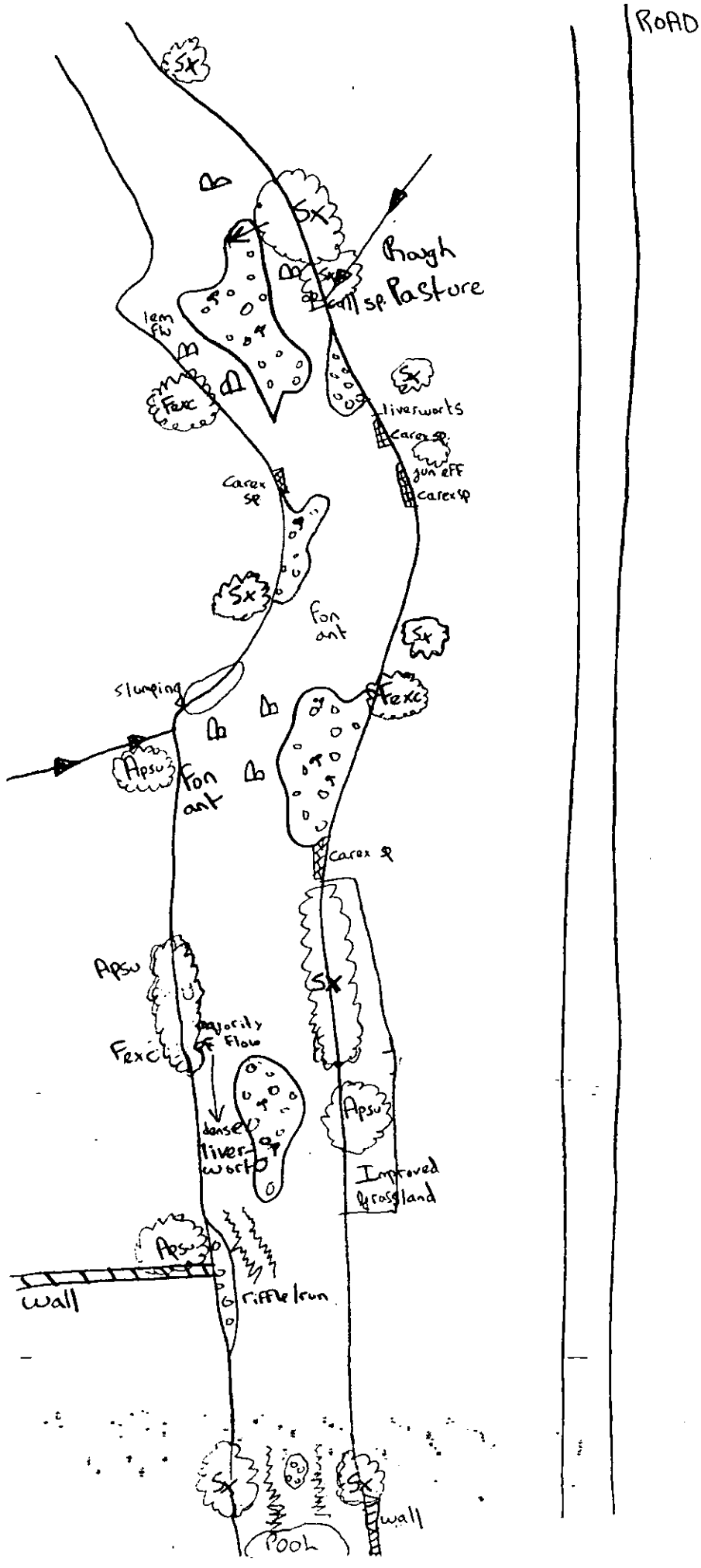
River: Ure Site: Aldwark (9)

NGR: SE 468629
Date: 7/7/98
Surveyors: MG/PS



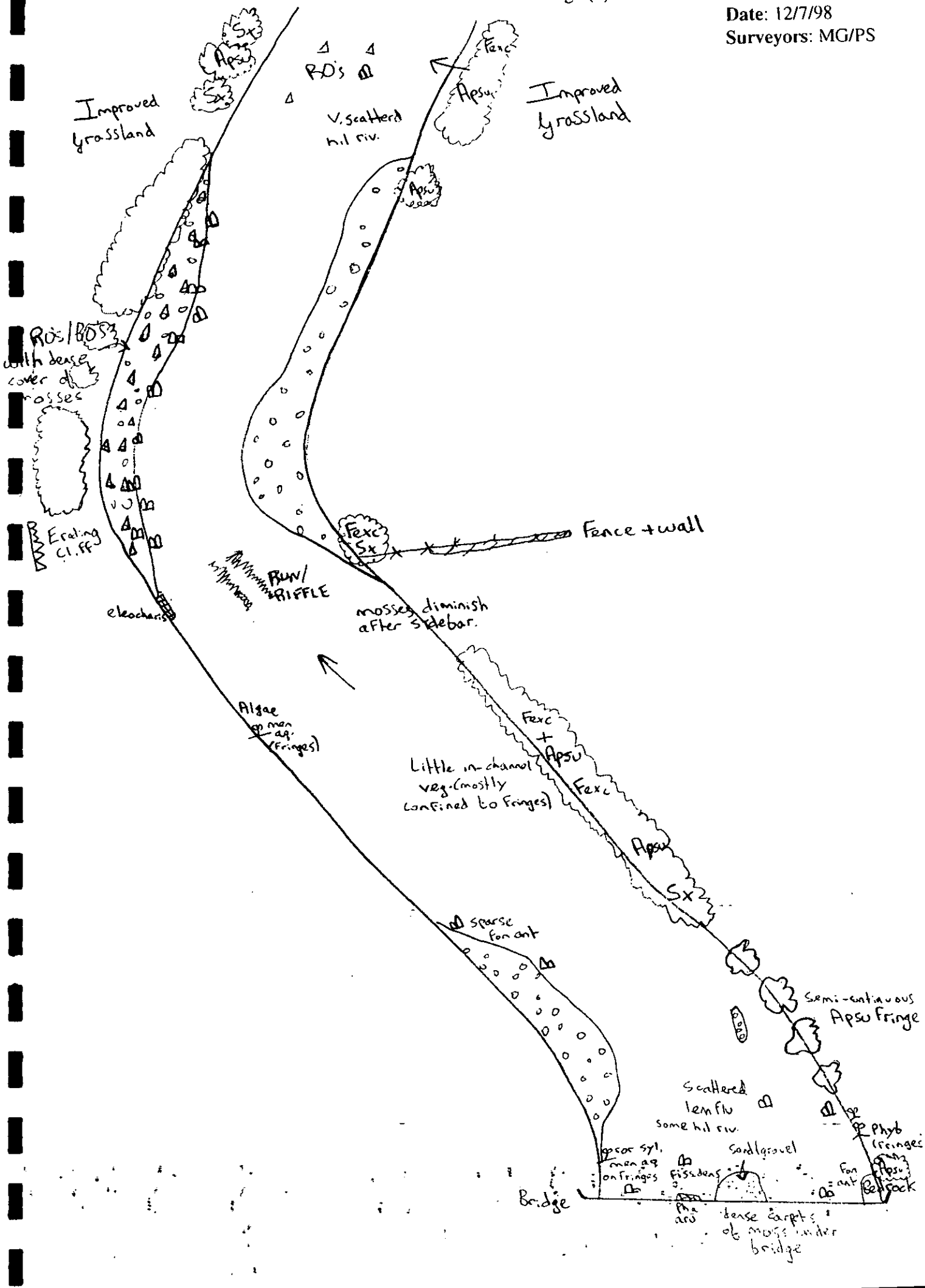
River: Wharfe **Site**: u/s Starbotton (1)

NGR: SD 946756
Date: 12/7/98
Surveyors: MG/PS



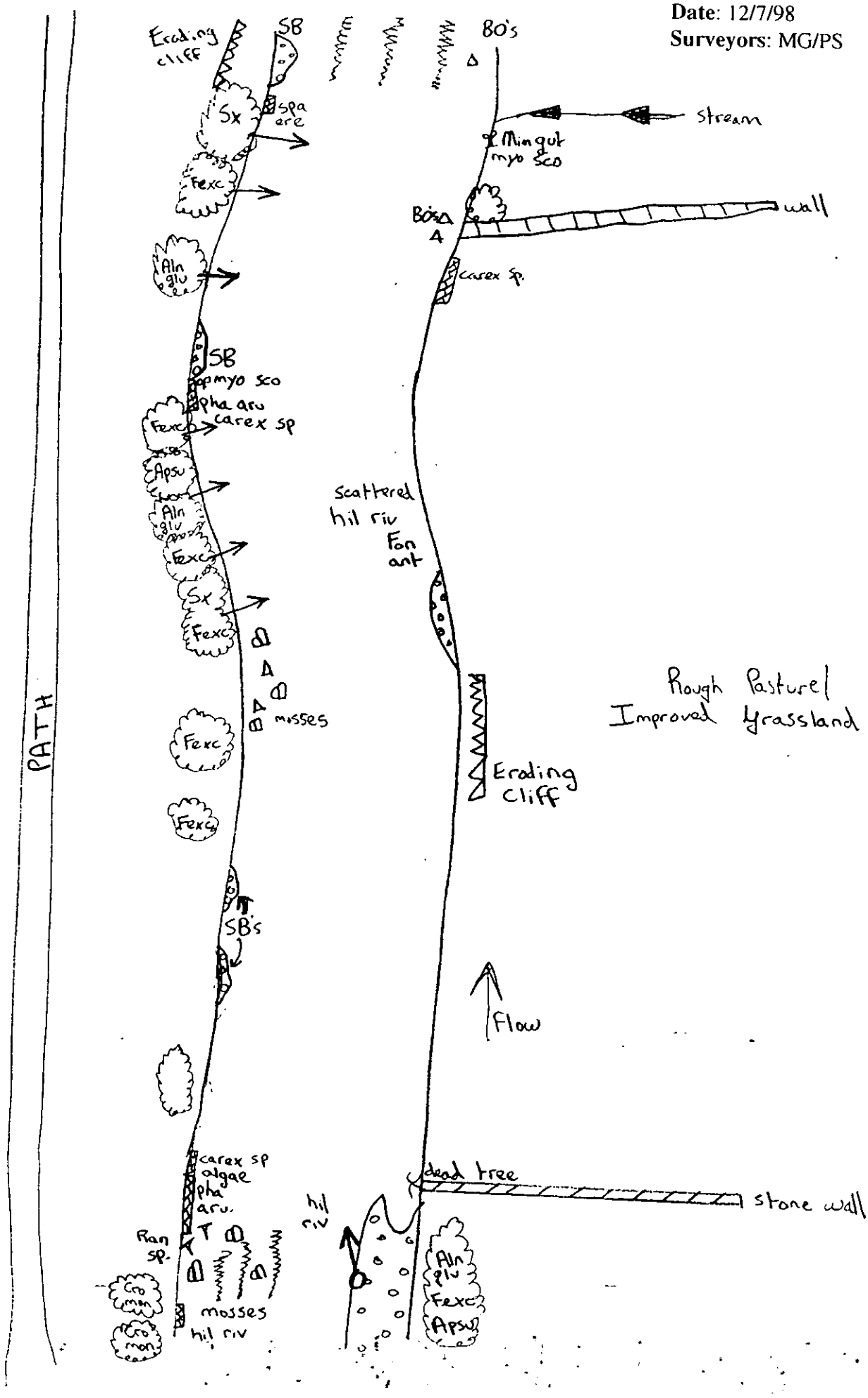
River: Wharfe **Site**: d/s Conistone Bridge (2)

NGR: SD 980672
Date: 12/7/98
Surveyors: MG/PS



River: Wharfe **Site**: u/s Hebden (3)

NGR: SE 015626
Date: 12/7/98
Surveyors: MG/PS

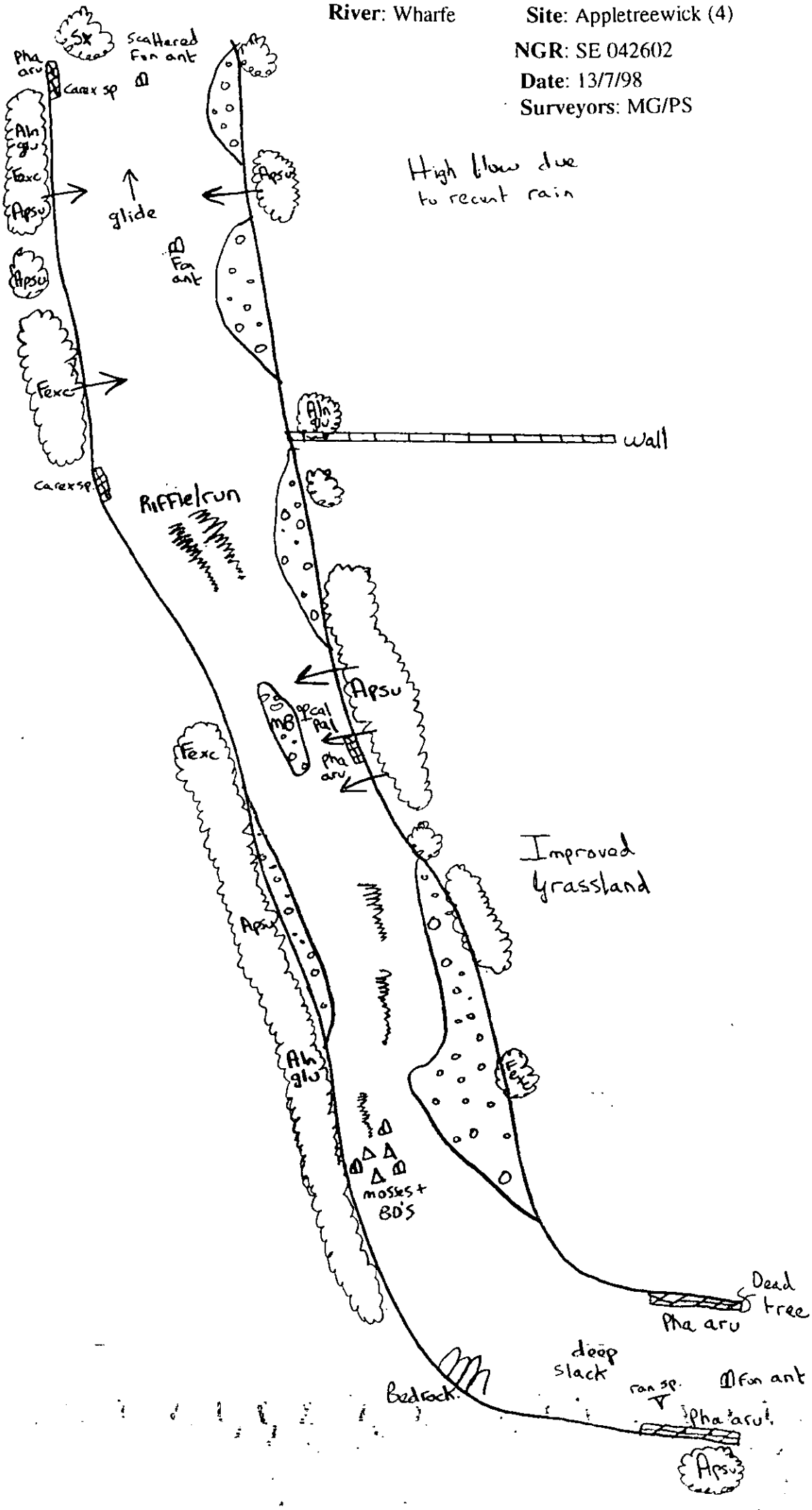


River: Wharfe **Site**: Appletreewick (4)

NGR: SE 042602

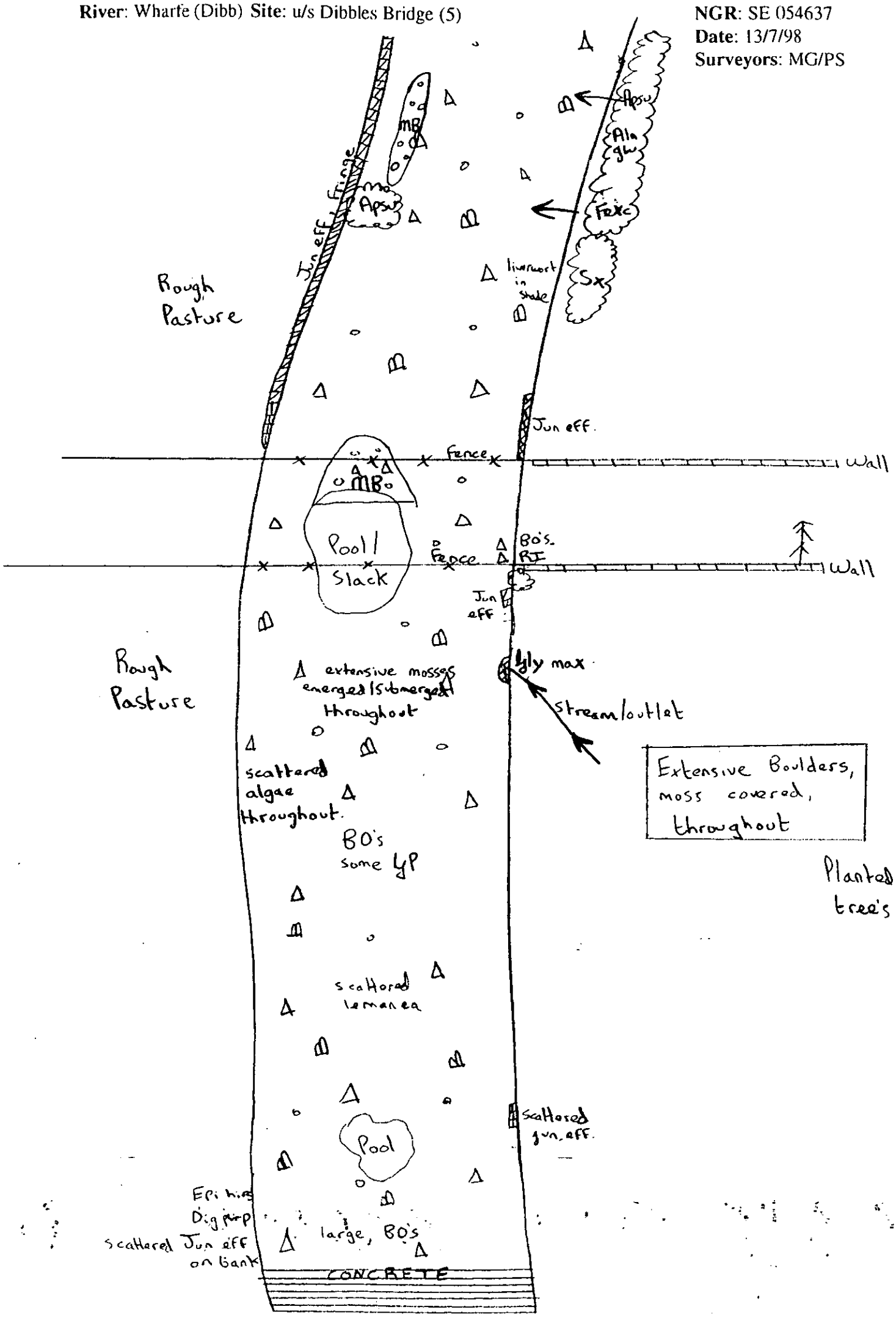
Date: 13/7/98

Surveyors: MG/PS



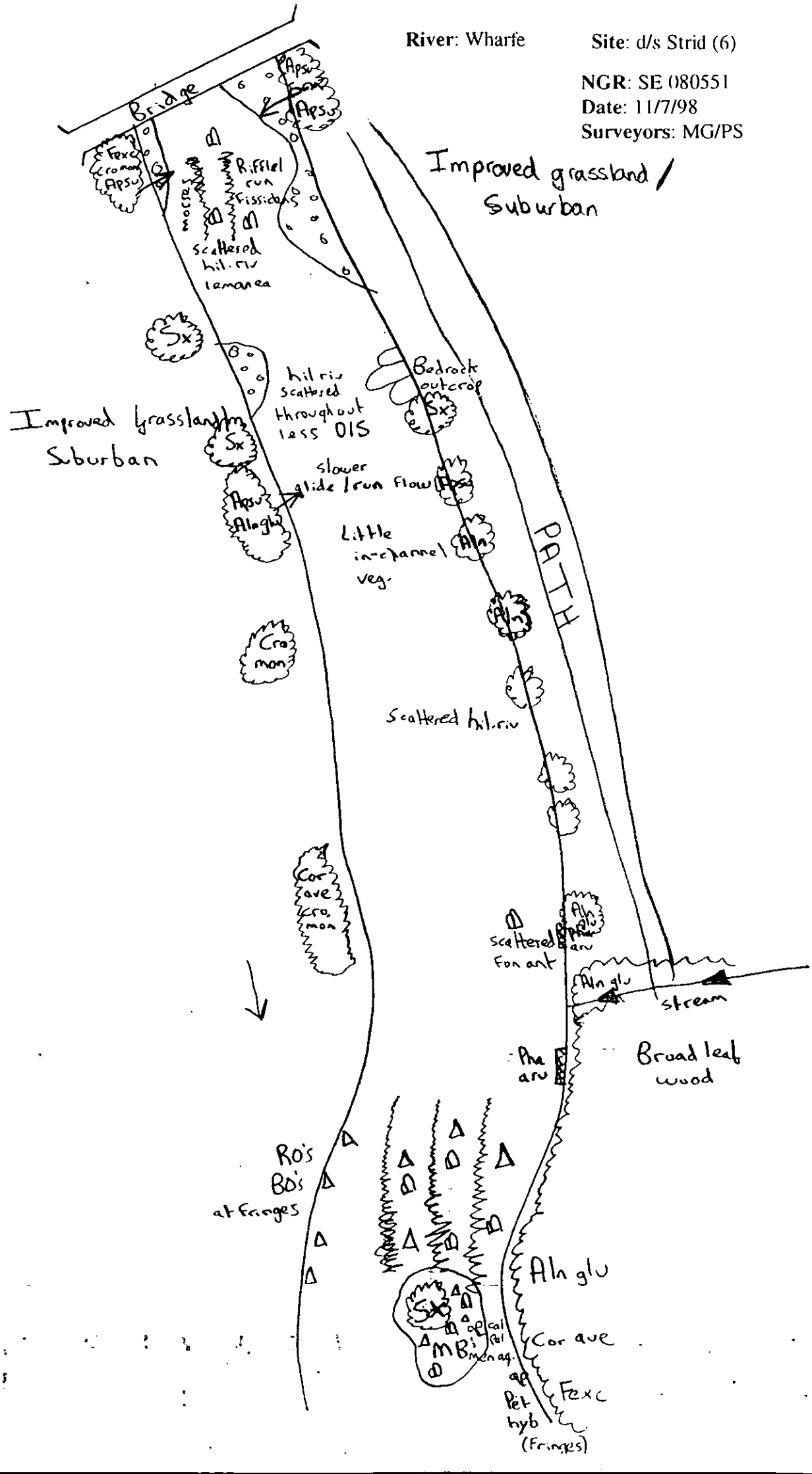
River: Wharfe (Dibb) **Site**: u/s Dibbles Bridge (5)

NGR: SE 054637
Date: 13/7/98
Surveyors: MG/PS



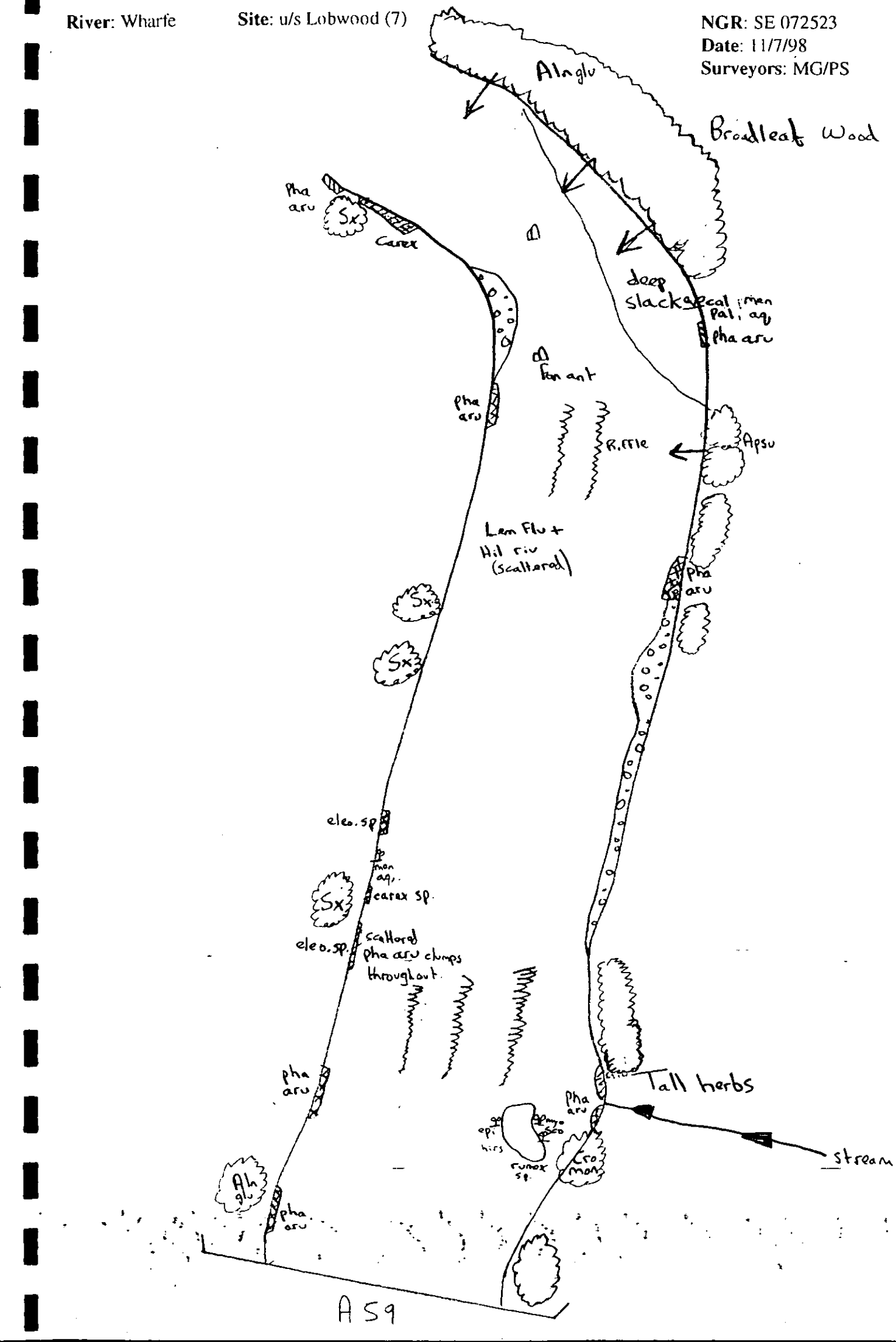
River: Wharfe **Site**: d/s Strid (6)

NGR: SE 080551
Date: 11/7/98
Surveyors: MG/PS

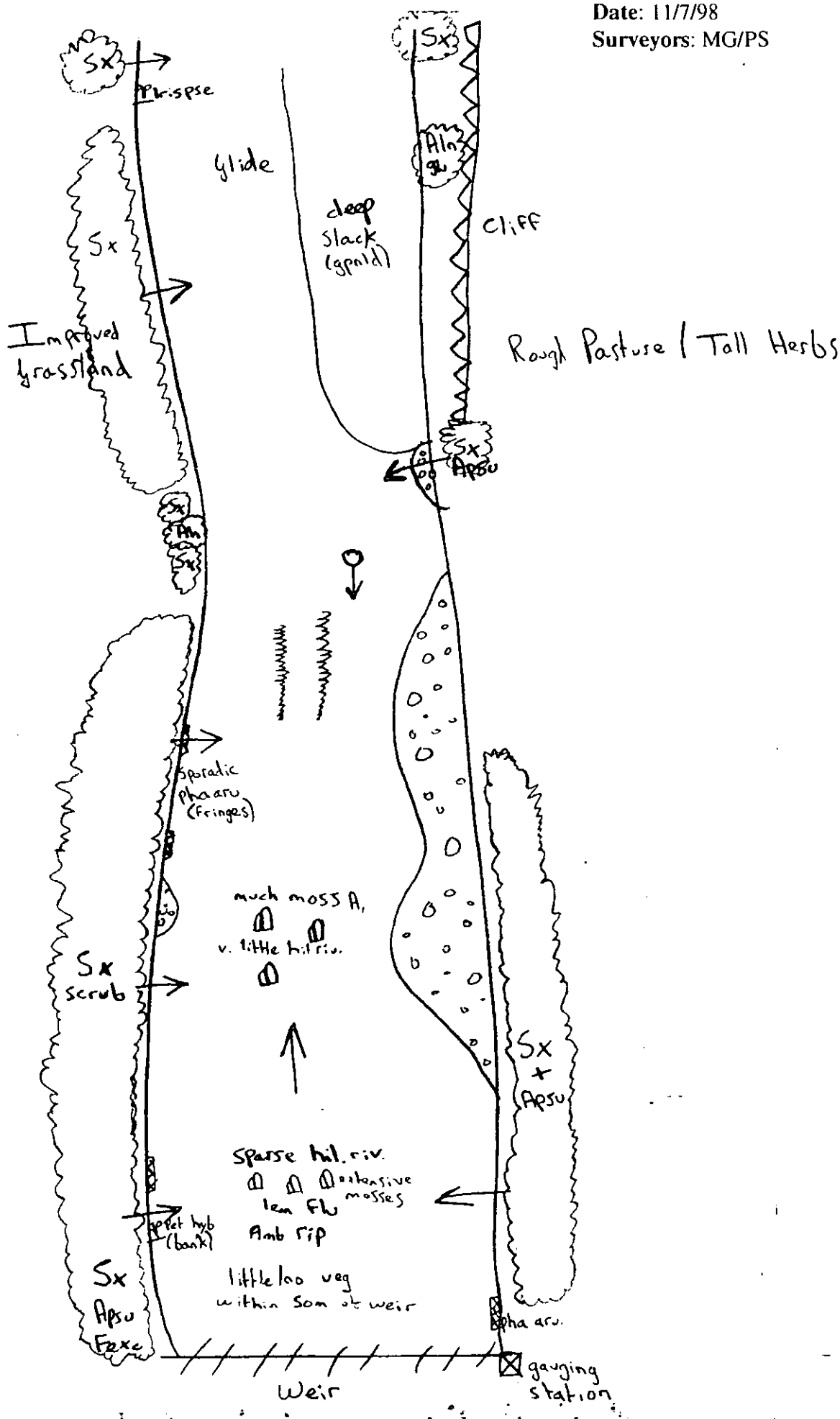


River: Wharfe **Site**: u/s Lobwood (7)

NGR: SE 072523
Date: 11/7/98
Surveyors: MG/PS

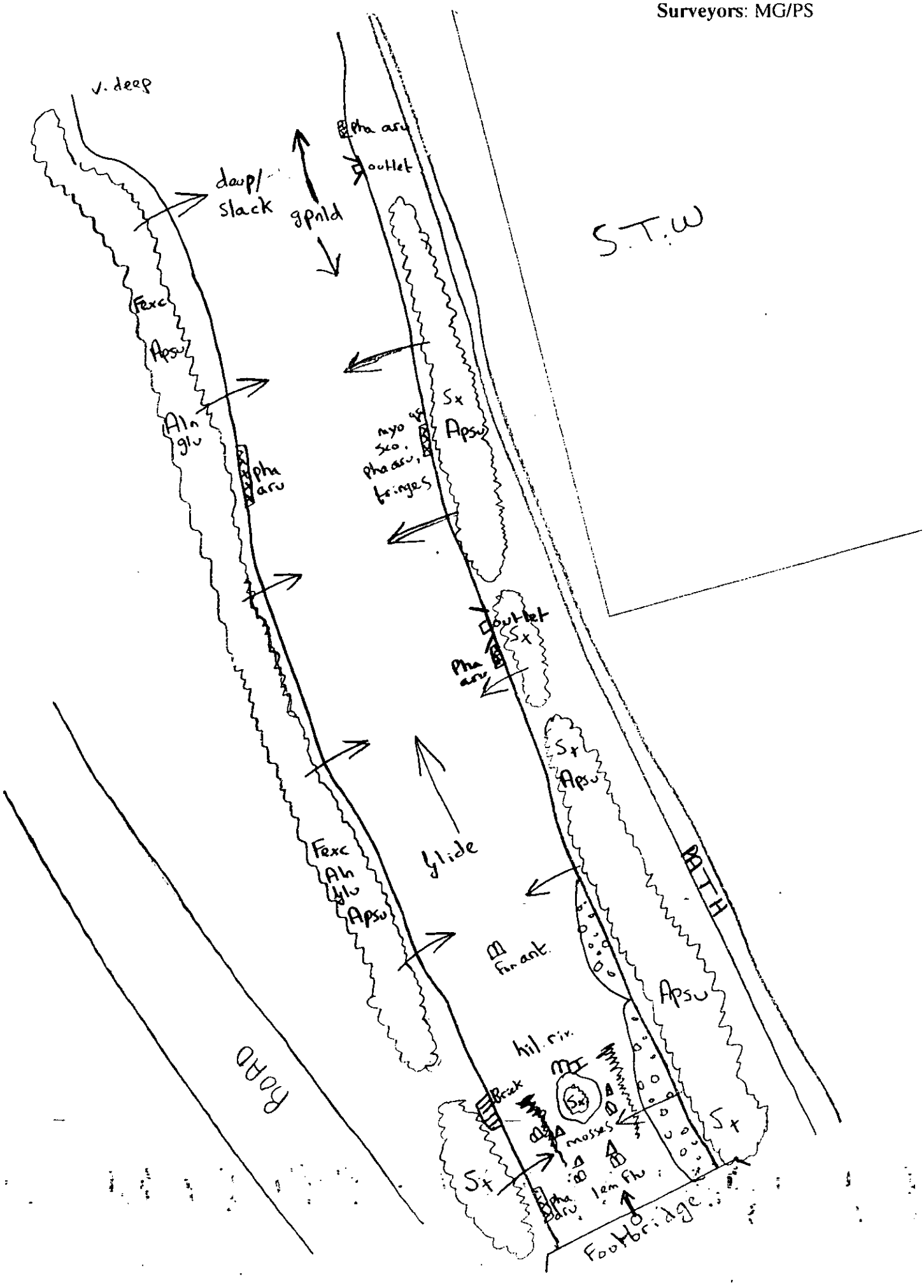


River: Wharfe **Site**: Addingham (d/s weir, 8) **NGR**: SE 091489
Date: 11/7/98
Surveyors: MG/PS



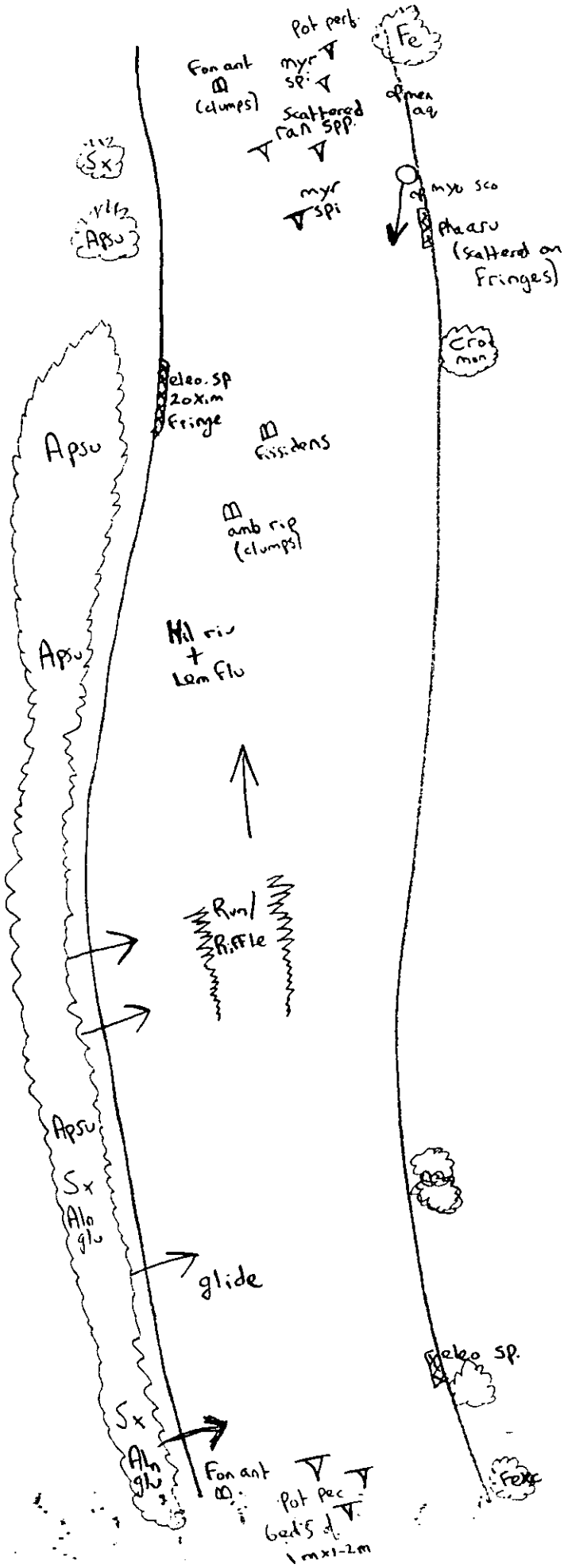
River: Wharfe **Site**: Ilkley (9)

NGR: SE 124484
Date: 11/7/98
Surveyors: MG/PS

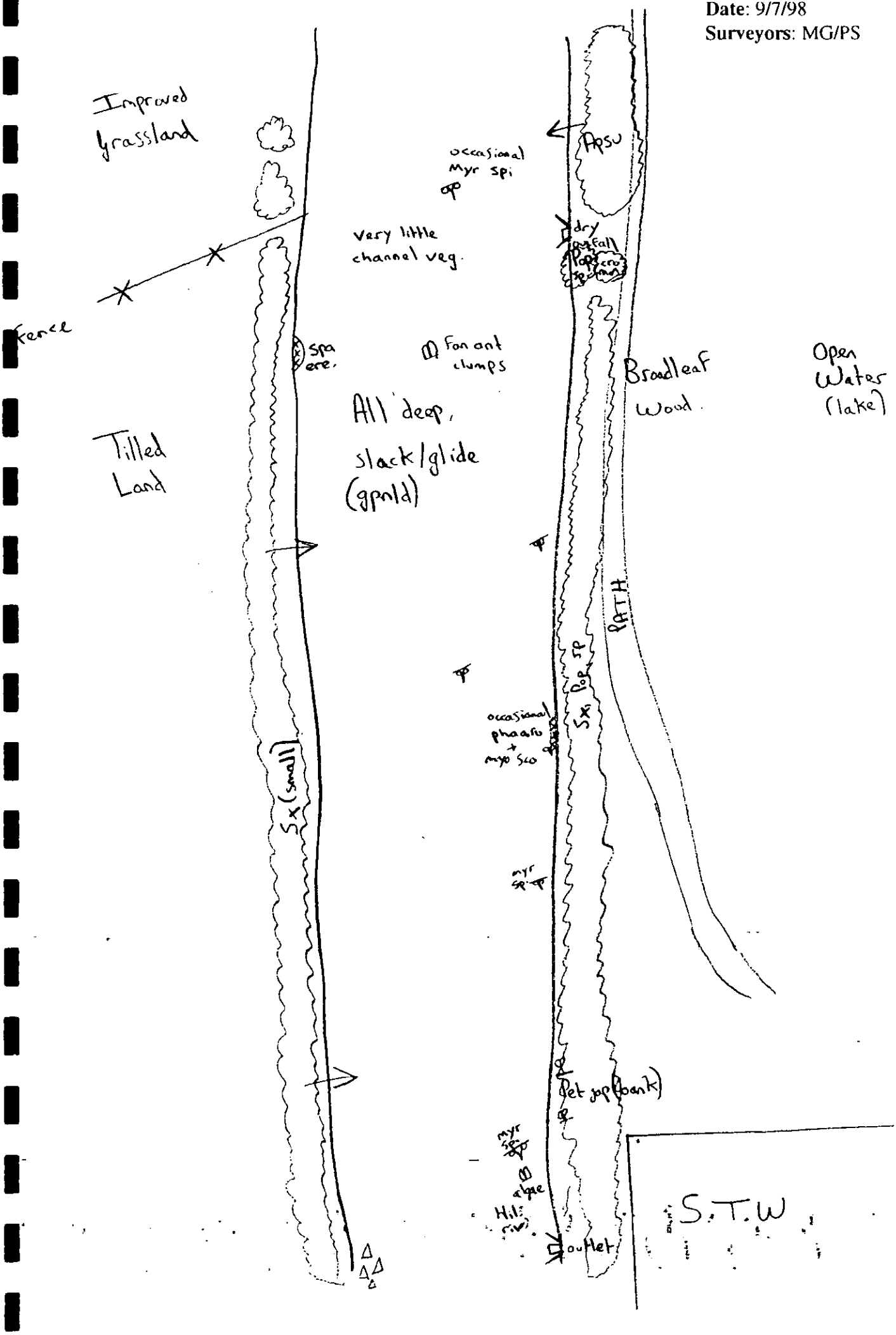


River: Wharfe **Site**: d/s Burley (10)

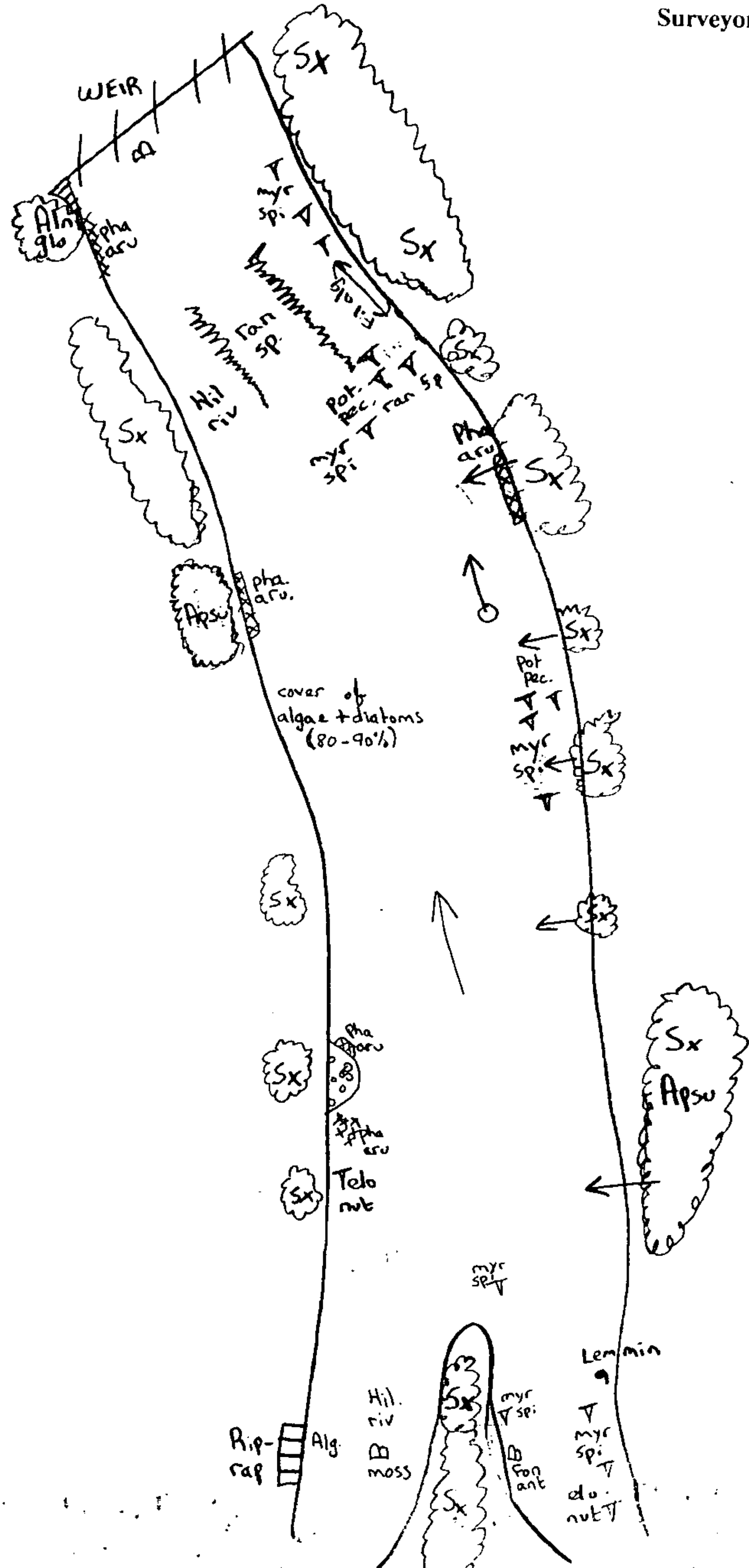
NGR: SE 175463
Date: 11/7/98
Surveyors: MG/PS



River: Wharfe **Site**: Knotford (11) **NGR**: SE 223463
Date: 9/7/98
Surveyors: MG/PS

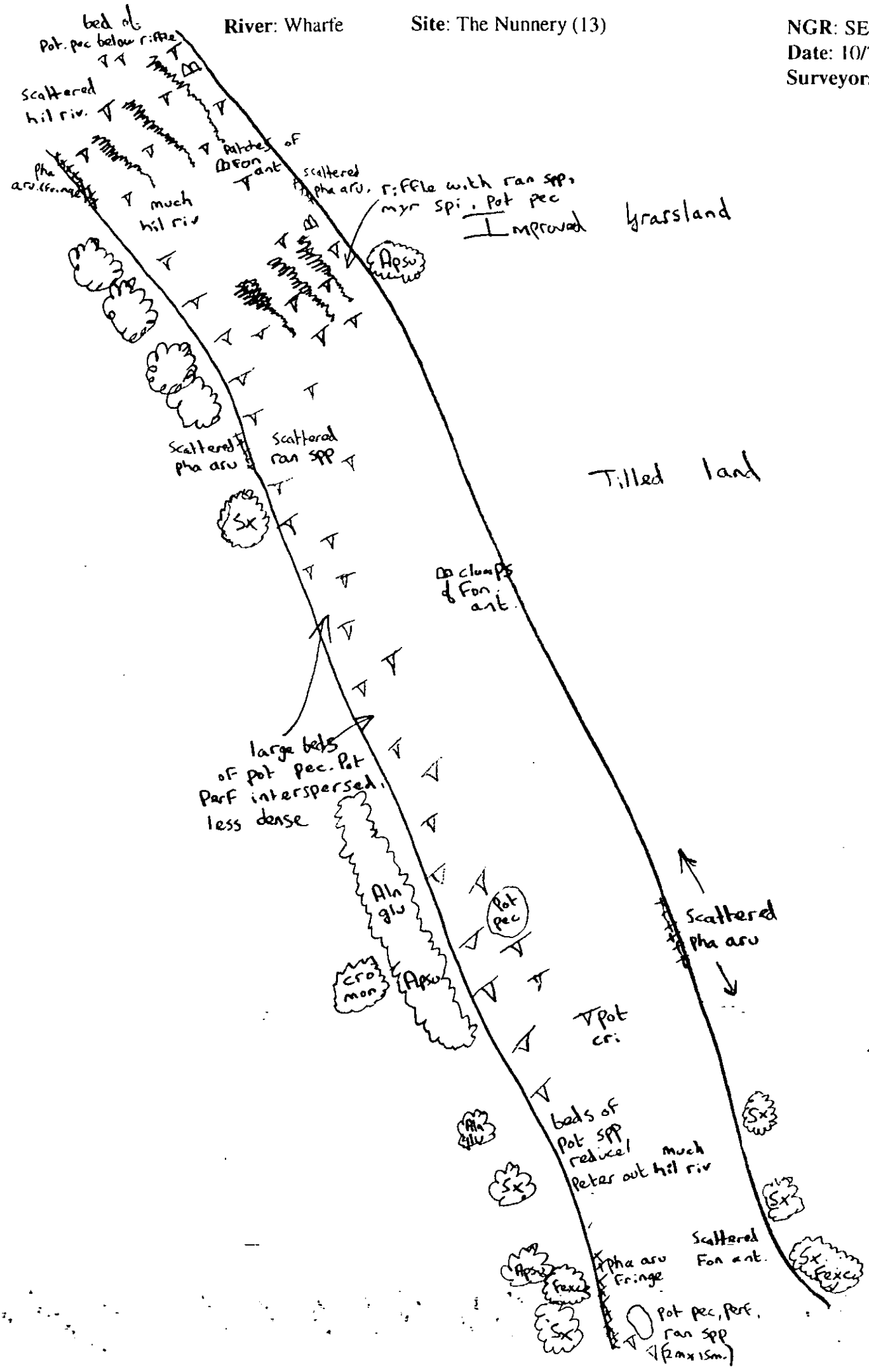


River: Wharfe **Site**: u/s Riffa Beck (12) **NGR**: SE 255456
Date: 10/7/98
Surveyors: MG/PS



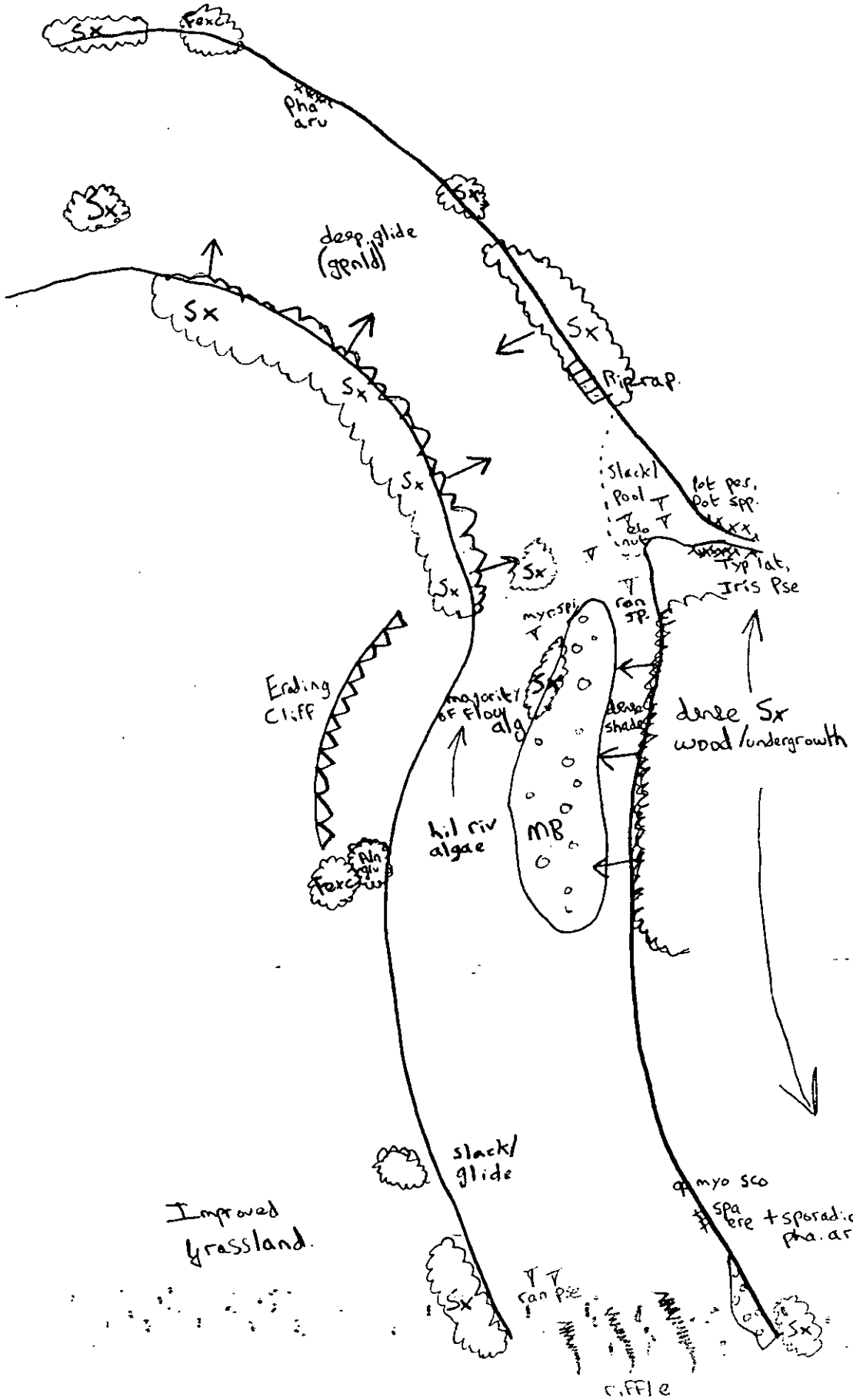
River: Wharfe **Site**: The Nunnery (13)

NGR: SE 288455
Date: 10/7/98
Surveyors: MG/P

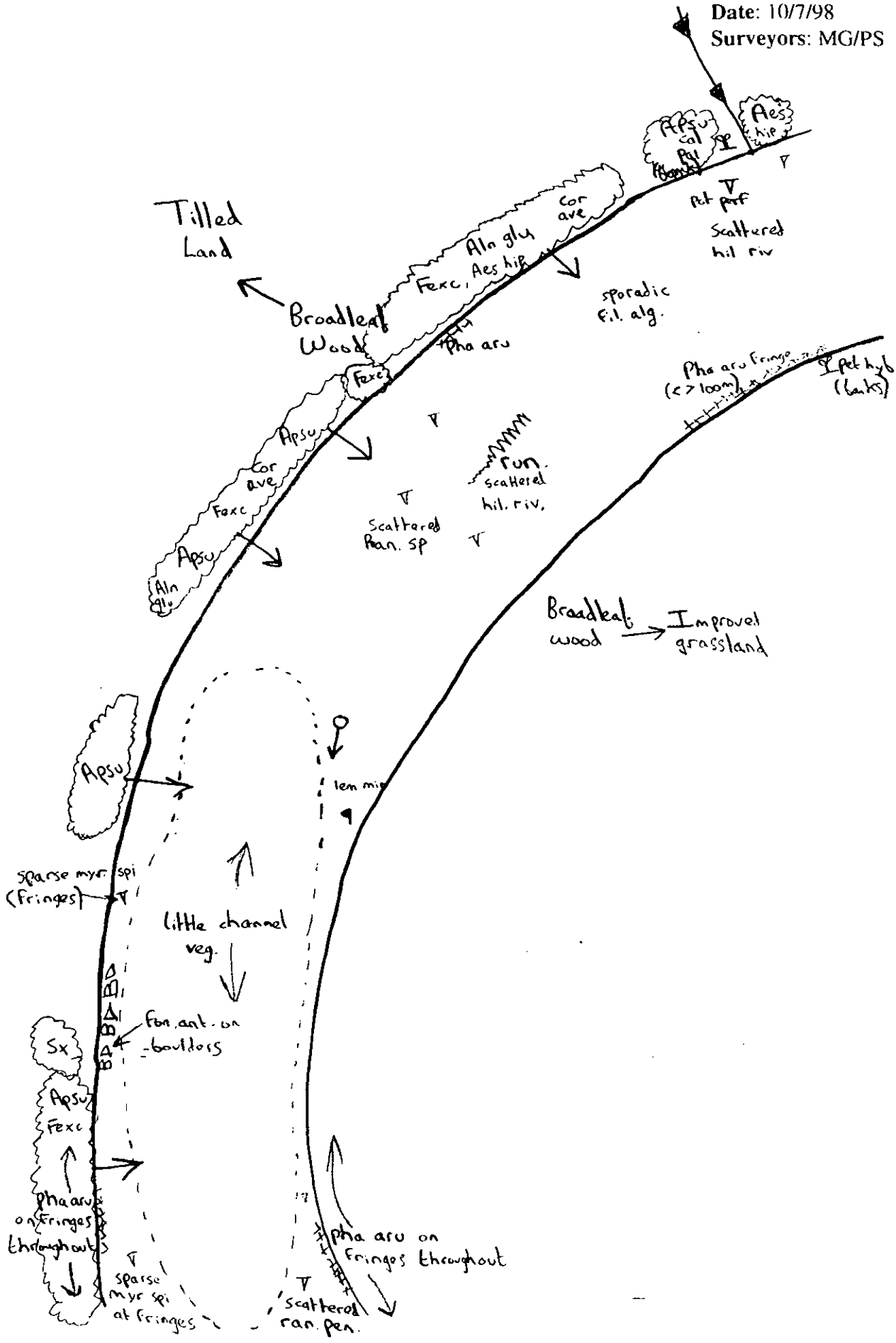


River: Wharfe **Site**: u/s Collingham (14)

NGR: SE 354457
Date: 10/7/98
Surveyors: MG/PS

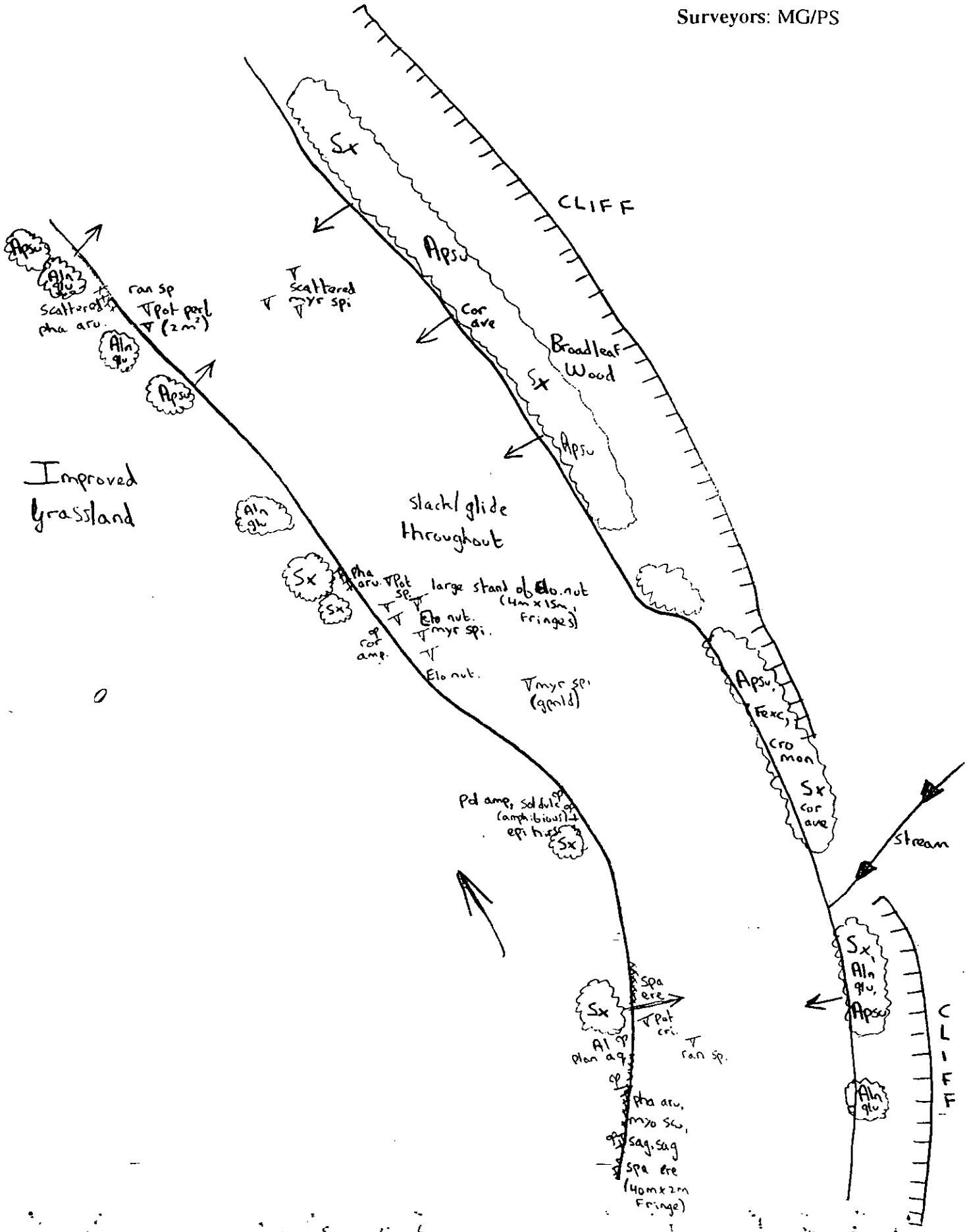


River: Wharfe **Site**: u/s Woodhall Hotel (16) **NGR**: SE 369467
Date: 10/7/98
Surveyors: MG/PS

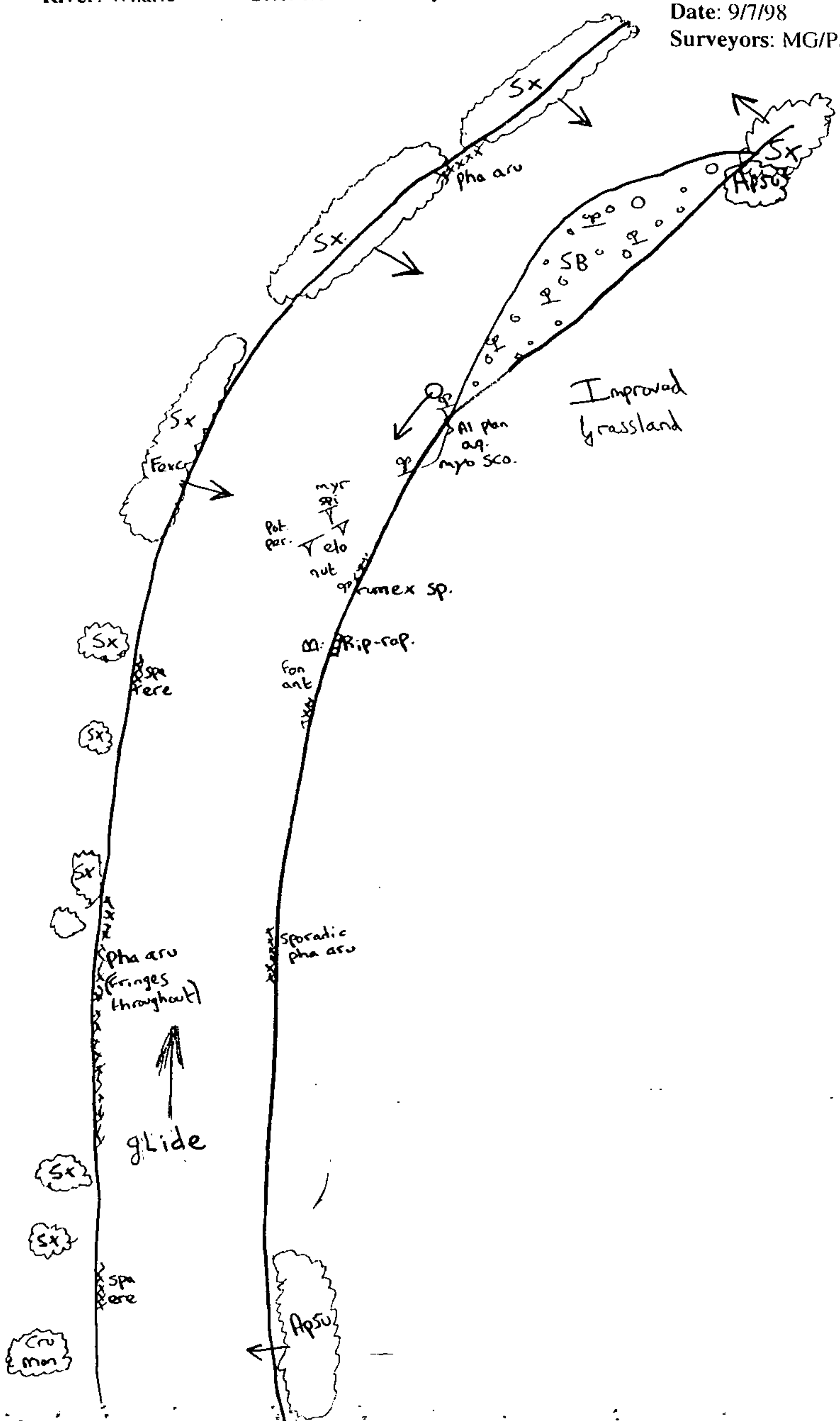


River: Wharfe **Site**: Boston Spa (15)

NGR: SE 423465
Date: 9/7/98
Surveyors: MG/PS

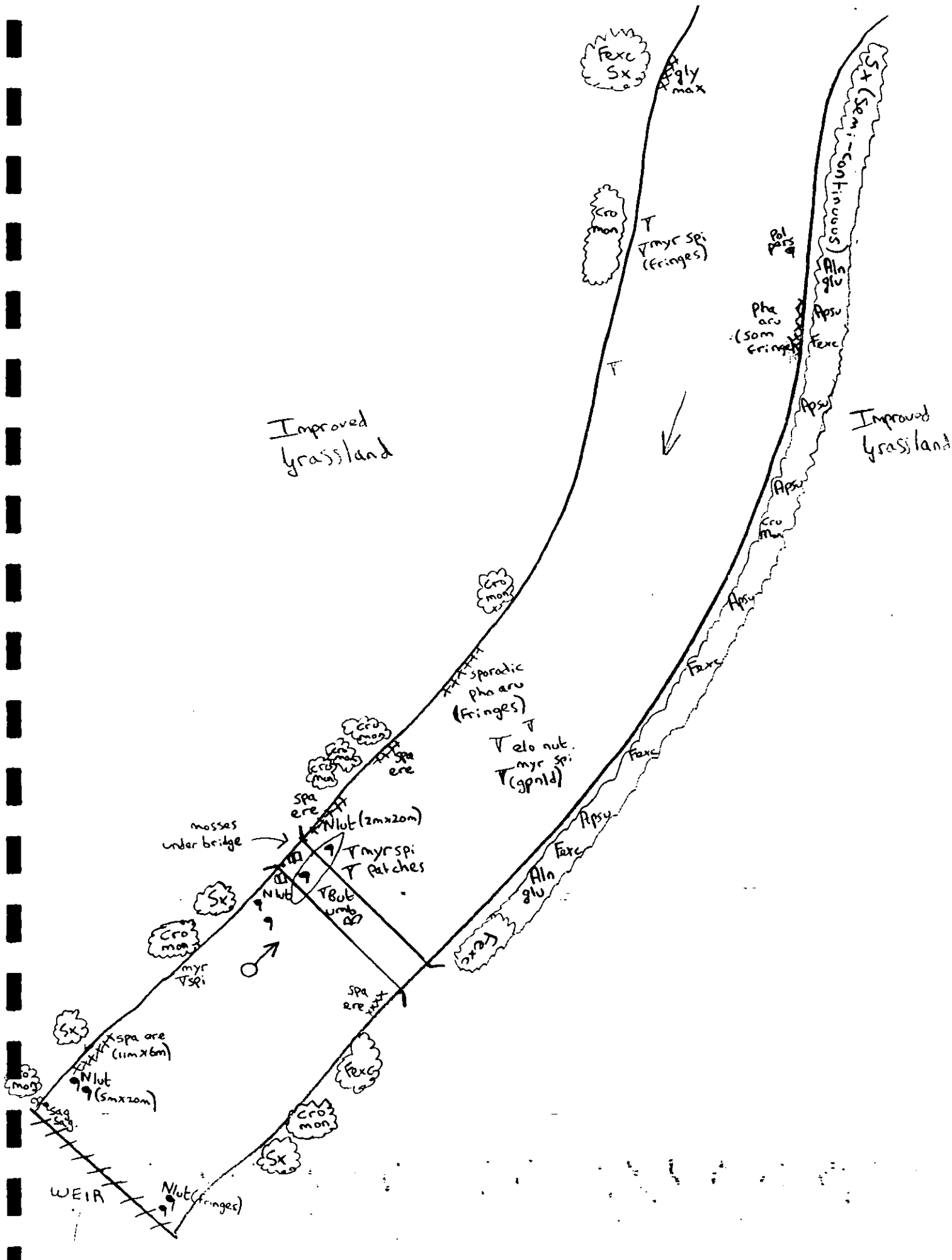


River: Wharfe **Site**: u/s Newton Kyme (17) **NGR**: SE 455457
Date: 9/7/98
Surveyors: MG/PS



River: Wharfe **Site**: u/s Tadcaster Weir (18)

NGR: SE 485439
Date: 9/7/98
Surveyors: MG/PS



Appendix III. Photographs.

Ouse 2. At Beningbrough Hall.

Plate 1. General view looking upstream towards top of section

Plate 2. *Potamogeton pectinatus* community along river fringes.

Ouse 1. Downstream Moor Monkton intake.

Plate 3. General view looking upstream from centre of section.

Plate 4. *Potamogeton pectinatus* community along river fringes.

Ouse 3. At Nether Poppleton

Plate 5. General view of site looking downstream from centre of section.

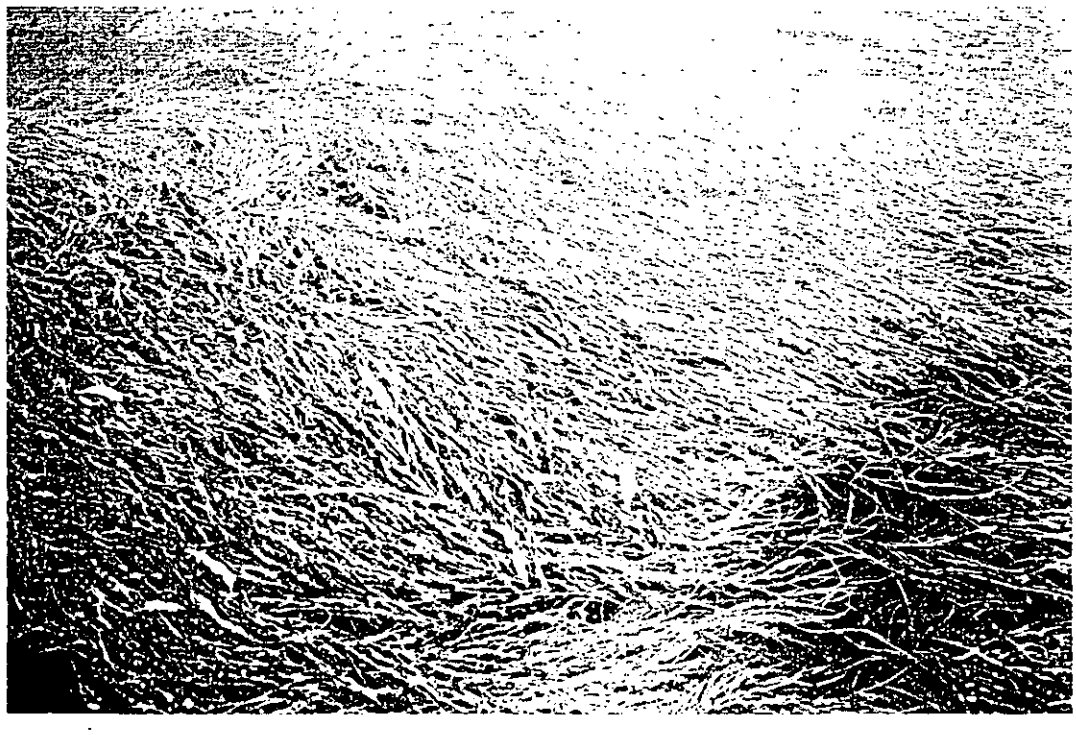


Plate 6. ***Potamogeton pectinatus*** **community along fringes of river**

Ure 1b. Ulshaw.

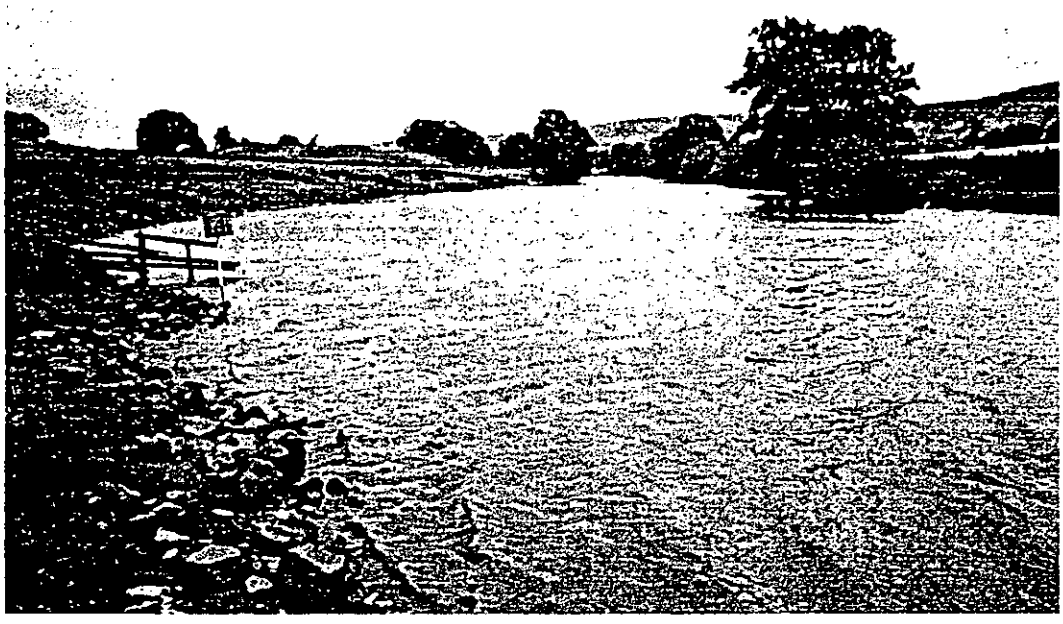


Plate 7. General view of site looking downstream from bend.

Ure 2. Jervaulx.

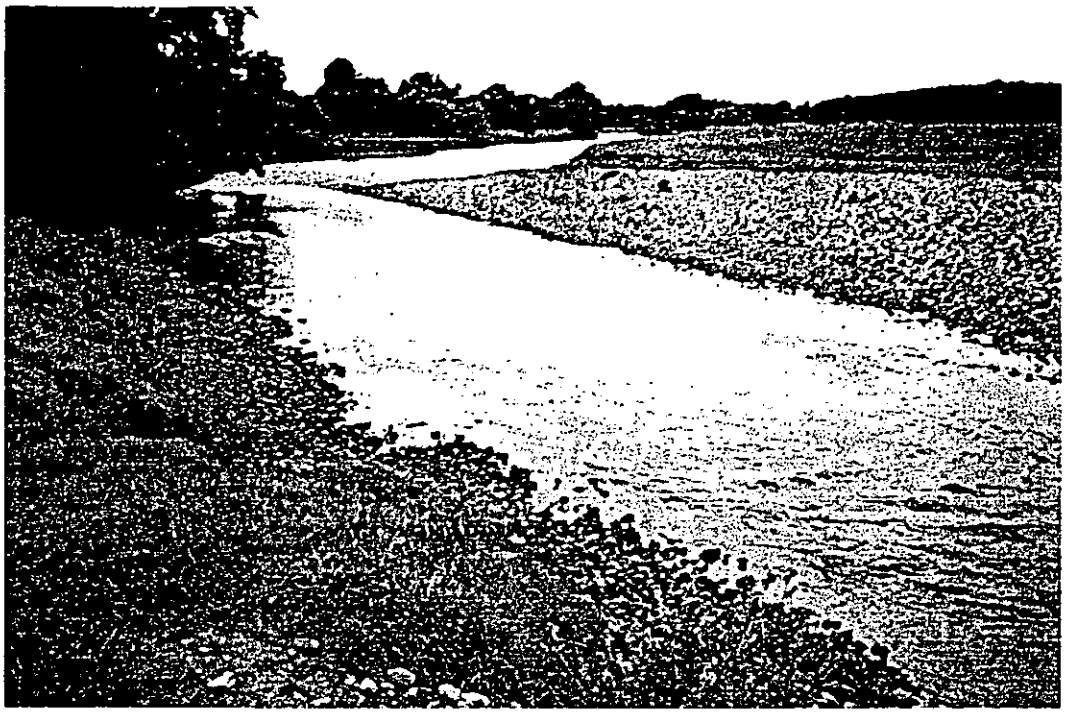


Plate 8. General view of site looking upstream from downstream end.

Plate 9. General view of site looking downstream from top of section.

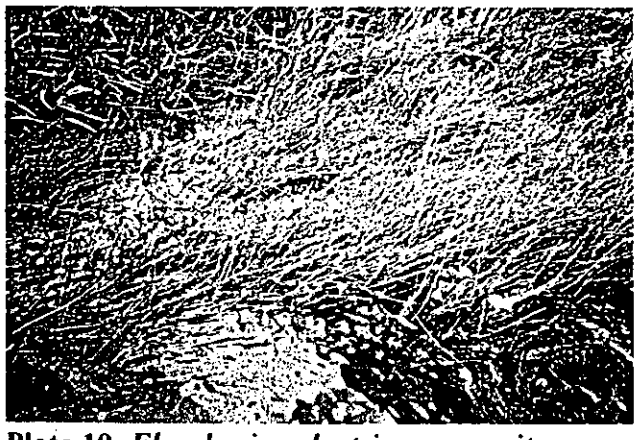


Plate 10. *Eleocharis palustris* community.

Ure 2b. Downstream Kilgram Bridge intake.

Plate 11. General view of site looking downstream from bridge.

Ure 3. Clifton Castle.

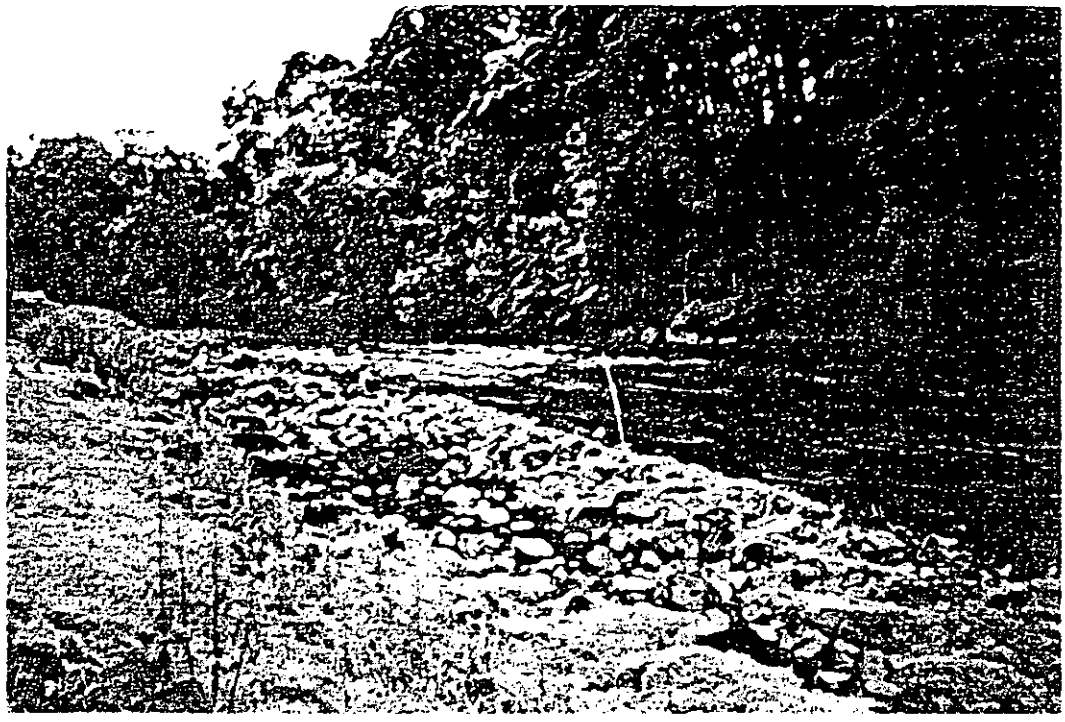


Plate 12. General view looking downstream from top of section.

Ure 9. Aldwark.

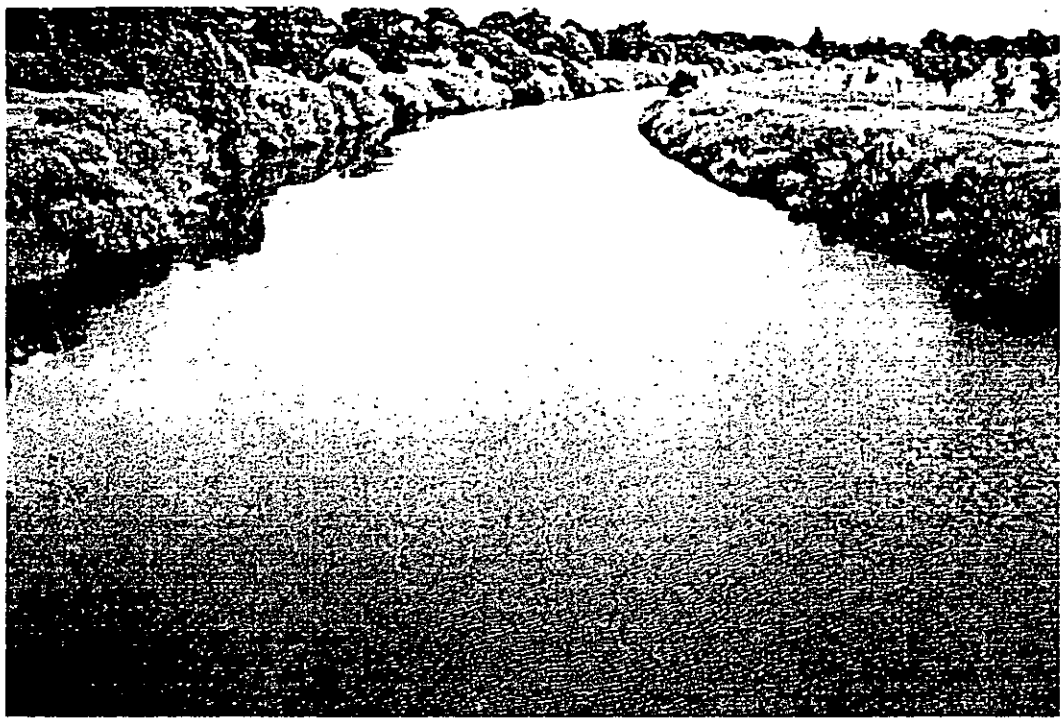


Plate 13. General view of site looking downstream from footbridge.

Wharfe 1. Upstream of Starbotton.

Plate 14. General view of site looking upstream from centre of section.

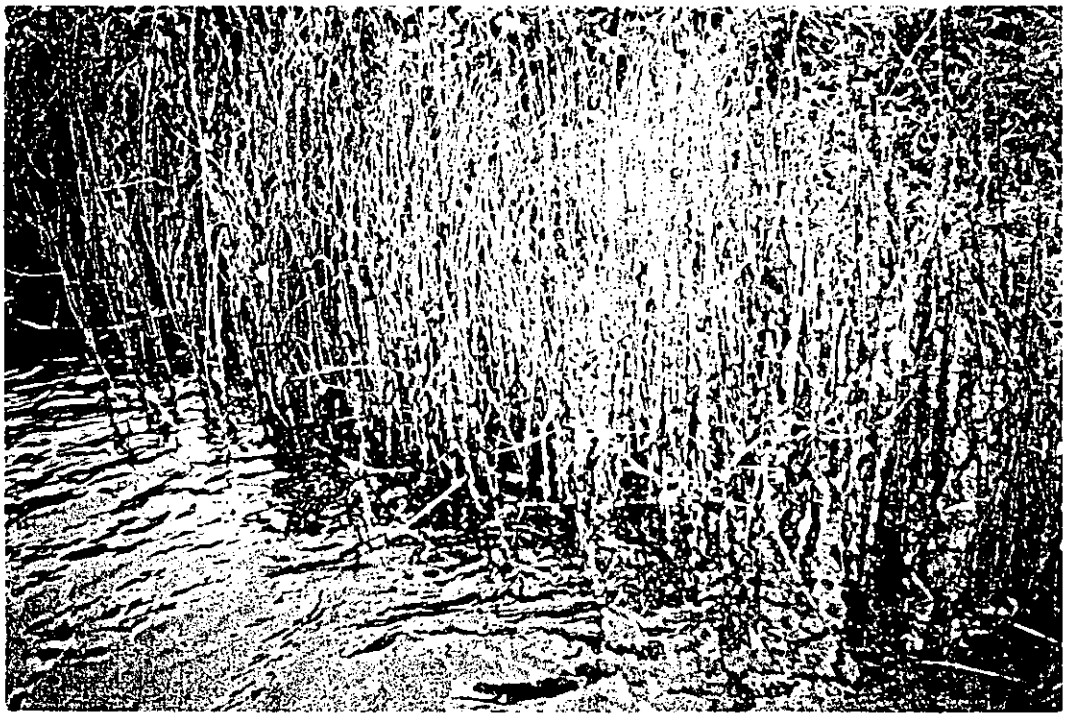


Plate 15. *Eleocharis palustris* community.

Wharfe 2. Downstream Consitone Bridge.

Plate 16. General view of site looking downstream from bridge.

Wharfe 3. Upstream of Hebden.

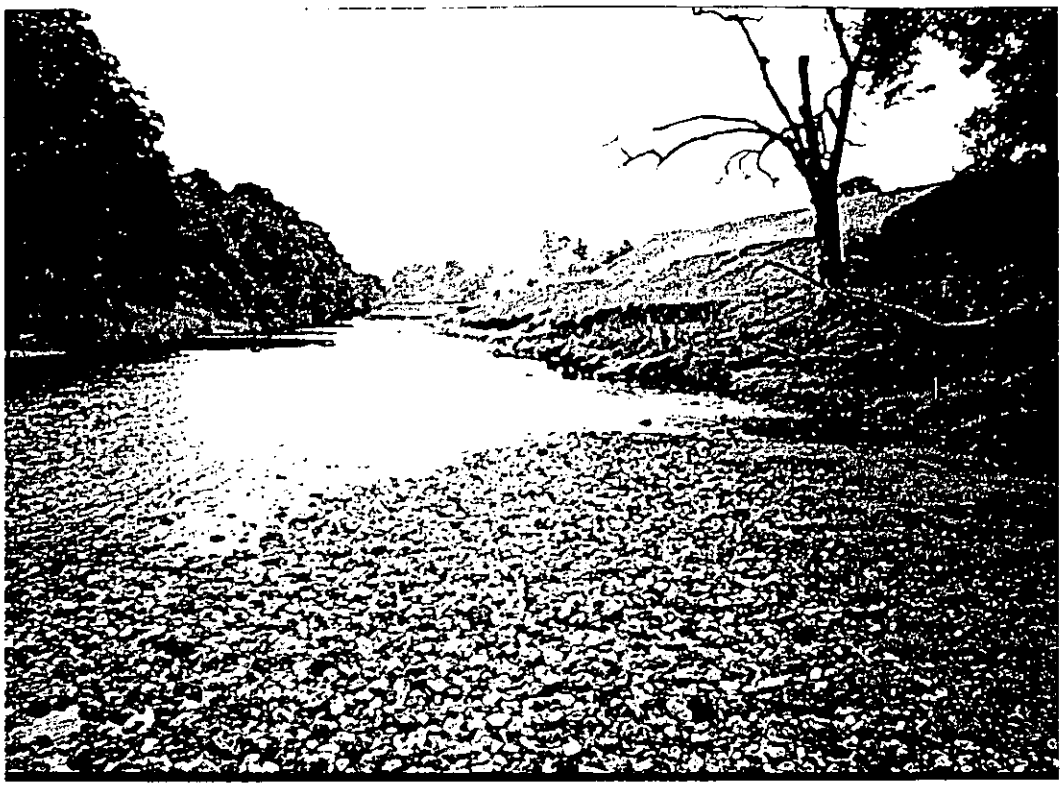


Plate 17. General view of site looking downstream from top of section.

Plate 18. *Carex aquatilis* community.

Wharfe 4. Appletreewick

Plate 19. General view of site looking downstream from bend in river.

Wharfe 5. River Dibb, upstream of Dibbles Bridge

Plate 20. General view of site looking downstream from top of section.

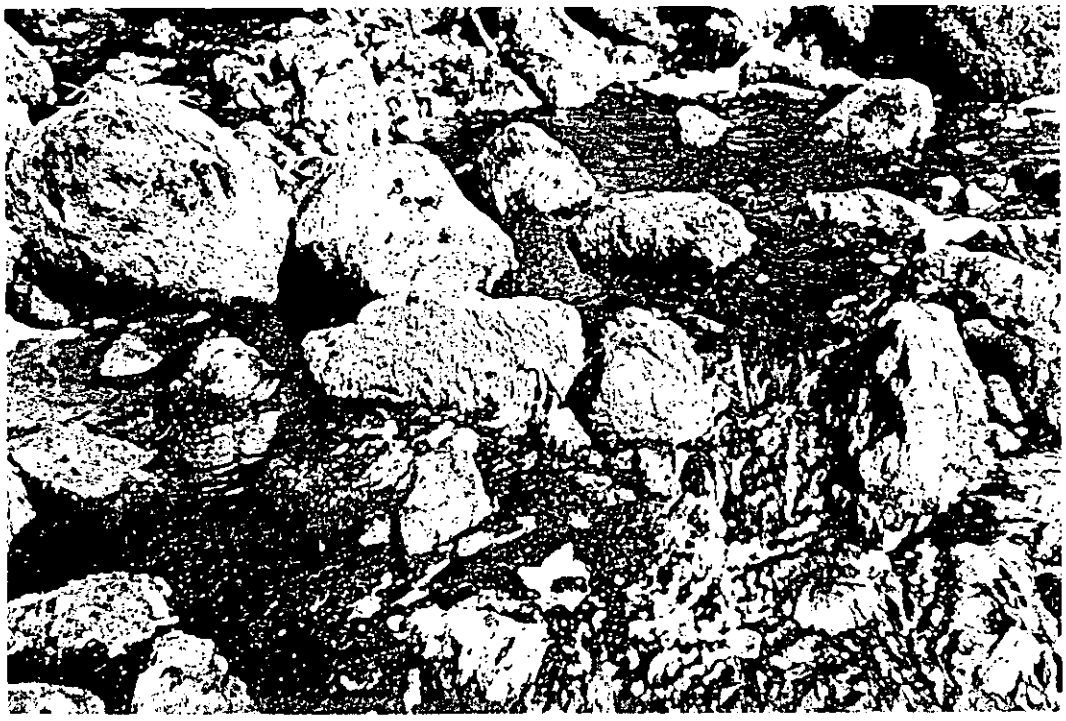


Plate 21. Typical bryophyte community on boulder.

Wharfe 6. Downstream of Strid.

Plate 22. General view of site looking downstream from top of section.

Wharfe 7. Upstream Lobwood.

Plate 23. General view of site looking upstream from right bank.

Wharfe 8. At Addingham, downstream of weir.

Plate 24. General view of site looking upstream from centre of section.

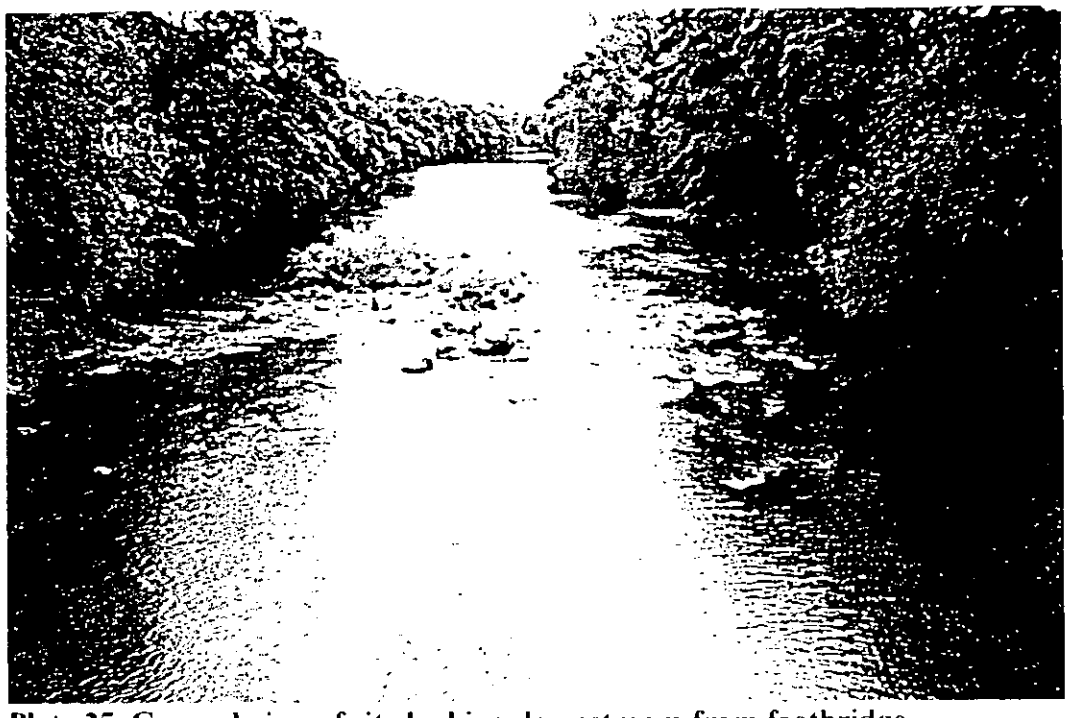


Plate 25. General view of site looking downstream from footbridge.

Wharfe 10. Downstream of Burley.

Plate 26. General view of site looking upstream from bottom of section.

Wharfe 11. Knotford

Plate 27. General view of site looking upstream from centre of section.

Plate 28. General view of site looking downstream from centre of section.

Plate 29. Typical *Myriophyllum spicatum* community with extensive diatom epiphytic growth and silt deposition.

Wharfe 13. The Nunnery.

Plate 30. General view of site looking upstream from bottom.

Plate 31. ***Potamogeton penicillatus*** **community**

Plate 32. ***Myriophyllum spicatum*** **community showing epiphytic diatom growth.**

Wharfe 14. Upstream Collingham.

Plate 33. General view of site looking downstream from centre of section.

Plate 34. Typical *Myriophyllum spicatum* community.

Wharfe 16. Upstream of Woodhall Hotel

Plate 35. General view of site looking upstream from centre of section.

Plate 36. Typical *Myriophyllum spicatum* community.

Wharfe 15. Boston Spa.

Plate 37. General view of site looking downstream from top of site.

Plate 38. Typical *Sparganium erectum* community.

Wharfe 17. Upstream of Newton Kyme

Plate 39. General view of site looking upstream from lower part of section.

Wharfe 18. Upstream of Tadcaster weir.

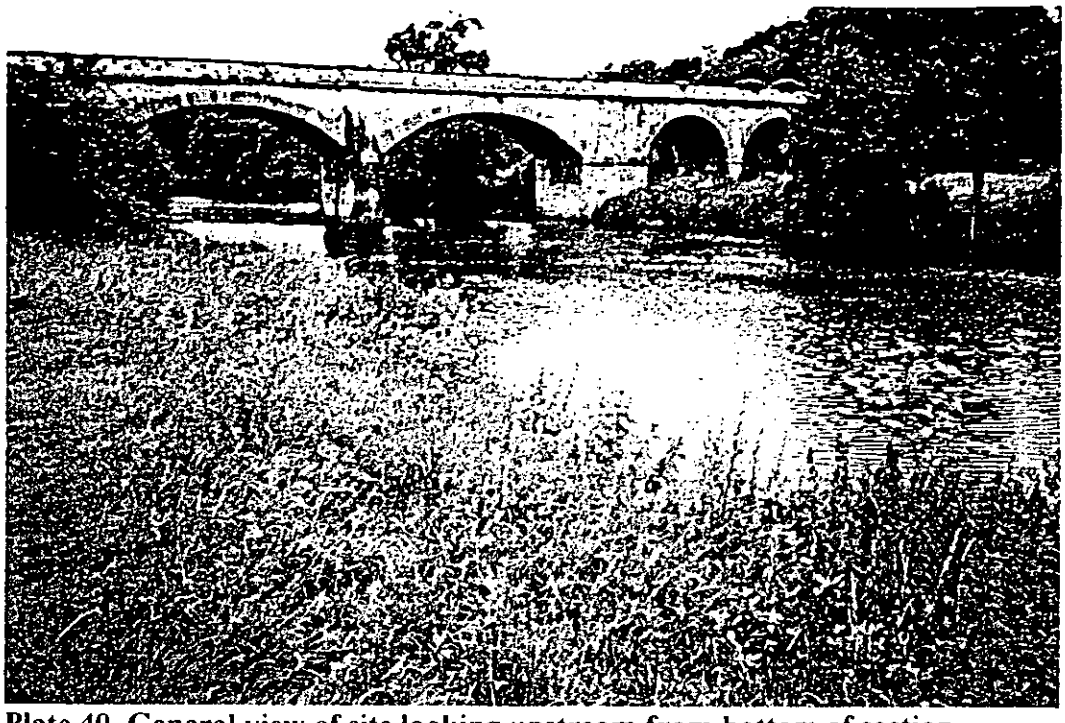


Plate 40. General view of site looking upstream from bottom of section.

Plate 41. ***Nuphar lutea / Sparganium erectum*** **community near weir.**

Appendix IV. Abbreviations used in report.

Abbreviation	Full name
Bry pal	*Bryum pallens*
Bry pse	*Bryum pseudotriquetrum*
Bry sp.	*Bryum* species
Car nig	*Carex nigra*
Cer dem	*Ceratophyllum demersum*
Col flu	*Collema fluviatile*
Des ces	*Deschampsia cespitosa*
Dic pel	*Dichodontium pellucidium*
Ent sp	*Enteromorpha* species
Epi hir	*Epilobium hirsutum*
Fis sp.	*Fissidens* species
Jun art	*Juncus articulatus*
Lem min	*Lemna minor*
Lys vul	*Lysimachia vulgaris*
Mar pol	*Marchantia polymorpha*
Men spi	*Mentha spicata*
Mim gut	*Mimulus guttatus*
Mni sp.	*Mnium* species
Myo sp	*Myosotis* species
Nas off	*Nasturtium officinale*
Nup lut	*Nuphar lutea*
Pel end	*Pellia endivifollia*
Per amp	*Persicaria amphibia*
Pla ros	*Plagiomnium rostratum*
Pol amp	*Polygonum amphibium*
Pot per	*Potamogeton perfoliatus*
Pot sue	*Potamogeton* x *suecicus*
Ran cal	*Ranunculus penicillatus* subsp. *pseudofluitans*
Ran pen	*Ranunculus penicillatus* subsp. *penicillatus*
Ror isl	*Rorippa islandica*
Ror nas aqu	*Rorippa nasturtium aquaticum*
Ror syl	*Rorippa sylvestris*
Scr aqu	*Scrophularia aquatica*
Scr aur	*Scrophularia auriculata*
Spa ere	*Sparganium erectum*
Tha alo	*Thamnobryum alopecorum*
Ver ana	*Veronica anagalis aquatica*
Ver bec	*Veronica beccabunga*
Verr sp.	*Verrucaria* species

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