



## Macroinvertebrate and fish population surveys in six New Forest streams, September 2020

Higher Level Stewardship Agreement

The Verderers of the New Forest AG00300016

November 2020



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## EXECUTIVE SUMMARY

Wetland restoration in the New Forest has been undertaken since the late 1990s. The current programme of works, under the Higher Level Stewardship scheme's main objectives, is to bring the New Forest riverine and wetland habitat to Favourable Condition, in accordance with its statutory designation as a Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC).

This data report summarises the findings of 12 electric fishing surveys and 21 macroinvertebrate surveys at 22 locations (in six different streams / wetland habitats).

Surveys were undertaken at Dames Slough (Blackwater), Ferny Croft (Beaulieu River tributary), Latchmore Brook, Millersford Brook, Pondhead (Beaulieu River tributary) and Redhill/Holmhill (Ober Water).

Key findings are presented below:

### FISH POPULATION SURVEYS

Table 1 summarises the fish species recorded at each location.

**Table 1. Species recorded at each location (in numerical abundance order).**

Location	Year restoration undertaken / planned	Fish species recorded
Dames Slough 1	2005	Minnow, R/B lamprey, stone loach, bullhead, chub, brown trout, pike
Dames Slough 2	2005	Minnow, stone loach, bullhead, chub, R/B lamprey, pike, eel, brown trout
Latchmore Brook Site 1	No plan to restore	Minnow, chub, stone loach, dace, perch, roach, eel, pike
Latchmore Brook Site 2	No plan to restore	Minnow, chub, stone loach, brown trout, eel, roach
Latchmore Brook Site 3	No plan to restore	NOT SURVEYED – LOW / NO FLOW
Latchmore Brook Site 4	No plan to restore	Minnow, roach
Millersford Bottom Site 1		NO FISH
Millersford Bottom Site 2	No plan to restore	Brown trout, eel
Millersford Bottom Site 3	No plan to restore	Brown trout
Millersford Fish Site 1		NO FISH
Pondhead Site 1	2018	Stone loach, bullhead, R/B lamprey, minnow, brown trout, 3-spined stickleback, roach eel
Pondhead Site 2	2018	Bullhead, stone loach, minnow, 3-spined stickleback, brown trout, R/B lamprey
Pondhead Control	No plan to restore	3-spined stickleback, bullhead, stone loach, brown trout, eel

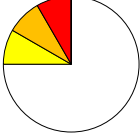
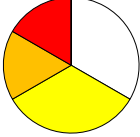
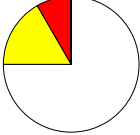
## MACROINVERTEBRATE SURVEYS

A total of 12 different biotic indices were used to calculate impact classes based on the Observed/Expected ratios. Table 2 presents the proportion of Observed/Expected ratios (n=12) within each impact category at each location.

**Table 2. Proportion of biotic indices Observed/Expected ratios (n=12) within each impact category at each location. Colour key: Blue = Better than expected, White = Within expected range, Yellow = Slightly degraded, Orange = Moderately degraded, Red = Very degraded.**

Location	Year restoration undertaken / planned	Proportion of Observed / Expected ratios in each impact class
Dames Slough 1	2005	
Dames Slough 2	2005	
Ferry Croft Control	No plan to restore	
Ferry Croft Impact	2017 and 2018	
Latchmore Site 1	No plan to restore	
Latchmore Downstream	No plan to restore	
Latchmore Upstream 2	No plan to restore	
Latchmore Control	No plan to restore	

Location	Year restoration undertaken / planned	Proportion of Observed / Expected ratios in each impact class
Latchmore Upstream	No plan to restore	
Thompson Castle Downstream	No plan to restore	
Thompson Castle Upstream	No plan to restore	
Millersford Brook 1	No plan to restore	
Millersford Brook 2	No plan to restore	
Millersford Brook 3	No plan to restore	
Millersford Control	No plan to restore	
Millersford Upstream Control	No plan to restore	
Pondhead Downstream	2018	
Pondhead Control	No plan to restore	

Location	Year restoration undertaken / planned	Proportion of Observed / Expected ratios in each impact class
Redhill / Holmhill Control	No plan to restore	
Redhill / Holmhill Downstream	No plan to restore	
Redhill / Holmhill Upstream	No plan to restore	

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## 1. INTRODUCTION

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The New Forest HLS scheme objectives are to restore resectioned channels to their historic meanders to prevent further erosion of the specialist mire / wet heath habitats, increase the availability of in-channel habitat and reconnect the floodplain, with a view to bringing the SSSI units back into Favourable Condition according to their conservation objectives. The scheme is a catchment-based approach of naturalising and sustaining the landscape into the future, maintaining grazing and the complex biodiversity of the New Forest open habitats.

Geo- and hydromorphological restoration of flowing water bodies are widely regarded as being of positive environmental benefit; however, this can be difficult to justify to local land owners, interest groups and other organisations without sound supporting evidence. This project has been designed to focus specifically on freshwater fish and macroinvertebrate communities as indicators of in-stream ecological quality and to detect whether any temporal changes in community structure (positive or negative) can be attributed to the physical re-engineering of stream profiles.

This data report summarises the findings of 12 electric fishing surveys and 21 macroinvertebrate surveys at 22 locations (in six different streams / wetland habitats).

Surveys were undertaken at Dames Slough (Blackwater), Ferny Croft (Beaulieu River tributary), Latchmore Brook, Millersford Brook, Pondhead (Beaulieu River tributary) and Redhill/Holmhill (Ober Water).

### 1.1 Aims and objectives

The specific aims and objectives of this report are as follows:

- Provide fish and macroinvertebrate survey data for the selected New Forest streams.
- Highlight any rare species afforded conservation protection under the following designations:
  - Schedule 5 Wildlife and Countryside Act (1981) Species
  - Red Data Book Species
  - UK BAP Priority Species
  - Nationally and Regionally Scarce Species

## 2. METHODOLOGY

### 2.1 Site selection

In advance of the surveys being undertaken, Forestry Commission provided BUG with National Grid Reference (NGR) coordinates for the upstream and downstream extent of each fish survey site and the NGR of each macroinvertebrate survey site (Table 2.1). The location of each stream surveyed was mapped in ArcGIS, to provide an overview of the location of each area of interest in relation to the wider New Forest area (Figure 2.1).

**Table 2.1. Location of fish and invertebrate sites and dates surveyed.**

Site name	Upstream limit	Downstream limit	Fish survey	Invert survey	Survey date
Dames Slough 1	SU2412605034	SU2419405024	✓		15/09/2020
Dames Slough 2	SU2500905019	SU2509104985	✓		15/09/2020
Dames Slough 1	SU2419405024	N/A		✓	15/09/2020
Dames Slough 2	SU2509104985	N/A		✓	15/09/2020
Ferny Croft Control	SU3774405555	N/A		✓	17/09/2020
Ferny Croft Impact	SU3797705418	N/A		✓	17/09/2020
Latchmore 1	SU1908112649	SU1899312648	✓		10/09/2020
Latchmore 2	SU1826712470	SU1817712443	✓		10/09/2020
Thompson Castle Upstream	SU1847713063	N/A		✓	10/09/2020
Thompson Castle Downstream	SU1852712720	N/A		✓	10/09/2020
Latchmore Downstream	SU1826712470	N/A		✓	10/09/2020
Latchmore Site 1	SU1908112649	N/A		✓	10/09/2020
Latchmore 3	SU2154814036	SU2146013970	X		N/A – no flow
Latchmore 4	SU2203714235	SU2195014290	✓		11/09/2020
Latchmore Upstream 2	SU2154814036	N/A		✓	11/09/2020
Latchmore Control	SU2203714235	N/A		✓	11/09/2020
Latchmore Upstream	SU2273815944	N/A		✓	11/09/2020
Millersford Bottom Site 1	SU1951816719	SU1944816766	✓		11/09/2020
Millersford Bottom Site 2	SU1838416240	SU1831216191	✓		14/09/2020
Millersford Bottom Site 3	SU1907116841	SU1897816825	✓		14/09/2020
Millersford Fish Site 1	SU1956517527	SU1953917437	✓		14/09/2020
Millersford Brook 1	SU1956517527	N/A		✓	14/09/2020
Millersford Brook 2	SU1831216191	N/A		✓	14/09/2020
Millersford Brook 3	SU1907116841	N/A		✓	14/09/2020
Millersford Control	SU1951816719	N/A		✓	11/09/2020
Millersford Upstream Control	SU2030017866	N/A		✓	14/09/2020
Pondhead Site 1	SU3242706944	SU3250406973	✓		16/09/2020
Pondhead Site 2	SU3234006861	SU3240206908	✓		16/09/2020
Pondhead Control	SU3087707665	SU3096007610	✓		17/09/2020
Pondhead Downstream	SU3240206908	N/A		✓	16/09/2020

Site name	Upstream limit	Downstream limit	Fish survey	Invert survey	Survey date
Pondhead Control	SU3087707665	N/A		✓	17/09/2020
Redhill / Holmhill Upstream	SU2687702294	N/A		✓	17/09/2020
Redhill / Holmhill Downstream	SU2706902666	N/A		✓	17/09/2020
Redhill / Holmhill Control	SU2681902262	N/A		✓	17/09/2020
<b>TOTAL NUMBER OF SITES</b>			<b>12 Fish</b>	<b>21 Inverts</b>	

Further details on each survey site are provided in Sections 2.1.1 to 2.1.6 below. A more detailed description of fish survey site characteristics is provided within the introduction to each site in the results Section 3.

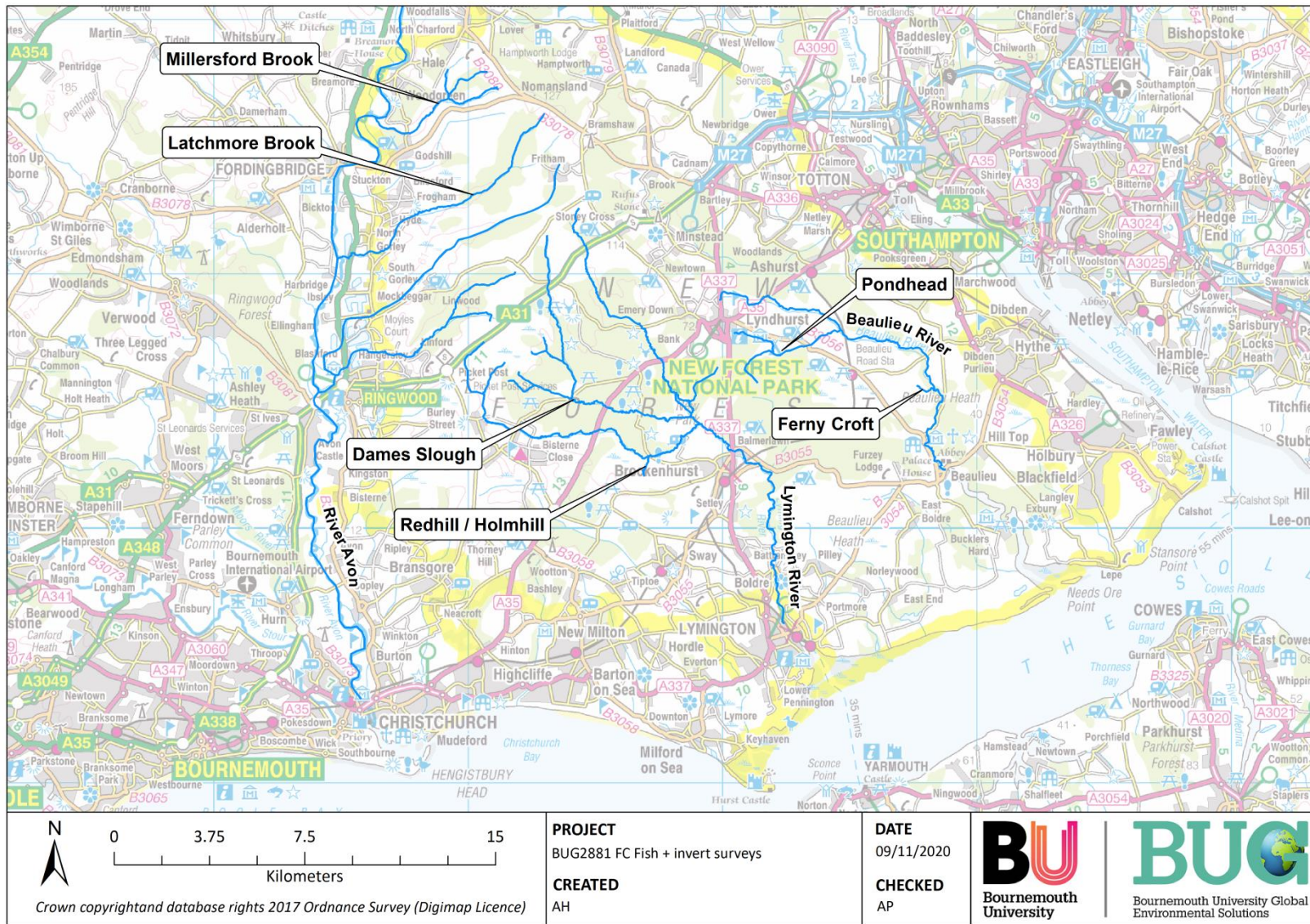
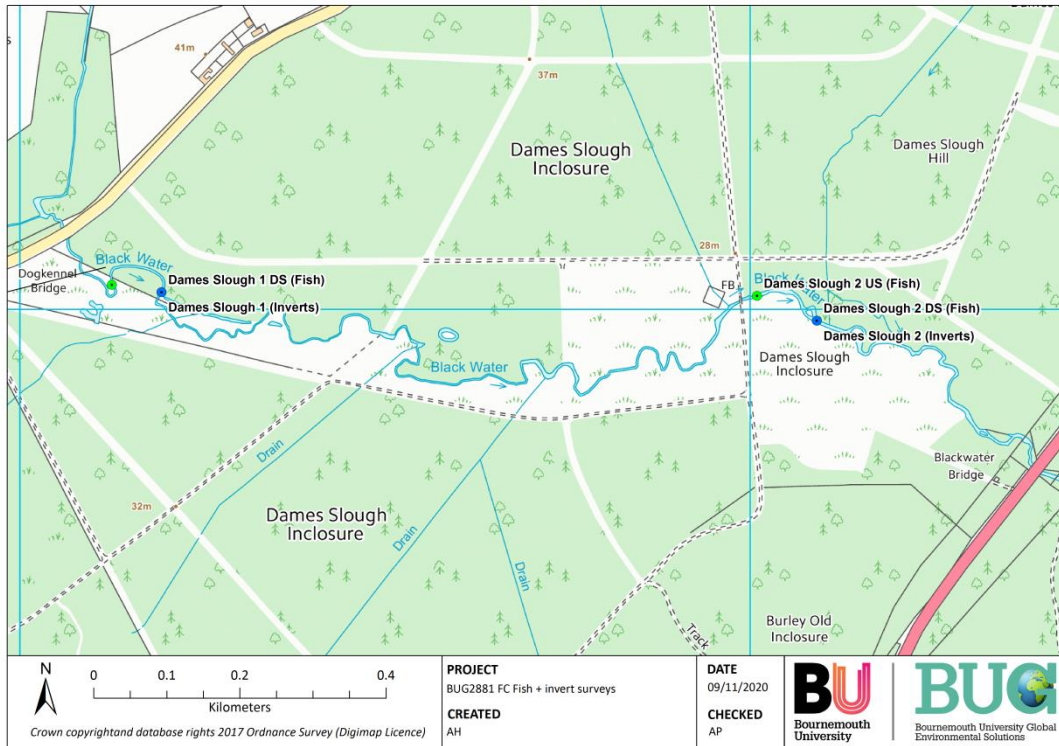


Figure 2.1. Location of each of the six streams surveyed during 2020.

### 2.1.1 Dames Slough

Dames Slough is located on the Blackwater, a small tributary of the Lymington River (Figure 2.1). The upstream and downstream extents of the 100 m electric fishing sites (green dots) and invertebrate kick-sampling sites (blue dots) are shown in Figure 2.2 and summarised in Table 2.1. Full descriptions of the fish survey sites are provided within the results Sections 3.1 and 3.2.



**Figure 2.2. Location of survey sites at Dames Slough. Green = fish survey sites, blue = invertebrate survey sites.**

### 2.1.2 Ferny Croft

Ferny Croft is located on a small tributary of the Beaulieu River (Figure 2.1). The location of the two macroinvertebrate sampling sites are shown in Figure 2.3 and summarised in Table 2.1.

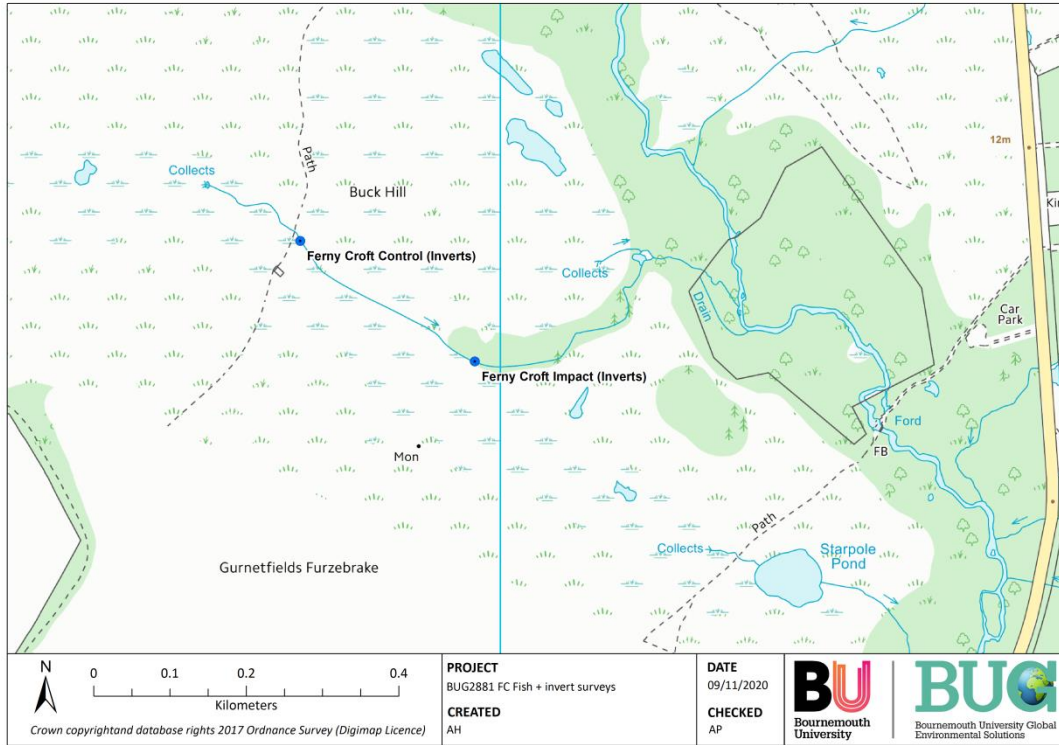


Figure 2.3. Location of survey sites at Ferny Croft.



### 2.1.3 Latchmore Brook

Latchmore Brook (changing downstream to Huckles Brook) is a small tributary of the River Avon (Figure 2.1). The upstream and downstream extents of the 100 m electric fishing sites (green dots) and the invertebrate kick-sampling sites (blue dots) are shown in Figure 2.4 and Figure 2.5 and summarised in Table 2.1. A full description of the fish survey sites are provided within the results Sections 3.3 to 3.6.

Note: Latchmore 3 fish survey was not completed due to lack of flow at the time of the survey.

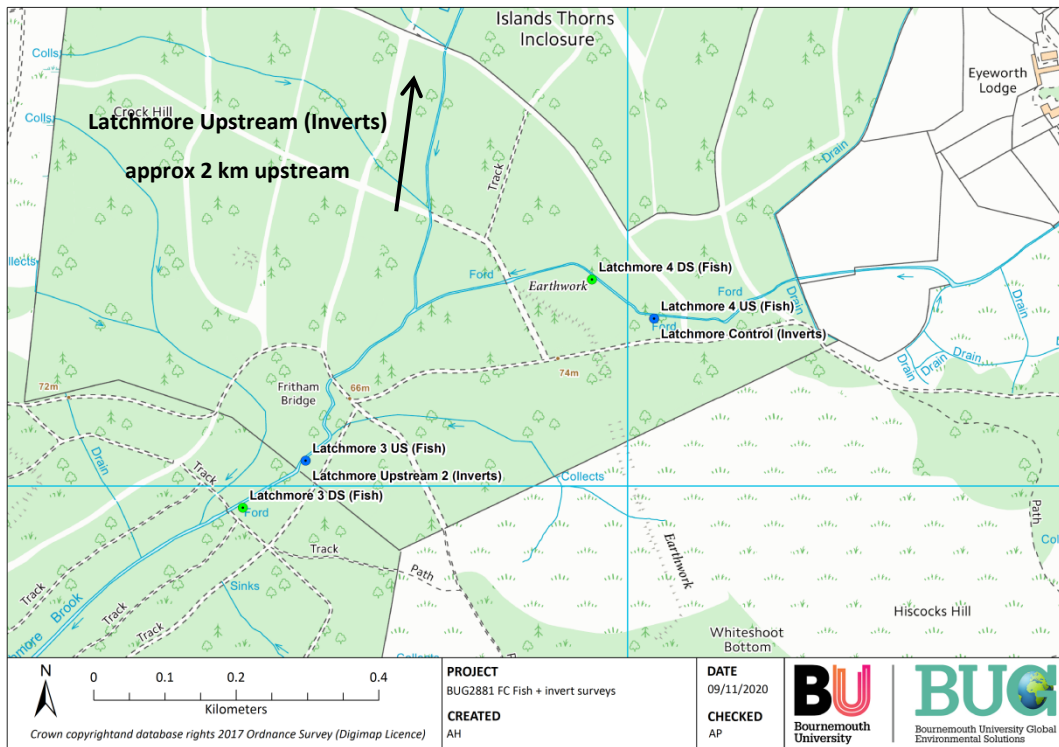
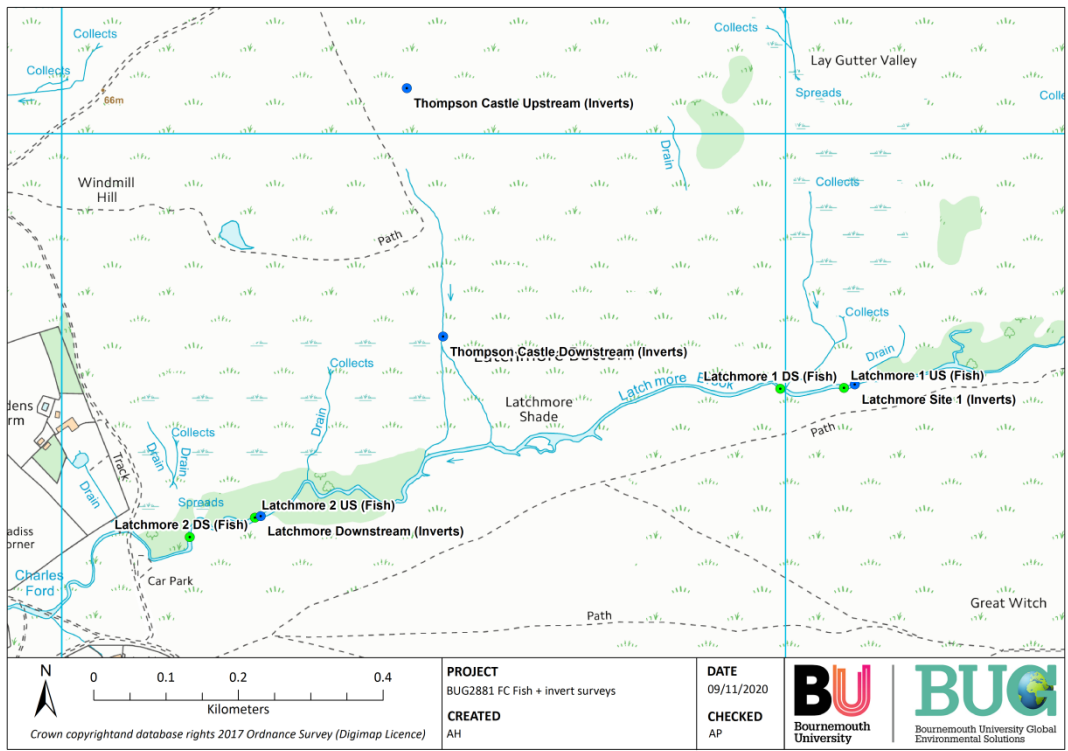


Figure 2.4. Location of survey sites at Latchmore Brook (upstream stretch). Green = fish survey sites, blue = invertebrate survey sites.



**Figure 2.5. Location of survey sites at Latchmore Brook (downstream stretch). Green = fish survey sites, blue = invertebrate survey sites.**

### 2.1.4 Millersford Brook

Millersford Brook is a tributary of the River Avon (Figure 2.1). The upstream and downstream extents of the four 100 m electric fishing sites (green dots) and five invertebrate kick-sampling sites (blue dots) are shown in Figure 2.6 and Figure 2.7 and summarised in Table 2.1. Full descriptions of the fish survey sites are provided within the results Sections 3.7 to 3.10.

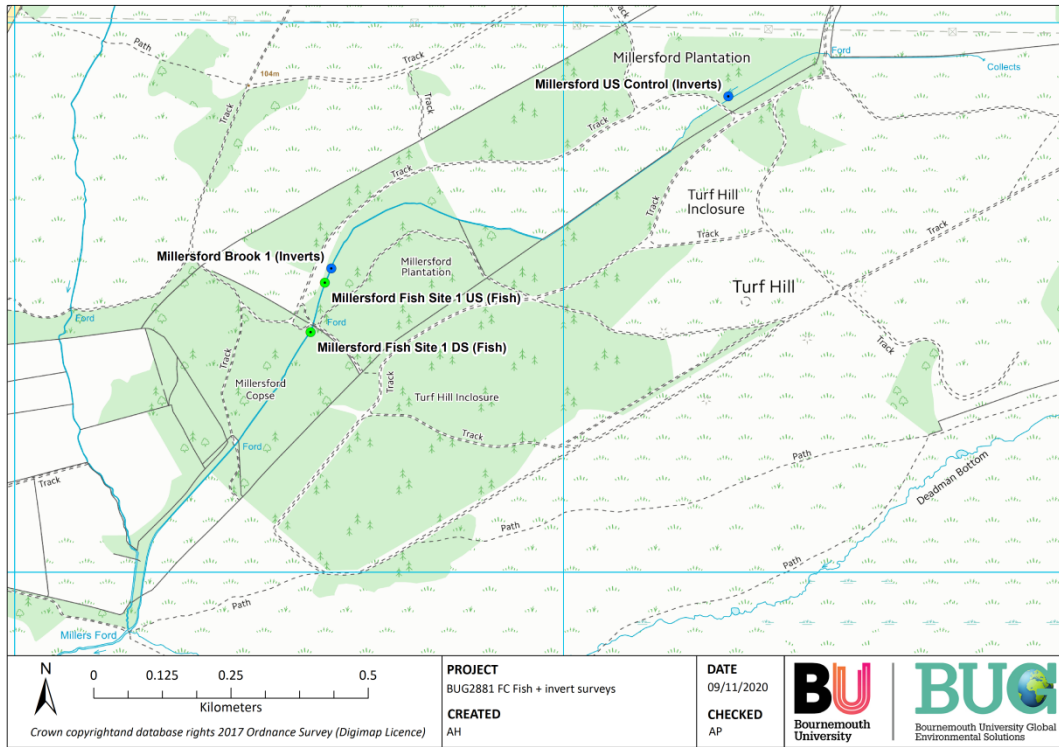
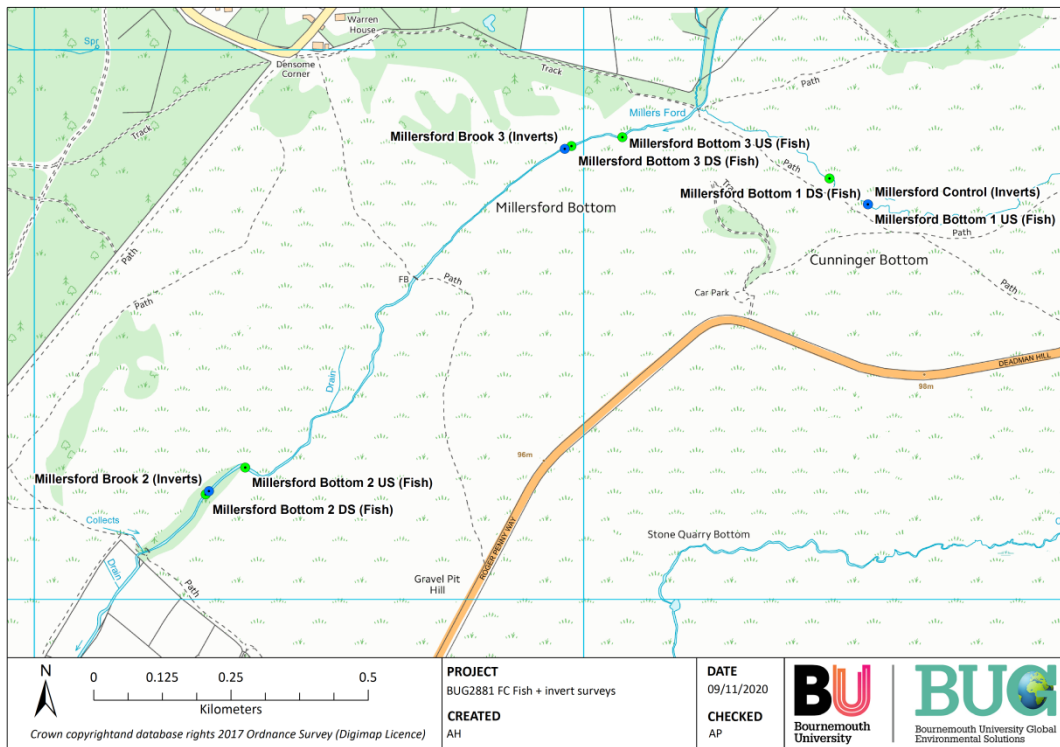


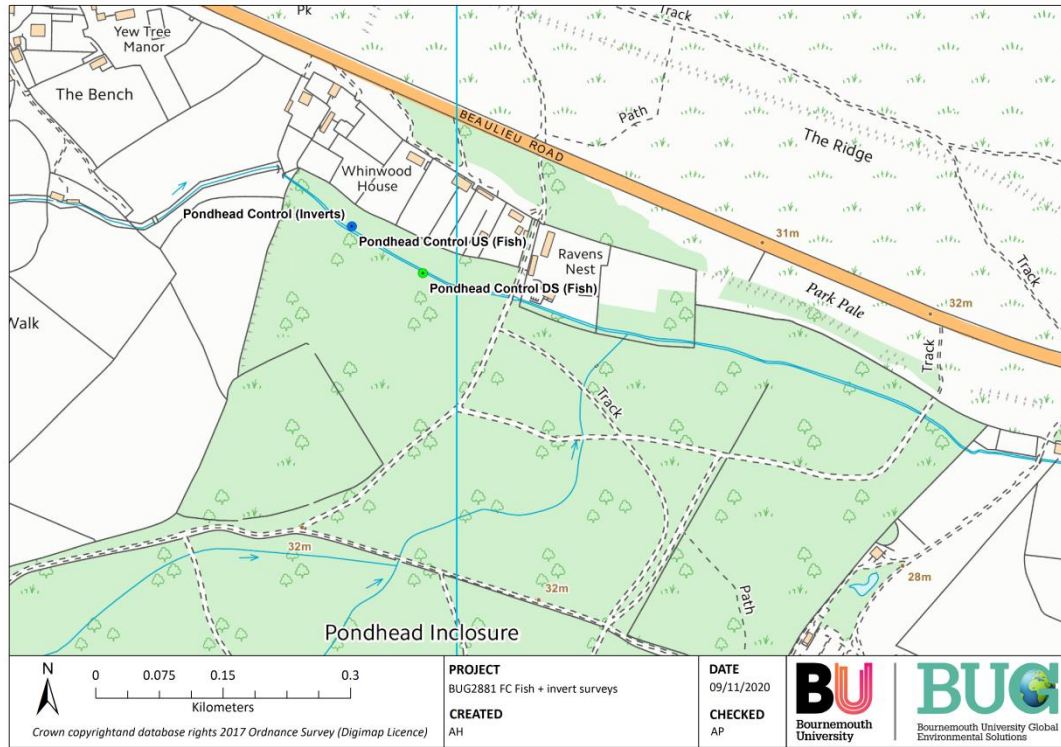
Figure 2.6. Location of survey sites at Millersford Brook (upstream stretch). Green = fish survey sites, blue = invertebrate survey sites.



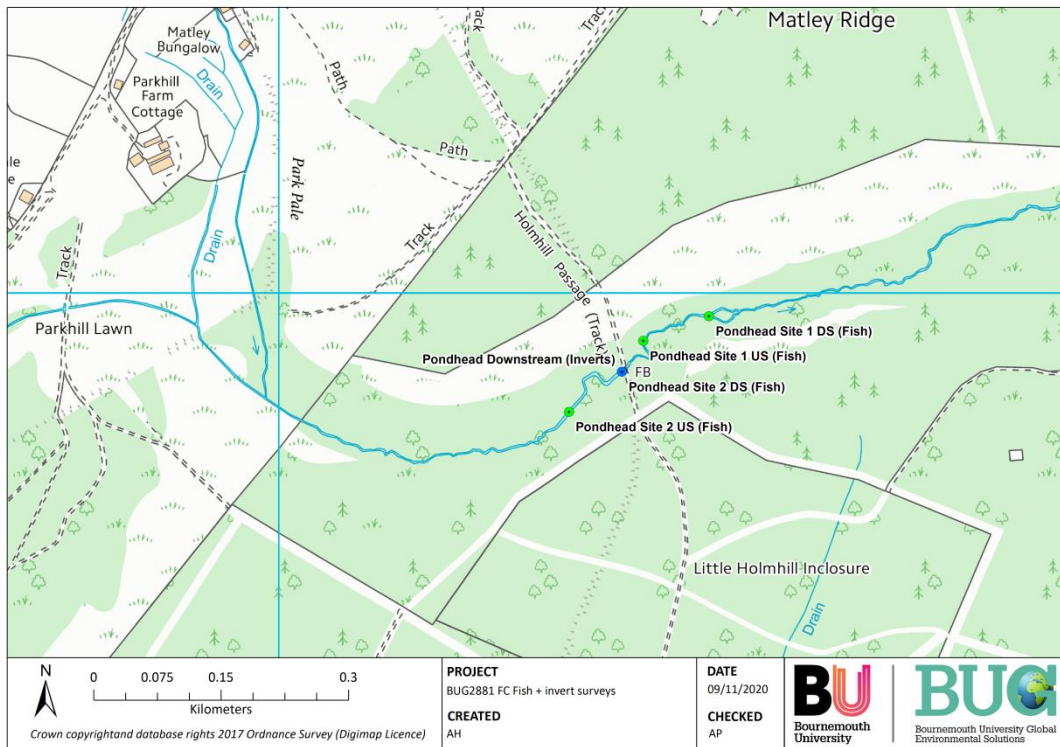
**Figure 2.7. Location of survey sites at Millersford Brook (downstream stretch). Green = fish survey sites, blue = invertebrate survey sites.**

### 2.1.5 Pondhead

Pondhead is located on a small tributary of the Beaulieu River (Figure 2.1). The upstream and downstream extents of the 100 m electric fishing sites (green dots) and the invertebrate kick-sampling sites (blue dots) are shown in Figure 2.8 and Figure 2.9 and summarised in Table 2.1. A full description of the fish survey sites are provided within the results Sections 3.11 and 3.12.



**Figure 2.8. Location of survey sites at Pondhead (upstream stretch). Green = fish survey sites, blue = invertebrate survey sites.**



**Figure 2.9. Location of survey sites at Pondhead (downstream stretch). Green = fish survey sites, blue = invertebrate survey sites.**

### 2.1.6 Redhill / Holmhill

Redhill / Holmhill is located on a small tributary of Ober Water, which flows into the Lymington River (Figure 2.1). The location of the three macroinvertebrate sampling sites are shown in Figure 2.10 and summarised in Table 2.1.

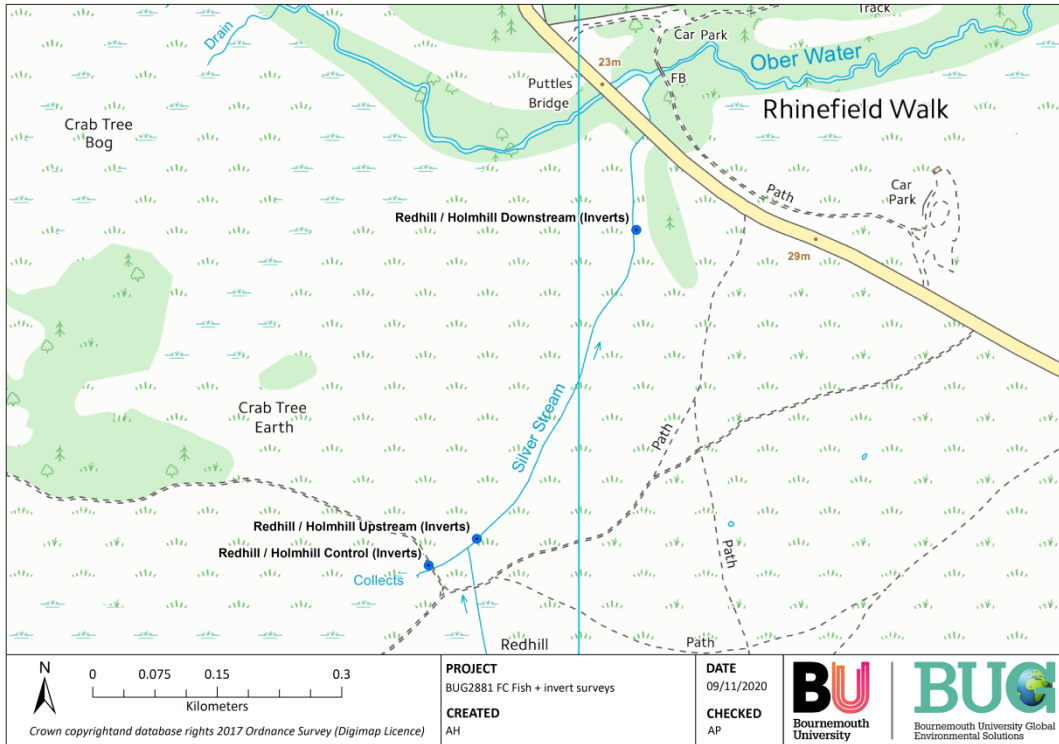


Figure 2.10. Location of survey sites at Redhill / Holmhill.

## 2.2 Electric fishing

At each site, a fully-quantitative (triple run) electric fishing survey was conducted using backpack electric fishing kit. Stop-nets were positioned at both the upstream and downstream extent of the survey site to isolate a 100 m stretch (where possible). In combination with measurement of river habitat characteristics at 10 m intervals (e.g. width, depth and substrate), the total survey area was calculated for each site.

All fish captured were identified to species, a representative sub-sample of each species was measured, and all fish allowed to recover in aerated holding tanks prior to their release. Fish from each electric fishing run were processed separately to facilitate calculation of population densities using catch depletion models.

Fish capture, processing, data recording and analyses was completed in accordance with best practice guidance (e.g. Joint Nature Conservation Committee Common Standards Monitoring).

Where relevant, 0+ and 1++ brown trout densities were classified according to the National Fisheries Classification Scheme (NFCS), shown in Table 2.2 below.

**Table 2.2. National Fisheries Classification Scheme for brown trout.**

Classification	Density (No./100m <sup>2</sup> )	
	Trout fry (0+)	Trout parr (1++)
A (Excellent)	>= 38	>= 21
B (Good)	17 – 37.9	12 – 20.9
C (Fair)	8 – 16.9	5 – 11.9
D (Fair / Poor)	3 – 7.9	2 – 4.9
E (Poor)	< 3	< 2
F (Fishless)	Absent	Absent

## 2.3 Invertebrate kick-sampling

### 2.3.1 Survey methodology

Macroinvertebrate samples were collected in accordance with the standard Environment Agency (EA) three-minute kick sampling procedure using a 1 mm mesh pond net (set out in *‘Procedures For Collecting and Analysing Macroinvertebrate Samples’*. BT001 3.0, Third Issue; 1991) and by the procedure for collecting and analysing macroinvertebrate samples for RIVPACS (Murray-Bligh *et al.* 1992).

At each sampling site, a basic suite of physico-chemical parameters (pH, temperature, conductivity, dissolved oxygen) and general habitat characteristics (water velocity category, width, depth and substratum composition) were recorded on standard RIVPACS/RICT *‘Sample Area’* forms. These variables are useful both for describing the general sampling site characteristics, and also as predictor variables for running the RIVPACS (River Invertebrate and Prediction and Classification System) model (see Section 2.3.5).



All samples were accompanied by a GPS reading, and sampling site sketch map to facilitate subsequent return to the same location for re-survey work. In addition, the presence of aquatic macrophytes and other species observed incidentally during the macroinvertebrate sampling (e.g. fish) were also recorded.

All sampling equipment, chemical analysis probes and personal protective equipment had been thoroughly dried prior to visiting the site and all equipment was checked for foreign species, as recommended by the GB Non-Native Species Secretariat 'Check, Clean, Dry' campaign (GB NNSS 2015). As an additional precaution, all equipment that might come into contact with the sampling sites was sprayed with 'Virkon® S' (DuPont™) a powerful broad-spectrum virucidal, bactericidal and fungicidal disinfectant prior to visiting the sampling sites to prevent the transfer of crayfish plague or other pathogens.

Macroinvertebrate samples were fixed at the riverbank using 4% formaldehyde. The use of formaldehyde is considered superior to 70% Industrial Methylated Spirits due to its more rapid and thorough fixation of organic matter and the greatly enhanced shelf life of the samples and the invertebrate specimens they contain. Sample pots were clearly labelled both internally, using pencil and waterproof paper labels, and externally using a waterproof bullet marker. Samples were returned to the laboratory for processing.

### 2.3.2 Laboratory sample processing

Macroinvertebrate samples were sorted, identified and enumerated following the procedures set out in 'Procedures For Collecting and Analysing Macroinvertebrate Samples'. BT001 3.0, Third Issue; (1991)' and by the procedure for collecting and analysing macroinvertebrate samples for RIVPACS (Murray-Bligh *et al.* 1992). Samples were processed to species-level, specifically RIVPACS Taxonomic Level 'TL5' (Davy-Bowker *et al.* 2010), and numerical abundances of all taxa were estimated and recorded on laboratory sample data sheets.

Examination of picked invertebrates was made using a binocular/compound microscope, as required. Appropriate taxonomic keys were used for identification, making reference to a reference collection, where necessary. All samples were reconstituted (put back into their original sample pots and re-preserved) and retained for subsequent quality assurance purposes. Where any specimens were retained for addition to a reference collection, this was clearly marked on the laboratory sample analysis sheets. All sample analyses were carried out by John Davy-Bowker.

### 2.3.3 Data entry and validation

Macroinvertebrate data from sample analysis laboratory datasheets were entered into a Microsoft® Access data entry database. Following data entry, sample validation reports (lists of entered species names and abundances) were printed out and manual data validation checks were performed to ensure that no errors arose due to data entry. Any data entry errors were corrected and the validation process was repeated until the data were error-free. Following validation, data were then exported for the calculation of biotic indices and RIVPACS/RICT Observed/Expected ratios.

### 2.3.4 Calculation of biotic indices

Data were imported into a Microsoft® Access database containing queries for the automatic calculation of a wide range of freshwater macroinvertebrate biotic indices at family and/or species levels.

Further information on the biotic indices is provided below (commonly used index abbreviations, the full name of each index, sources/references and typical types of environmental stress described by each index):

- **BMWP, NTAXA, ASPT**

Name: Biological Monitoring Work Party  
Reference(s): Armitage *et al.* 1983; Hawkes 1997  
Stressor described: General degradation

- **WHPT, NTAXA, ASPT**

Name: Whalley, Hawkes, Paisley, Trigg  
Reference(s): UKTAG 2014  
Stressor described: General degradation

- **AWIC(sp) Murphy**

Name: Acid Water Indicator Community  
Reference(s): Murphy *et al.* 2013  
Stressor describe: Acidity/acidification stress

- **WFD AWIC(sp) McFarland**

Name: *WFD Acid Water Indicator Community*  
Reference(s): McFarland 2010; UKTAG 2014  
Stressor described: Acidity/acidification stress

- **LIFE(sp)**

Name: Lotic-invertebrate Index for Flow Evaluation  
Reference(s): *Extence et al. 1999*  
Stressor described: Flow stress

- **PSI(sp)**

Name: Proportion of Sediment-sensitive Invertebrates  
 Reference(s): *Extence et al. 2013*  
 Stressor described: Sedimentation stress

- **SPEAR(sp)%**

Name: Species At Risk  
 Reference(s): *Beketov et al. 2008*  
 Stressor described: Pesticide stress

- **CCI**

Name: Community Conservation Index  
 Reference(s): Chadd and Extence 2004  
 Stressor described: Conservation value

### 2.3.5 RIVPACS/RICT Observed/Expected ratios

In addition to the calculation of observed biotic indices for the macroinvertebrate samples (described above) RIVPACS/RICT classification was undertaken using the RIVPACS IV predictive model (Davy-Bowker *et al.* 2008), run through the web-based RICT (River Invertebrate Classification Tool) software:

[www.sepa.org.uk/environment/water/classification/river-invertebrates-classification-tool/](http://www.sepa.org.uk/environment/water/classification/river-invertebrates-classification-tool/)

RIVPACS IV is the current RIVPACS model used by the Environment Agency and others to perform WFD quality assessments and is the industry standard for assessing the biological condition of running waters.

RIVPACS (River Invertebrate Prediction and Classification System) is a predictive model that uses environmental variables such as stream width and depth, distance from source, altitude, etc. to predict the reference (undisturbed) values of a range of biotic indices (Wright *et al.* 1997; Clarke *et al.* 2003). RIVPACS is based on a dataset of 685 GB reference sites that are grouped into similar 'end groups' whose biological communities are similar to each other. Predicted biotic indices for test samples were obtained by gathering the same environmental variables (environmental predictor variables) and running these through the model. Each test sample is assigned a probability of RIVPACS end group membership based on its environmental variables. The biotic index values of the reference sites in the various end groups then contribute to the predicted index values for the test sample. Rather than drawing the prediction solely from one end group of reference sites, the predictions of reference condition biotic indices are derived by the model as a weighted average depending upon probability of end group membership (Clarke *et al.* 2011).

The observed values of a wide range of commonly used biotic indices from the test samples were then compared to the RIVPACS expected values of the indices by the calculation of observed/expected ratios. For example, an observed biotic index value of 75 would be divided by an expected value of the same index, of say 85, to give an observed/expected (O/E) ratio of 0.882. An O/E ratio of greater than 1.0 indicates that a test sample has exceeded its predicted biotic index value (it is better than similar reference condition sites in the model); an O/E ratio of slightly below 1.0 (e.g. 0.882) indicates that a test sample is close to its predicted index value and is, therefore, only minimally impacted; an O/E ratio close to zero indicates that a test sample falls a long way short of its predicted biotic index value and it is, therefore, heavily stressed or degraded.

The O/E ratios of the Observed/Expected biotic indices were fitted into five bands, indicating the degree of disparity between the observed values and those expected by RIVPACS/RICT in the unstressed state. The five bands of O/E ratios used were as follows:

- > 1.3 Observed score better than expected
- 1.3 – 0.7 Observed score within expected range
- 0.7 – 0.5 Observed score slightly degraded compared to expected score
- 0.5 – 0.3 Observed score moderately degraded compared to expected score
- < 0.3 Observed score very degraded compared to expected score

It is important to note that the bands above are not WFD ecological status classes (which exist only for the WHPT biotic indices). They do, however, give a consistent framework to examine deviations of observed and expected biotic index values across all biotic indices used and, therefore, provide a framework to quantify the effects of a wider range of environmental stressors than WFD classification alone.

### 3. RESULTS – ELECTRIC FISHING SURVEYS

#### 3.1 Dames Slough 1

##### 3.1.1 Site description

Dames Slough Site 1 is located within an area of broadleaf / mixed woodland (see Section 2.1.1). Table 3.1 below summarises the key physical characteristics of the 100 m survey site, and Appendix 1 provides a photographic record of habitat variability. The mean wetted width was 1.40 m, with an overall surveyed area of 140.0 m<sup>2</sup>.

A mixed substrate was present throughout, with some instream vegetation present in slower and shallower sections (Table 3.1). The upstream end of the survey site was slow flowing with a deep silt substrate. Fish habitat appeared typical of a coarse fish dominated system, and this was largely reflected in the fish survey data (Section 3.1.2).

Physico-chemical parameters recorded during the time of the survey are provided in Table 3.2.

**Table 3.1. Habitat data recorded during the electric fishing survey at Dames Slough 1.**

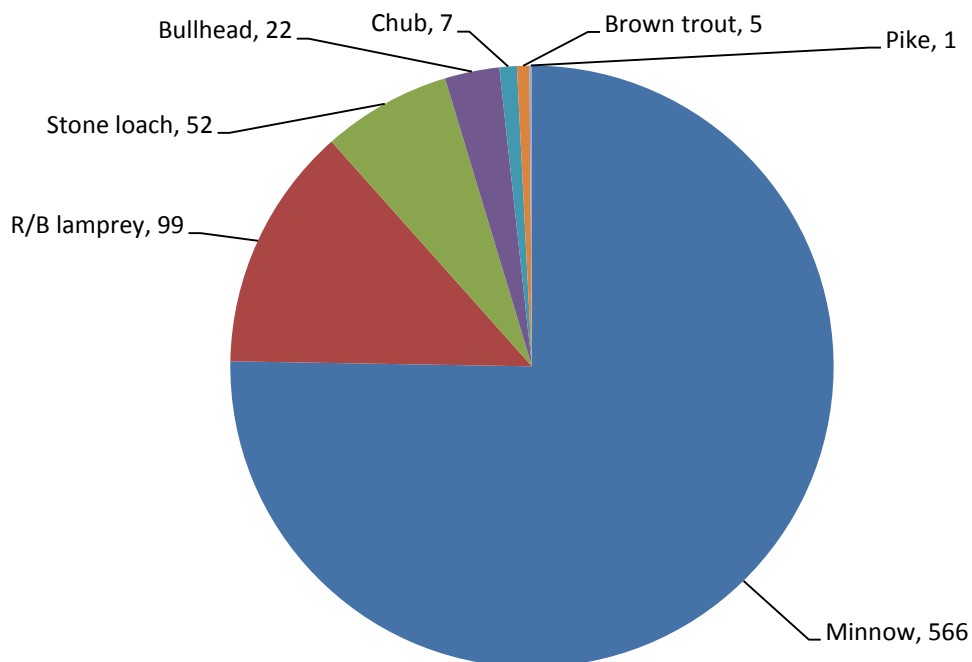
Depths (cm)	< 10	11 - 20	21 - 30	31 - 40	41 - 50	> 50		
Percent	10	10	20	20	20	20		
Substrate	Organic	Silt	Sand	Gravel	Pebble	Cobble	Boulder	Bedrock
Percent		50		50	20	10		
Instream vegetation: <b>5%</b>	Silted? <b>Yes</b>		Substrate: <b>Unstable &amp; Uncompacted</b>					
Flow	SM	DP	SP	DG	SG	RU	RI	TO
Percent	10	20	10	20	10	10	20	
Speed / Level: <b>Low</b>	FLOW DEFINITIONS: SM <10cm still/eddy, smooth, silent; DP ≥30cm slow/eddy, smooth, silent; SP <30cm slow/eddy, smooth, silent; DG ≥30cm mod/fast, smooth, silent; SG <30cm mod/fast, smooth, silent; RU fast, unbroken waves, silent; RI fast, broken waves, audible; TO white water, noisy, substrate invisible							
Bankside cover	UC	DR	BA	MA	RT	RK	OTH	
Left bank %	30	5			5			
Right bank %	30	5			5			
Total LB fish cover: <b>40 %</b>	DEFINITIONS: UC undercut banks; DR vegetation rooted in riparian zone, branches/leaves touch or almost touch surface; BA no cover or fish can't get to cover due to lack of water; MA veg rooted in stream, excl fully aquatic veg; RT cover provided by exposed roots; RK cover from rocks within bank structure; OTH other bankside cover							
Total RB fish cover: <b>40 %</b>								
Bankside land use								
LB Bankface vegetation: Bare / Uniform / <b>Simple</b> / Complex				RB Bankface vegetation: Bare / Uniform / <b>Simple</b> / Complex				
LB Banktop vegetation: Bare / Uniform / <b>Simple</b> / Complex				RB Banktop vegetation: Bare / Uniform / <b>Simple</b> / Complex				
LB Overhanging Boughs (%): <b>5</b>			RB Overhanging Boughs (%): <b>5</b>			Canopy Cover (%): <b>100</b>		

**Table 3.2. Physico-chemical parameters recorded during fish survey at Dames Slough 1.**

Parameter	Value
Temperature (°C)	14.4
Dissolved Oxygen (%)	91.5
Dissolved Oxygen (mg l <sup>-1</sup> )	9.35
Conductivity (µScm <sup>-1</sup> )	128.7
pH	7.1

### 3.1.2 Electric fishing survey results

A total of 752 fish were captured at Dames Slough 1, comprising seven species. Minnow comprised the majority of fish captured, followed by river/brook lamprey and stone loach. (Figure 3.1).



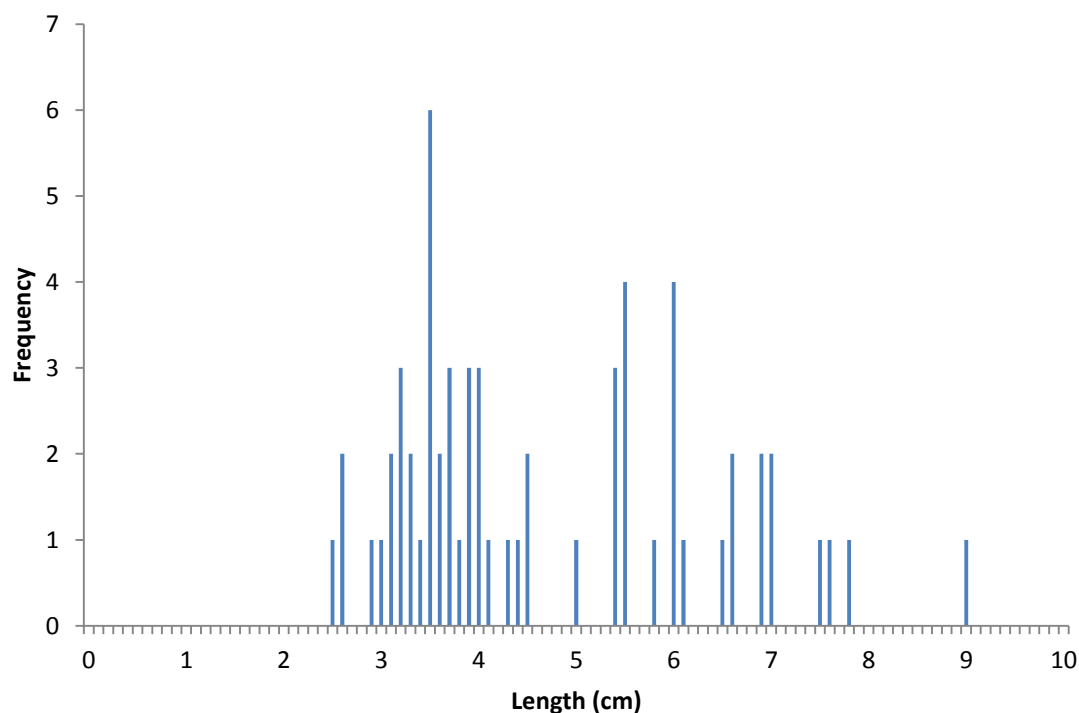
**Figure 3.1. Species composition (total number captured) at Dames Slough 1.**

The total number captured, length range (cm) and catch depletion density estimate (where relevant) for each fish species are shown in Table 3.3. The National Fisheries Classification Scheme (NFCS) classifications for 0+ and 1++ brown trout are also shown.

**Table 3.3. Number captured and catch depletion estimates (Carle & Strub), including Upper and Lower 95 % Confidence Intervals, for all species recorded at Dames Slough 1. National Fisheries Classification Scheme (NFCS) grades are also provided for brown trout.**

Species	No. captured (length range, cm)	Catch depletion population estimate	Catch depletion probability of capture	Catch depletion 95% LCI	Catch depletion 95% UCI	Catch depletion density (No./100m <sup>2</sup> )	NFCS Classification
Minnow	566 (2.5 – 9.0)	647	0.50	610	684	462	N/A
R/B lamprey	99 (6.5 – 14.5)	403	0.09	-512	1318	288	N/A
Stone loach	52 (3.4 – 10.5)	65	0.41	45	85	46	N/A
Bullhead	22 (3.0 – 6.8)	35	0.27	-2	72	25	N/A
Chub	7 (6.8 – 14.3)	7	0.58	5	9	5	N/A
Brown trout (1++)	4 (14.0 – 15.1)	4	0.80	4	4	3	D (Fair/Poor)
Brown trout (0+)	1 (5.9)	1	1.00	1	1	1	E (Poor)
Pike	1 (20.7)	1	1.00	1	1	1	N/A
<b>TOTAL</b>	<b>752</b>						

Length frequency charts for minnow, river/brook lamprey, stone loach, bullhead and brown trout are provided in Figure 3.2 to Figure 3.6 below.



**Figure 3.2. Length frequency of minnow captured at Dames Slough 1 (n=61).**

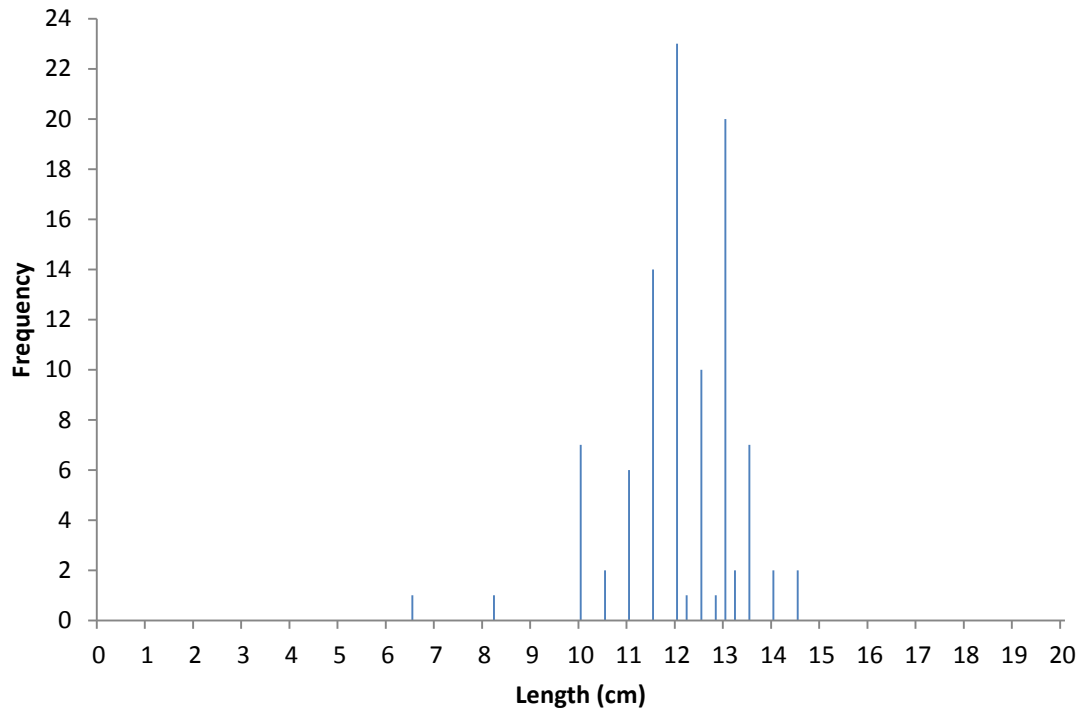


Figure 3.3. Length frequency of river/brook lamprey captured at Dames Slough 1 (n=99).

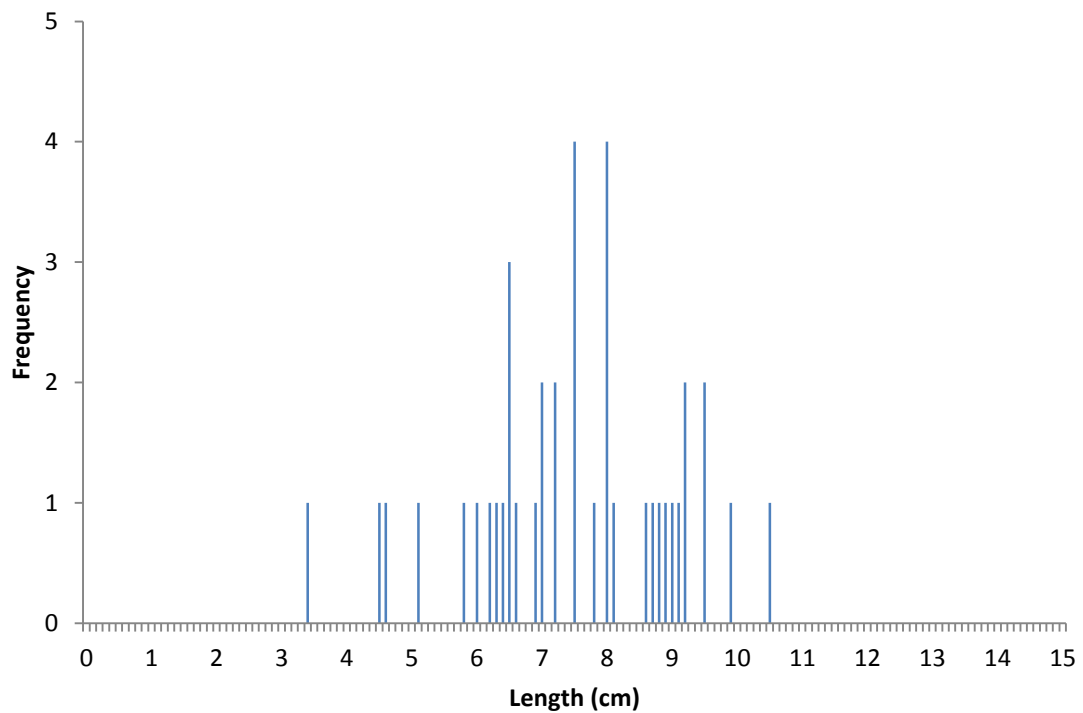


Figure 3.4. Length frequency of stone loach captured at Dames Slough 1 (n=40).



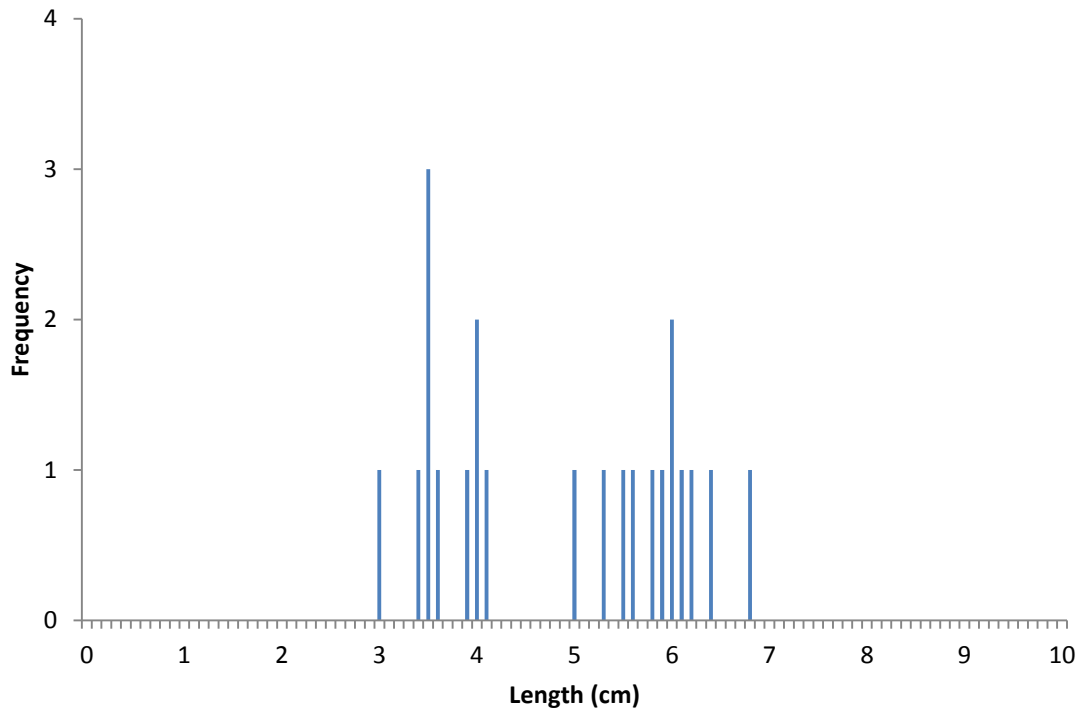


Figure 3.5. Length frequency of bullhead captured at Dames Slough 1 (n=22).

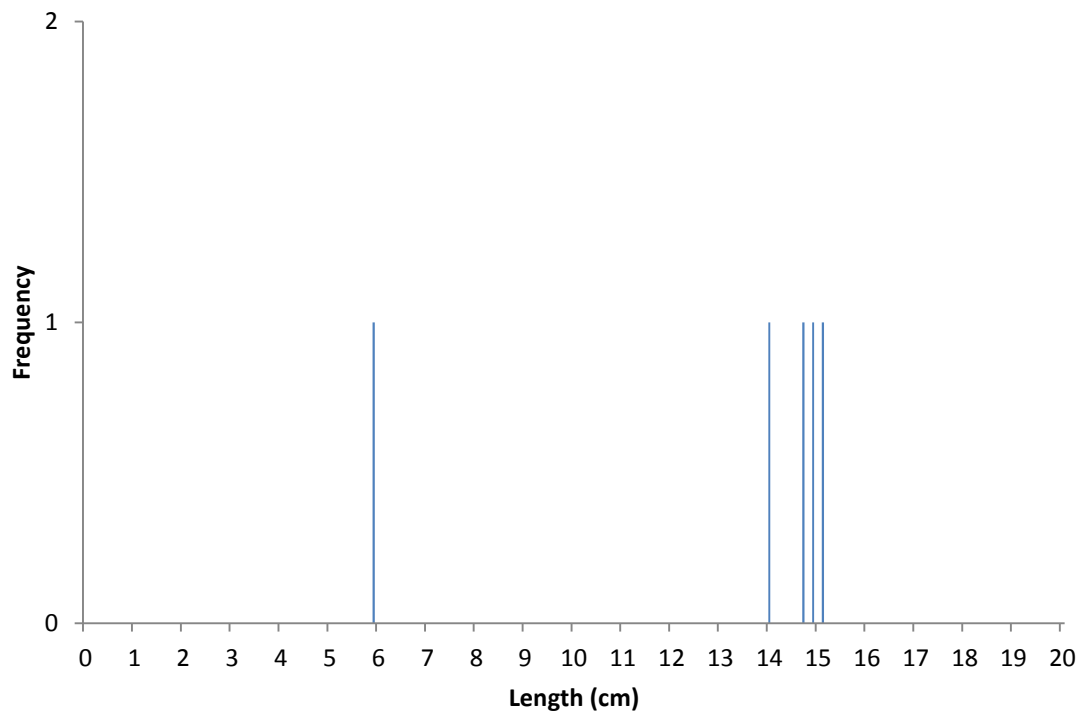


Figure 3.6. Length frequency of brown trout captured at Dames Slough 1 (n=5).

### 3.1.3 Fish species of conservation importance

Table 3.4 highlights the fish species of conservation importance that were recorded at Dames Slough 1 during the electric fishing survey.

**Table 3.4. Species of conservation importance that could potentially be present and species that were recorded during the fish survey at Dockens Water.**

Species	Conservation designation	Within natural range? <sup>1</sup>	Recorded?
Brown trout / Sea trout	UK BAP (Priority Species)	Y	Y
Bullhead	Habitats Directive (Annex II)	Y	Y
Eel	EC Eel Regulation (Eels [England and Wales] Regulations, IUCN Red List (Critically Endangered), UK BAP (Priority Species)	Y	N
Lamprey (Brook)	Habitats Directive (Annex II)	Y	Y
Lamprey (River)	Habitats Directive (Annex II)	Y <sup>2</sup>	N
Lamprey (Sea)	Habitats Directive (Annex II)	Y <sup>2</sup>	N
Salmon	UK BAP (Priority Species), Habitats Directive (Annex II)	Y <sup>3</sup>	N

<sup>1</sup> Natural range as summarised in Maitland (2004) distribution maps of fish occurring in the fresh waters of Britain and Ireland.

<sup>2</sup> River and sea lamprey are anadromous species found around the coast of the UK and, therefore, both species could potentially colonise the New Forest streams. However, it is generally accepted that brook lamprey is the only species to inhabit the New Forest streams. All lamprey recorded are, therefore, assumed to be brook lamprey.

<sup>3</sup> As an anadromous species, salmon have the ability to colonise any rivers with access to/from the sea. However, it is generally accepted that sea trout is the only migratory salmonid species present within the New Forest Streams.

## 3.2 Dames Slough 2

### 3.2.1 Site description

Dames Slough Site 2 is located within an area of broadleaf / mixed woodland and moorland / heath (see Section 2.1.1). Table 3.5 below summarises the key physical characteristics of the 100 m survey site, and Appendix 2 provides a photographic record of habitat variability. The mean wetted width was 2.63 m, with an overall surveyed area of 262.7 m<sup>2</sup>.

A mixed substrate was present throughout, with relatively abundant (50 %) instream vegetation present in slower and shallower sections (Table 3.5). Fish habitat appeared typical of a coarse fish dominated system, and this was largely reflected in the fish survey data (Section 3.2.2).

Physico-chemical parameters recorded during the time of the survey are provided in Table 3.6

**Table 3.5. Habitat data recorded during the electric fishing survey at Dames Slough 2.**

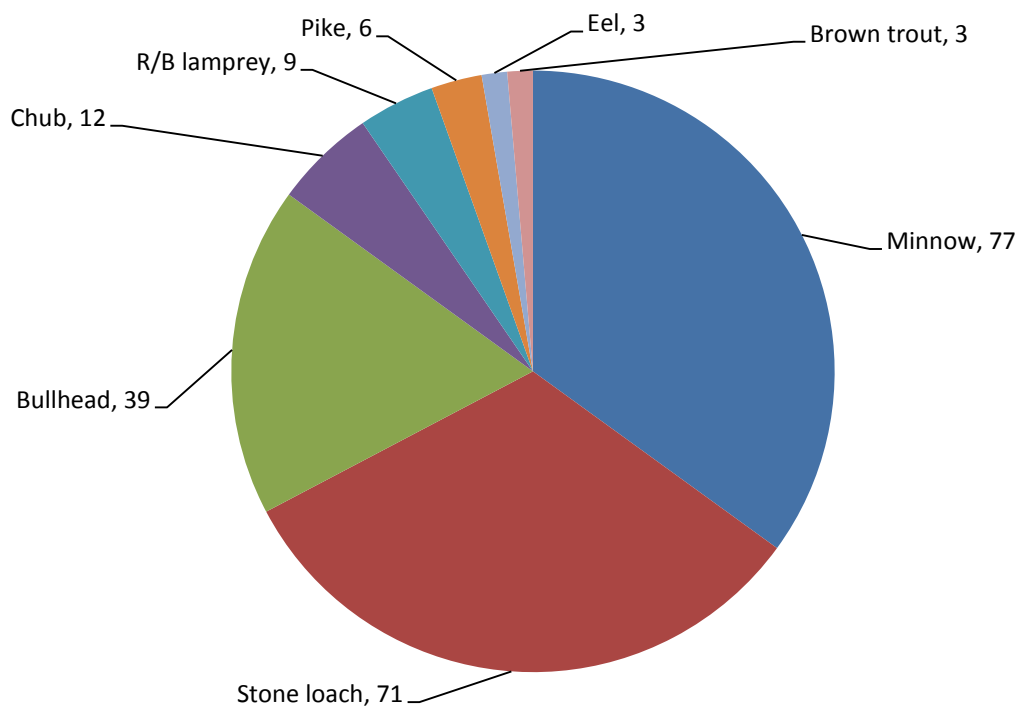
Depths (cm)	< 10	11 - 20	21 - 30	31 - 40	41 - 50	> 50		
Percent	10	10	20	20	20	20		
Substrate	Organic	Silt	Sand	Gravel	Pebble	Cobble	Boulder	Bedrock
Percent		10		80	10			
Instream vegetation: 50 %	Silted? <b>Yes</b>		Substrate: <b>Unstable &amp; Uncompacted</b>					
Flow	SM	DP	SP	DG	SG	RU	RI	TO
Percent	10	20	30			20	20	
Speed / Level: <b>Low</b>	FLOW DEFINITIONS: SM <10cm still/eddy, smooth, silent; DP ≥30cm slow/eddy, smooth, silent; SP <30cm slow/eddy, smooth, silent; DG ≥30cm mod/fast, smooth, silent; SG <30cm mod/fast, smooth, silent; RU fast, unbroken waves, silent; RI fast, broken waves, audible; TO white water, noisy, substrate invisible							
Bankside cover	UC	DR	BA	MA	RT	RK	OTH	
Left bank %	50	10			10			
Right bank %	50	10			10			
Total LB fish cover: <b>70 %</b>	DEFINITIONS: UC undercut banks; DR vegetation rooted in riparian zone, branches/leaves touch or almost touch surface; BA no cover or fish can't get to cover due to lack of water; MA veg rooted in stream, excl fully aquatic veg; RT cover provided by exposed roots; RK cover from rocks within bank structure; OTH other bankside cover							
Total RB fish cover: <b>70 %</b>								
Bankside land use								
LB Bankface vegetation: Bare / Uniform / Simple / <b>Complex</b>				RB Bankface vegetation: Bare / Uniform / Simple / <b>Complex</b>				
LB Banktop vegetation: Bare / Uniform / Simple / <b>Complex</b>				RB Banktop vegetation: Bare / Uniform / Simple / <b>Complex</b>				
LB Overhanging Boughs (%): <b>5</b>			RB Overhanging Boughs (%): <b>5</b>			Canopy Cover (%): <b>5</b>		

**Table 3.6. Physico-chemical parameters recorded during fish survey at Dames Slough 2.**

Parameter	Value
Temperature (°C)	19.1
Dissolved Oxygen (%)	113.4
Dissolved Oxygen (mg l <sup>-1</sup> )	10.49
Conductivity (µScm <sup>-1</sup> )	144.8
pH	7.21

### 3.2.2 Electric fishing survey results

A total of 220 fish were captured at Dames Slough 2, comprising eight species. Minnow was the most abundant species captured, followed by stone loach and bullhead (Figure 3.7).



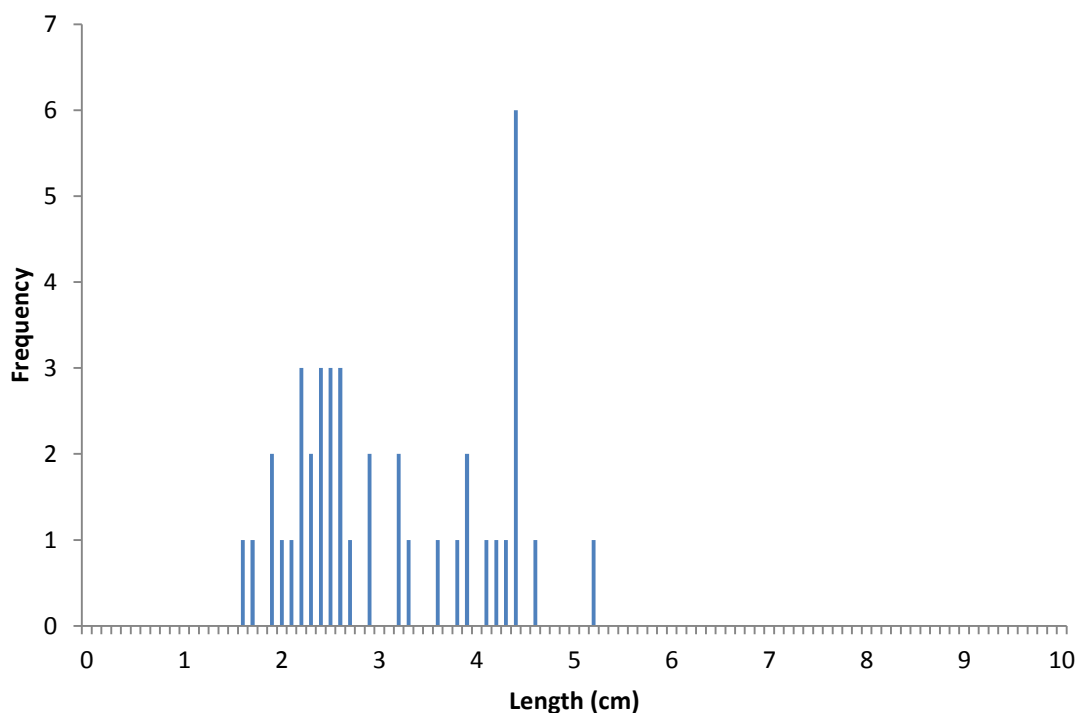
**Figure 3.7. Species composition (total number captured) at Dames Slough 2.**

The total number captured, length range (cm) and catch depletion density estimate (where relevant) for each fish species are shown in Table 3.7. The National Fisheries Classification Scheme (NFCS) classifications for 0+ and 1++ brown trout are also shown.

**Table 3.7. Number captured and catch depletion estimates (Carle & Strub), including Upper and Lower 95 % Confidence Intervals, for all species recorded at Dames Slough 2.**

Species	No. captured (length range, cm)	Catch depletion population estimate	Catch depletion probability of capture	Catch depletion 95% LCI	Catch depletion 95% UCI	Catch depletion density (No./100m <sup>2</sup> )	NFCS Classification
Minnow	77 (1.6 – 5.2)	80	0.65	75	85	30	N/A
Stone loach	71 (3.0 – 10.0)	78	0.54	68	88	30	N/A
Bullhead	39 (2.6 – 7.3)	40	0.65	36	44	15	N/A
Chub	12 (11.8 – 20.9)	12	0.63	10	14	5	N/A
R/B lamprey	9 (11.0 – 14.0)	10	0.45	4	16	4	N/A
Pike	6 (16.2 – 30.4)	6	0.75	5	7	2	N/A
Eel	3 (16.0 – 40.0)	3	0.75	2	4	1	N/A
Brown trout (0+)	3 (5.0 – 7.1)	3	0.60	2	4	1	E (Poor)
Brown trout (0++)	0	N/A	N/A	N/A	N/A	N/A	F (Fishless)
<b>TOTAL</b>	<b>220</b>						

Length frequency charts for minnow, stone loach, bullhead, chub and brown trout are provided in Figure 3.8 to Figure 3.12 below.



**Figure 3.8. Length frequency of minnow captured at Dames Slough 2 (n=41).**

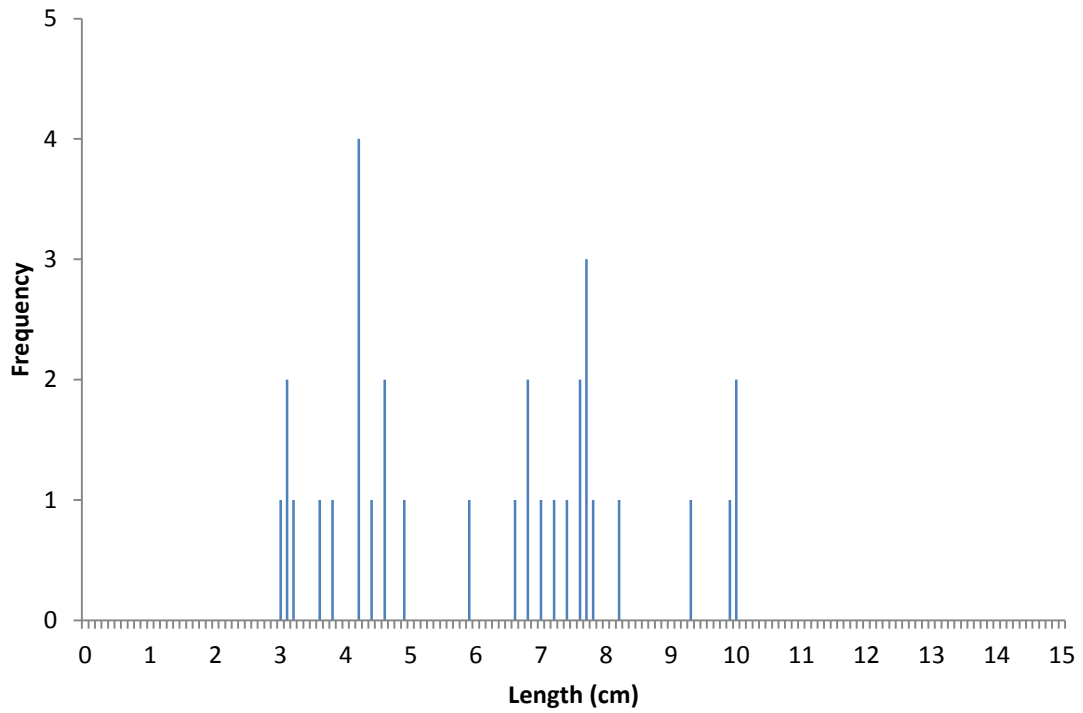


Figure 3.9. Length frequency of stone loach captured at Dames Slough 2 (n=32).

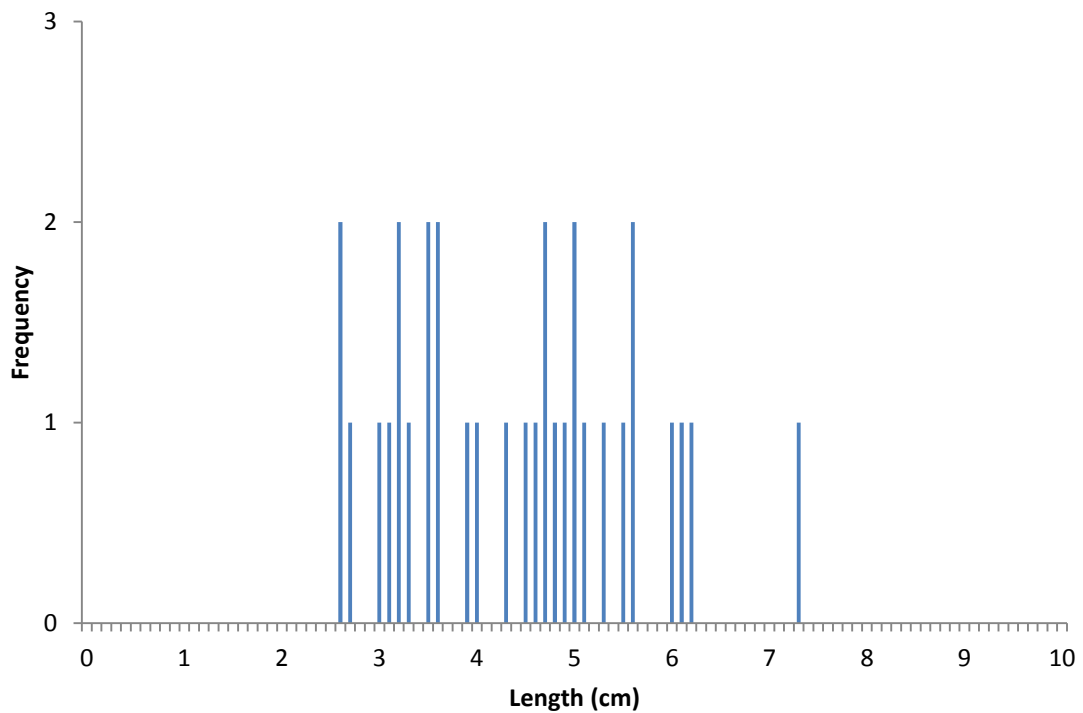


Figure 3.10. Length frequency of bullhead captured at Dames Slough 2 (n=32).

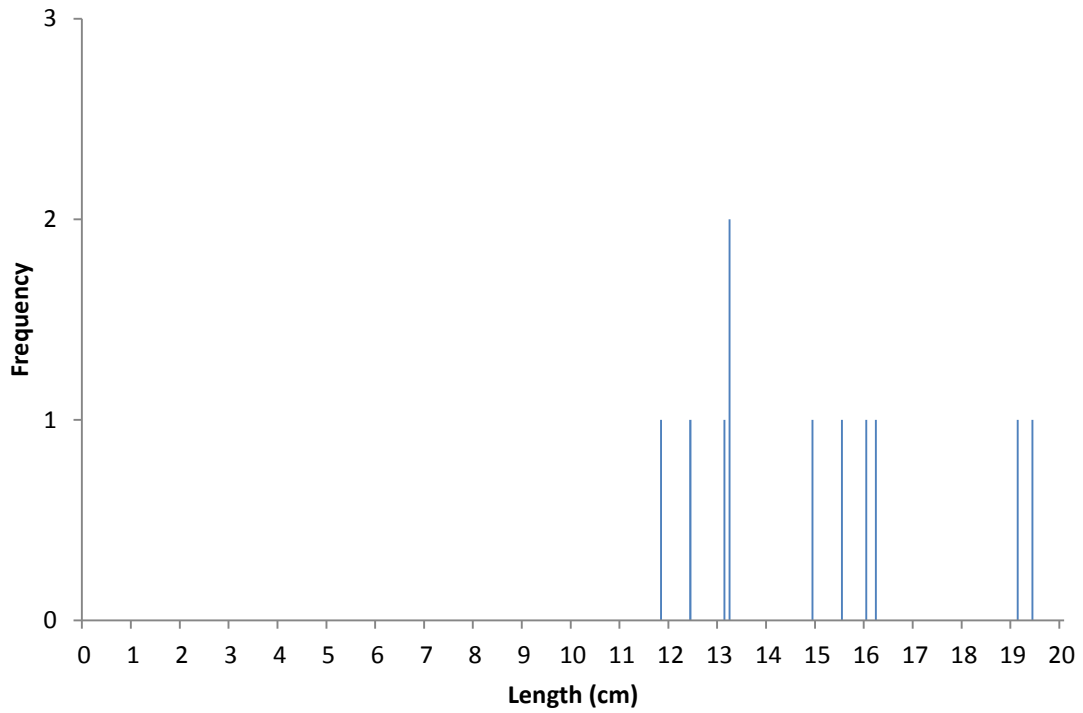


Figure 3.11. Length frequency of chub captured at Dames Slough 2 (n=12).

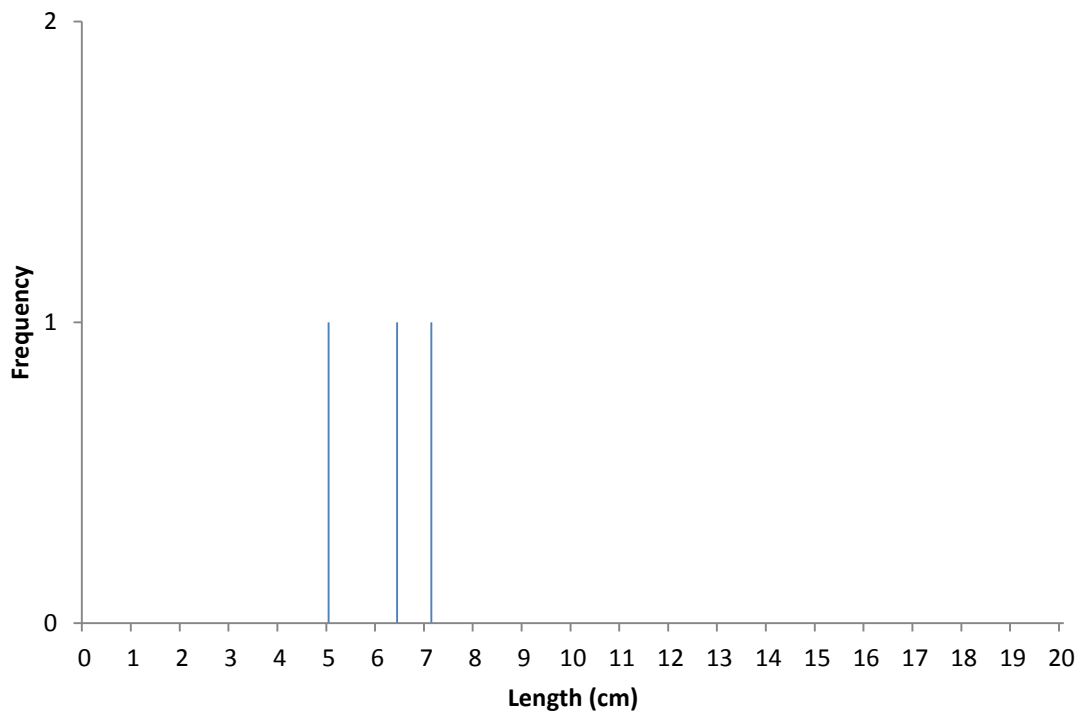


Figure 3.12. Length frequency of brown trout captured at Dames Slough 2 (n=3).

### 3.2.3 Fish species of conservation importance

Table 3.8 highlights the fish species of conservation importance that were recorded at Dames Slough 2 during the electric fishing survey.

**Table 3.8. Species of conservation importance that could potentially be present and species that were recorded during the fish survey at Dames Slough 2.**

Species	Conservation designation	Within natural range? <sup>1</sup>	Recorded?
Brown trout / Sea trout	UK BAP (Priority Species)	Y	Y
Bullhead	Habitats Directive (Annex II)	Y	Y
Eel	EC Eel Regulation (Eels [England and Wales] Regulations, IUCN Red List (Critically Endangered), UK BAP (Priority Species)	Y	Y
Lamprey (Brook)	Habitats Directive (Annex II)	Y	Y
Lamprey (River)	Habitats Directive (Annex II)	Y <sup>2</sup>	N
Lamprey (Sea)	Habitats Directive (Annex II)	Y <sup>2</sup>	N
Salmon	UK BAP (Priority Species), Habitats Directive (Annex II)	Y <sup>3</sup>	N

<sup>1</sup> Natural range as summarised in Maitland (2004) distribution maps of fish occurring in the fresh waters of Britain and Ireland.

<sup>2</sup> River and sea lamprey are anadromous species found around the coast of the UK and, therefore, both species could potentially colonise the New Forest streams. However, it is generally accepted that brook lamprey is the only species to inhabit the New Forest streams. All lamprey recorded are, therefore, assumed to be brook lamprey.

<sup>3</sup> As an anadromous species, salmon have the ability to colonise any rivers with access to/from the sea. However, it is generally accepted that sea trout is the only migratory salmonid species present within the New Forest Streams.



### 3.3 Latchmore Brook Site 1

#### 3.3.1 Site description

Latchmore Brook Site 1 is located within an area of open moorland / heath (see Section 2.1.3). Table 3.9 below summarises the key physical characteristics of the 100 m survey site, and Appendix 3 provides a photographic record of habitat variability. The mean wetted width was 3.35 m, with an overall surveyed area of 334.5 m<sup>2</sup>.

A mixed substrate was present throughout, with minimal instream vegetation present in slower and shallower sections (Table 3.9). Fish habitat appeared suitable for a variety of lithophilic species, including salmonids; although, marginal vegetation and shading was largely lacking. Flow conditions during the survey were low.

Physico-chemical parameters recorded during the time of the survey are provided in Table 3.10.

**Table 3.9. Habitat data recorded during the electric fishing survey at Latchmore Brook Site 1.**

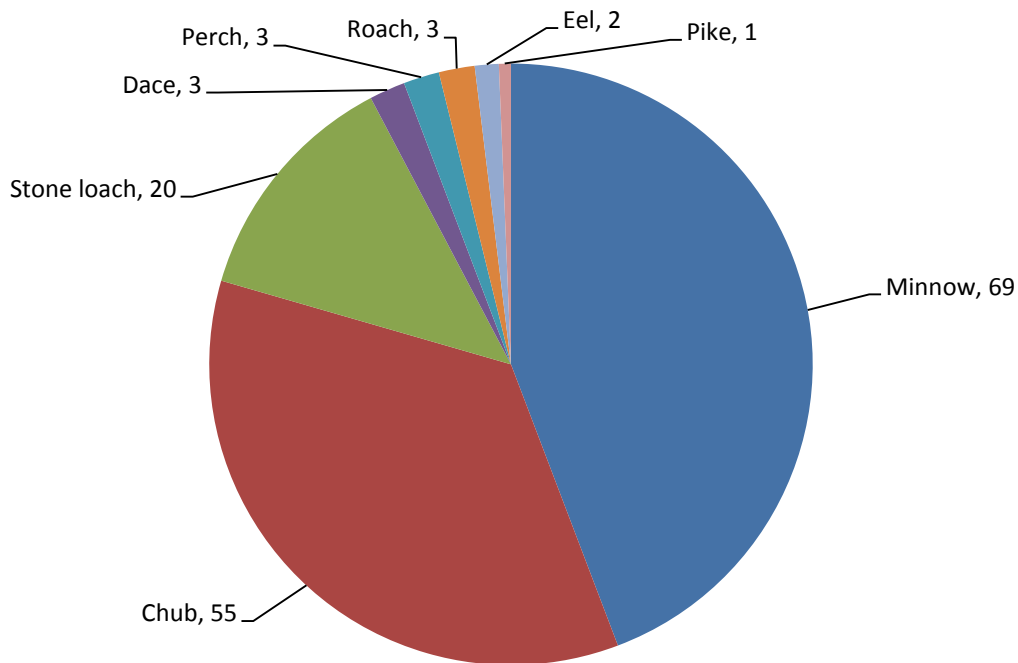
Depths (cm)	< 10	11 – 20	21 – 30	31 – 40	41 – 50	> 50		
Percent	20	10	10	20	20	20		
Substrate	Organic	Silt	Sand	Gravel	Pebble	Cobble	Boulder	Bedrock
Percent		10	10	20	40	20		
Instream vegetation: <b>10 %</b>		Silted? <b>Yes</b>		Substrate: <b>Stable &amp; Uncompacted</b>				
Flow	SM	DP	SP	DG	SG	RU	RI	TO
Percent		70				20	10	
Speed / Level: <b>Low</b>	FLOW DEFINITIONS: SM <10cm still/eddy, smooth, silent; DP ≥30cm slow/eddy, smooth, silent; SP <30cm slow/eddy, smooth, silent; DG ≥30cm mod/fast, smooth, silent; SG <30cm mod/fast, smooth, silent; RU fast, unbroken waves, silent; RI fast, broken waves, audible; TO white water, noisy, substrate invisible							
Bankside cover	UC	DR	BA	MA	RT	RK	OTH	
Left bank %	20	20				5		
Right bank %	20	20				5		
Total LB fish cover: <b>45 %</b>	DEFINITIONS: UC undercut banks; DR vegetation rooted in riparian zone, branches/leaves touch or almost touch surface; BA no cover or fish can't get to cover due to lack of water; MA veg rooted in stream, excl fully aquatic veg; RT cover provided by exposed roots; RK cover from rocks within bank structure; OTH other bankside cover							
Total RB fish cover: <b>45 %</b>								
Bankside land use								
LB Bankface vegetation: Bare / Uniform / <b>Simple</b> / Complex				RB Bankface vegetation: Bare / Uniform / <b>Simple</b> / Complex				
LB Banktop vegetation: Bare / Uniform / <b>Simple</b> / Complex				RB Banktop vegetation: Bare / Uniform / <b>Simple</b> / Complex				
LB Overhanging Boughs (%): <b>5</b>			RB Overhanging Boughs (%): <b>5</b>			Canopy Cover (%): <b>0</b>		

**Table 3.10. Physico-chemical parameters recorded during fish survey at Latchmore Brook Site 1.**

Parameter	Value
Temperature (°C)	16.1
Dissolved Oxygen (%)	99.0
Dissolved Oxygen (mg l <sup>-1</sup> )	9.74
Conductivity (µScm <sup>-1</sup> )	71.0
pH	6.76

### 3.3.2 Electric fishing survey results

A total of 156 fish were captured at Latchmore Site 1, comprising eight species. Minnow was the most abundant species captured, followed by chub and stone loach (Figure 3.13).



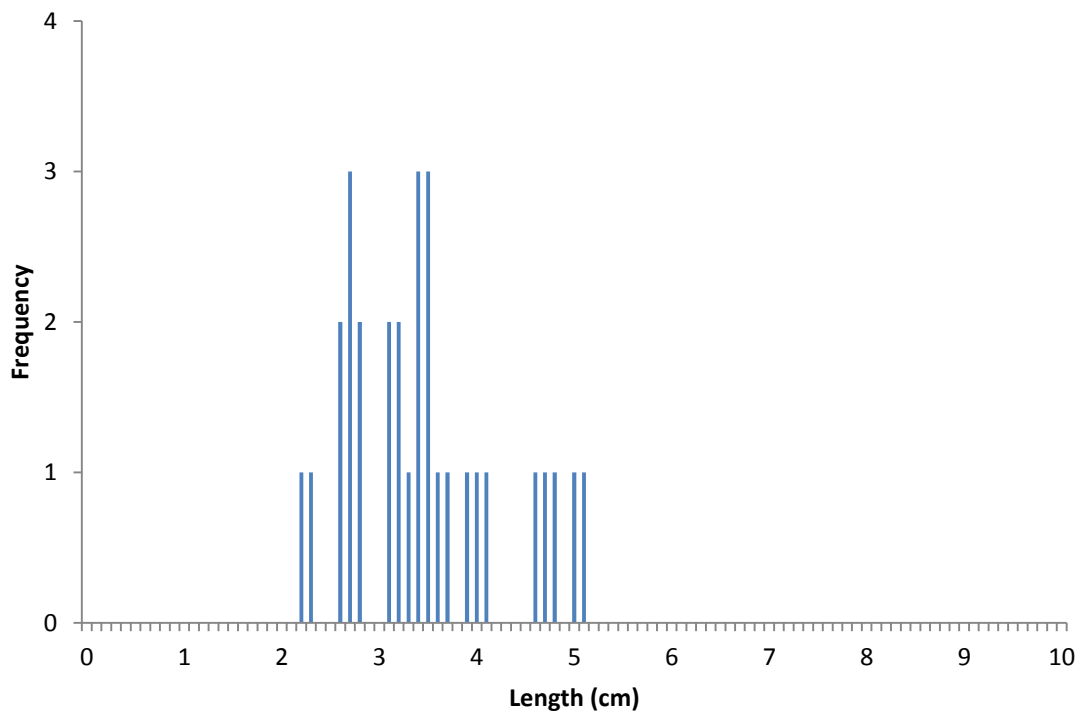
**Figure 3.13. Species composition (total number captured) at Latchmore Brook Site 1.**

The total number captured, length range (cm) and catch depletion density estimate (where relevant) for each fish species are shown in Table 3.11.

**Table 3.11. Number captured and catch depletion estimates (Carle & Strub), including Upper and Lower 95 % Confidence Intervals, for all species recorded at Latchmore Brook Site 1.**

Species	No. captured (length range, cm)	Catch depletion population estimate	Catch depletion probability of capture	Catch depletion 95% LCI	Catch depletion 95% UCI	Catch depletion density (No./100m <sup>2</sup> )
Minnow	69 (2.2 – 5.1)	71	0.68	67	75	21
Chub	55 (3.4 – 23.1)	55	0.77	53	57	16
Stone loach	20 (3.4 – 9.2)	23	0.47	15	31	7
Dace	3 (11.9 – 15.0)	3	0.42	1	5	1
Perch	3 (19.5 – 20.2)	3	0.75	2	4	1
Roach	3 (13.3 – 16.7)	3	0.67	1	3	1
Eel	2 (20.0 – 35.0)	2	0.67	1	3	1
Pike	1 (25.2)	1	1.00	1	1	<1
<b>TOTAL</b>	<b>153</b>					

Length frequency charts for minnow, chub and stone loach are provided in Figure 3.14 to Figure 3.16 below.



**Figure 3.14. Length frequency of minnow captured at Latchmore Brook Site 1 (n=30).**

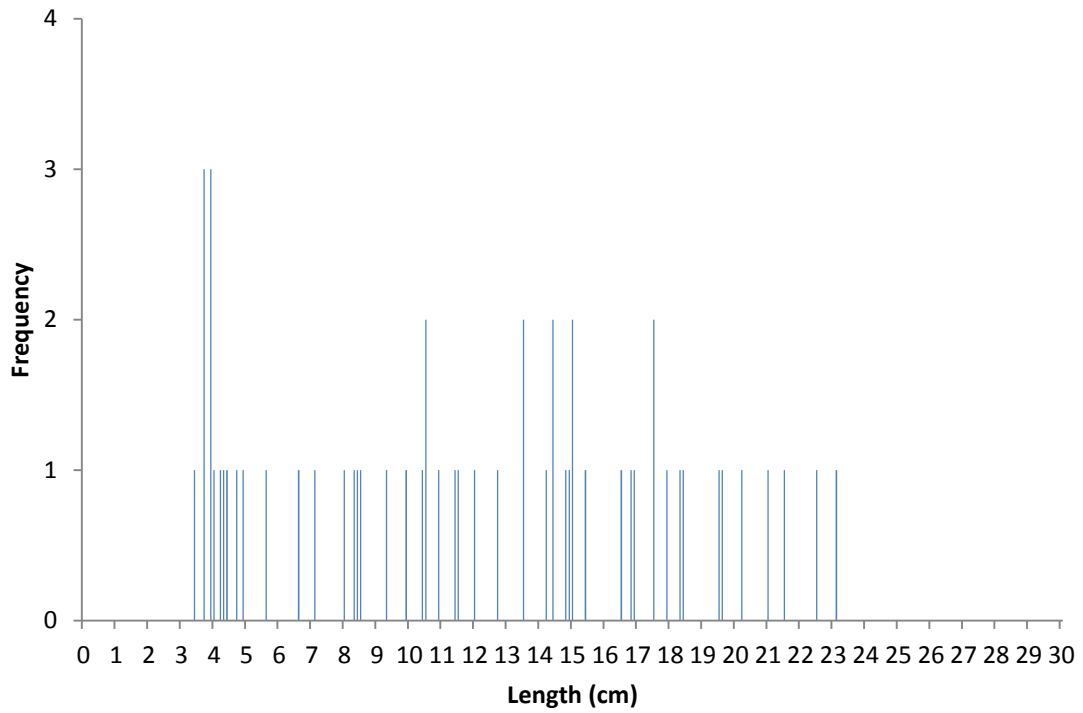


Figure 3.15. Length frequency of chub captured at Latchmore Brook Site 1 (n=55).

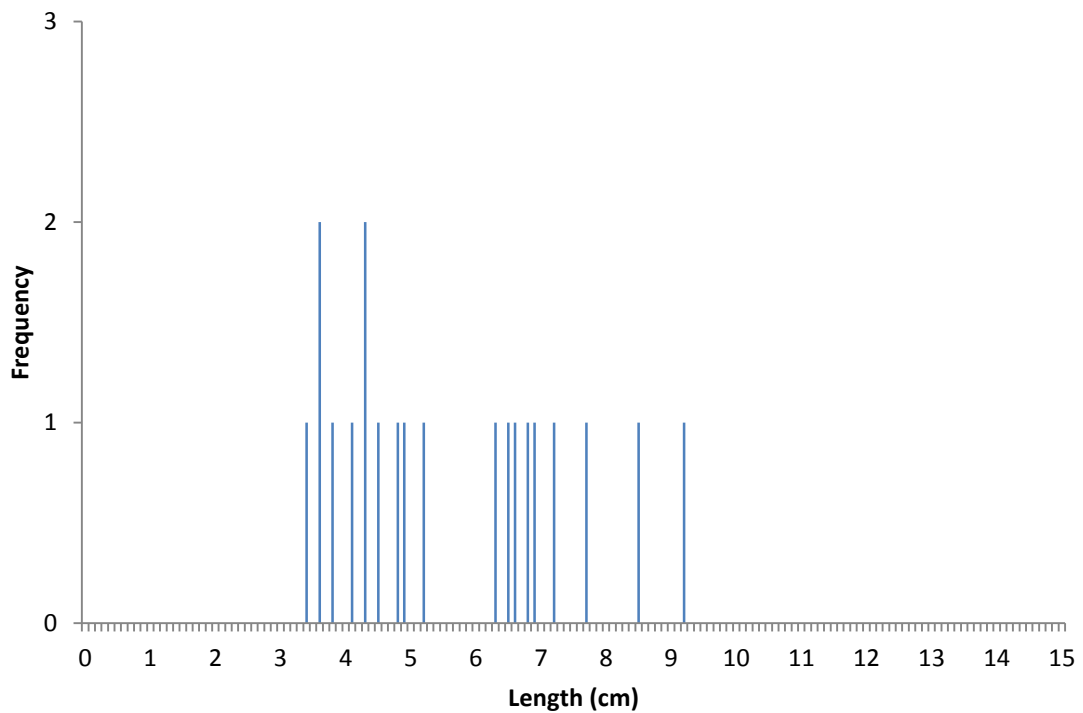


Figure 3.16. Length frequency of stone loach captured at Latchmore Brook Site 1 (n=20).

### 3.3.3 Fish species of conservation importance

Table 3.12 highlights the fish species of conservation importance that were recorded at Latchmore Brook Site 1 during the electric fishing survey.

**Table 3.12. Species of conservation importance that could potentially be present and species that were recorded during the fish survey at Latchmore Brook Site 1.**

Species	Conservation designation	Within natural range? <sup>1</sup>	Recorded?
Brown trout / Sea trout	UK BAP (Priority Species)	Y	N
Bullhead	Habitats Directive (Annex II)	Y	N
Eel	EC Eel Regulation (Eels [England and Wales] Regulations, IUCN Red List (Critically Endangered), UK BAP (Priority Species)	Y	Y
Lamprey (Brook)	Habitats Directive (Annex II)	Y	N
Lamprey (River)	Habitats Directive (Annex II)	Y <sup>2</sup>	N
Lamprey (Sea)	Habitats Directive (Annex II)	Y <sup>2</sup>	N
Salmon	UK BAP (Priority Species), Habitats Directive (Annex II)	Y <sup>3</sup>	N

<sup>1</sup> Natural range as summarised in Maitland (2004) distribution maps of fish occurring in the fresh waters of Britain and Ireland.

<sup>2</sup> River and sea lamprey are anadromous species found around the coast of the UK and, therefore, both species could potentially colonise the New Forest streams. However, it is generally accepted that brook lamprey is the only species to inhabit the New Forest streams. All lamprey recorded are, therefore, assumed to be brook lamprey.

<sup>3</sup> As an anadromous species, salmon have the ability to colonise any rivers with access to/from the sea. However, it is generally accepted that sea trout is the only migratory salmonid species present within the New Forest Streams.

### 3.4 Latchmore Brook Site 2

#### 3.4.1 Site description

Latchmore Brook Site 2 is located within an area of broadleaf / mixed woodland and moorland / heath (see Section 2.1.3). Table 3.13 below summarises the key physical characteristics of the 100 m survey site, and Appendix 4 provides a photographic record of habitat variability. The mean wetted width was 3.39 m, with an overall surveyed area of 339.1 m<sup>2</sup>.

A mixed substrate was present throughout, with minimal instream vegetation present in slower and shallower sections (Table 3.13). Fish habitat appeared suitable for a variety of lithophilic species, including salmonids, with abundant instream and marginal cover. Flow conditions during the survey were low.

Physico-chemical parameters recorded during the time of the survey are provided in Table 3.14.

**Table 3.13. Habitat data recorded during the electric fishing survey at Latchmore Brook Site 2.**

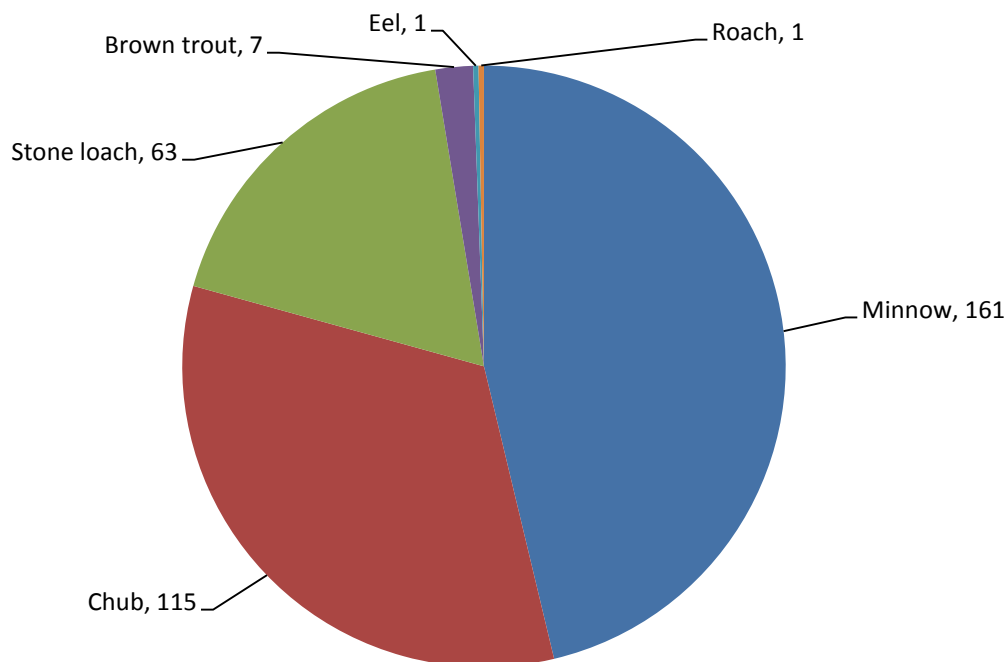
Depths (cm)	< 10	11 - 20	21 - 30	31 - 40	41 - 50	> 50		
Percent	10	10	20	20	20	20		
Substrate	Organic	Silt	Sand	Gravel	Pebble	Cobble	Boulder	Bedrock
Percent		10		10	40	40		
Instream vegetation: <b>5 %</b>		Silted? <b>Yes</b>		Substrate: <b>Stable &amp; Uncompacted</b>				
Flow	SM	DP	SP	DG	SG	RU	RI	TO
Percent		30	30			20	20	
Speed / Level: <b>Low</b>	FLOW DEFINITIONS: SM <10cm still/eddy, smooth, silent; DP ≥30cm slow/eddy, smooth, silent; SP <30cm slow/eddy, smooth, silent; DG ≥30cm mod/fast, smooth, silent; SG <30cm mod/fast, smooth, silent; RU fast, unbroken waves, silent; RI fast, broken waves, audible; TO white water, noisy, substrate invisible							
Bankside cover	UC	DR	BA	MA	RT	RK	OTH	
Left bank %	50	10			10			
Right bank %	50	10			10			
Total LB fish cover: <b>70 %</b>	DEFINITIONS: UC undercut banks; DR vegetation rooted in riparian zone, branches/leaves touch or almost touch surface; BA no cover or fish can't get to cover due to lack of water; MA veg rooted in stream, excl fully aquatic veg; RT cover provided by exposed roots; RK cover from rocks within bank structure; OTH other bankside cover							
Total RB fish cover: <b>70 %</b>								
Bankside land use								
LB Bankface vegetation: Bare / Uniform / Simple / <b>Complex</b>				RB Bankface vegetation: Bare / Uniform / Simple / <b>Complex</b>				
LB Banktop vegetation: Bare / Uniform / Simple / <b>Complex</b>				RB Banktop vegetation: Bare / Uniform / Simple / <b>Complex</b>				
LB Overhanging Boughs (%): <b>20</b>			RB Overhanging Boughs (%): <b>20</b>			Canopy Cover (%): <b>90</b>		

**Table 3.14. Physico-chemical parameters recorded during fish survey at Latchmore Brook Site 2.**

Parameter	Value
Temperature (°C)	14.6
Dissolved Oxygen (%)	93.2
Dissolved Oxygen (mg l <sup>-1</sup> )	9.47
Conductivity (µScm <sup>-1</sup> )	67.1
pH	6.60

### 3.4.2 Electric fishing survey results

A total of 348 fish were captured at Latchmore Brook Site 2, comprising six species. Minnow was the most abundant species captured, followed by chub and stone loach (Figure 3.17).



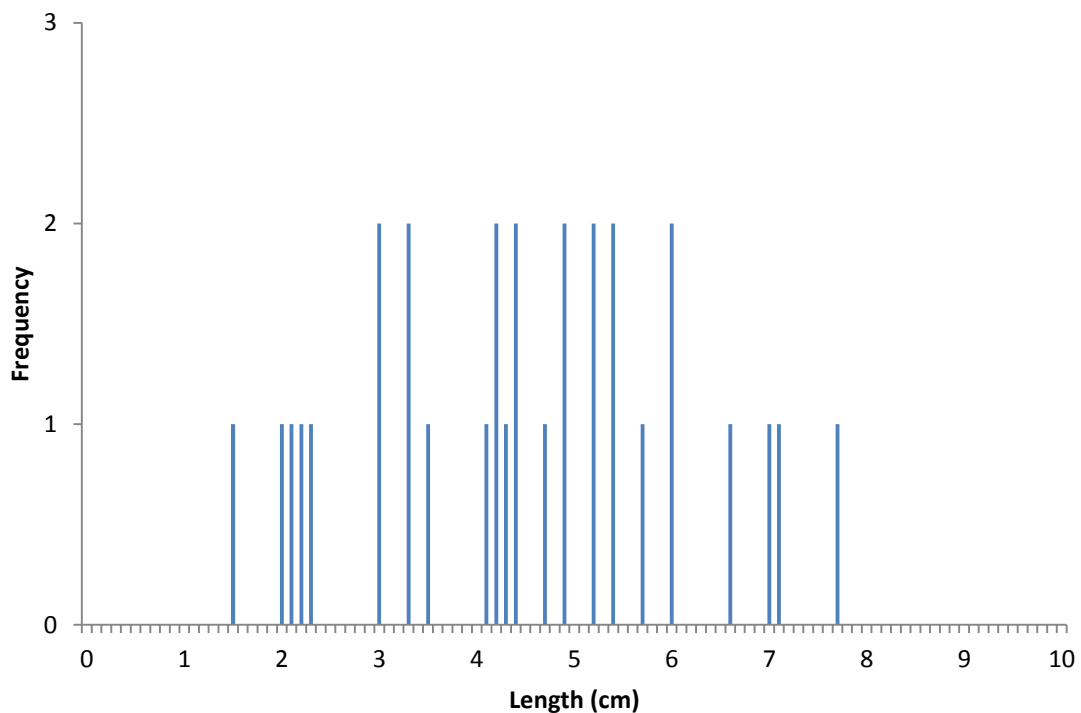
**Figure 3.17. Species composition (total number captured) at Latchmore Brook Site 2.**

The total number captured, length range (cm) and catch depletion density estimate (where relevant) for each fish species are shown in Table 3.15. The National Fisheries Classification Scheme (NFCS) classifications for 0+ and 1++ brown trout are also shown.

**Table 3.15. Number captured and catch depletion estimates (Carle & Strub), including Upper and Lower 95 % Confidence Intervals, for all species recorded at Latchmore Brook Site 2. National Fisheries Classification Scheme (NFCS) grades are also provided for brown trout.**

Species	No. captured (length range, cm)	Catch depletion population estimate	Catch depletion probability of capture	Catch depletion 95% LCI	Catch depletion 95% UCI	Catch depletion density (No./100m <sup>2</sup> )	NFCS Classification
Minnow	161 (1.5 – 7.7)	170	0.62	161	179	50	N/A
Chub	115 (3.1 – 24.0)	118	0.69	113	123	35	N/A
Stone loach	63 (3.6 – 10.6)	70	0.53	60	80	21	N/A
Brown trout (1++)	7 (13.7 – 22.0)	7	0.64	5	9	2	D (Fair/Poor)
Eel	1 (40.0)	1	1	1	1	<1	N/A
Roach	1 (12.5)	1	0.50	0	2	<1	N/A
Brown trout (0+)	0	N/A	N/A	N/A	N/A	N/A	F (Fishless)
<b>TOTAL</b>	<b>348</b>						

Length frequency charts for minnow, chub, stone loach and brown trout are provided in Figure 3.18 to Figure 3.21 below.



**Figure 3.18. Length frequency of minnow captured at Latchmore Brook Site 2 (n=30).**



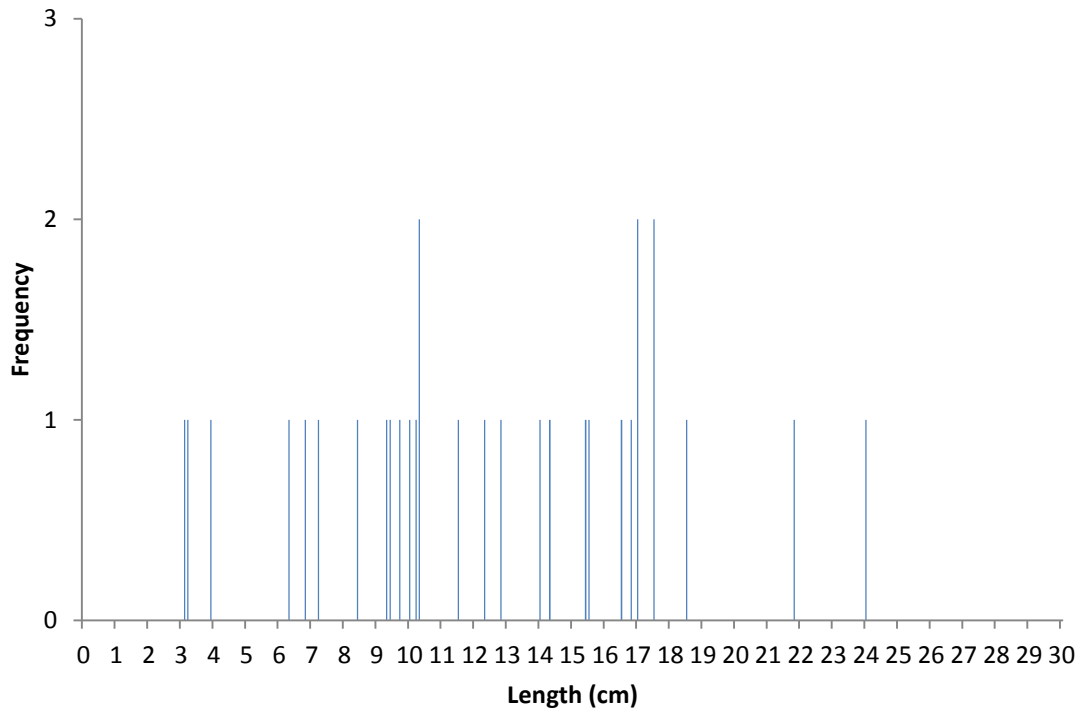


Figure 3.19. Length frequency of chub captured at Latchmore Brook Site 2 (n=30).

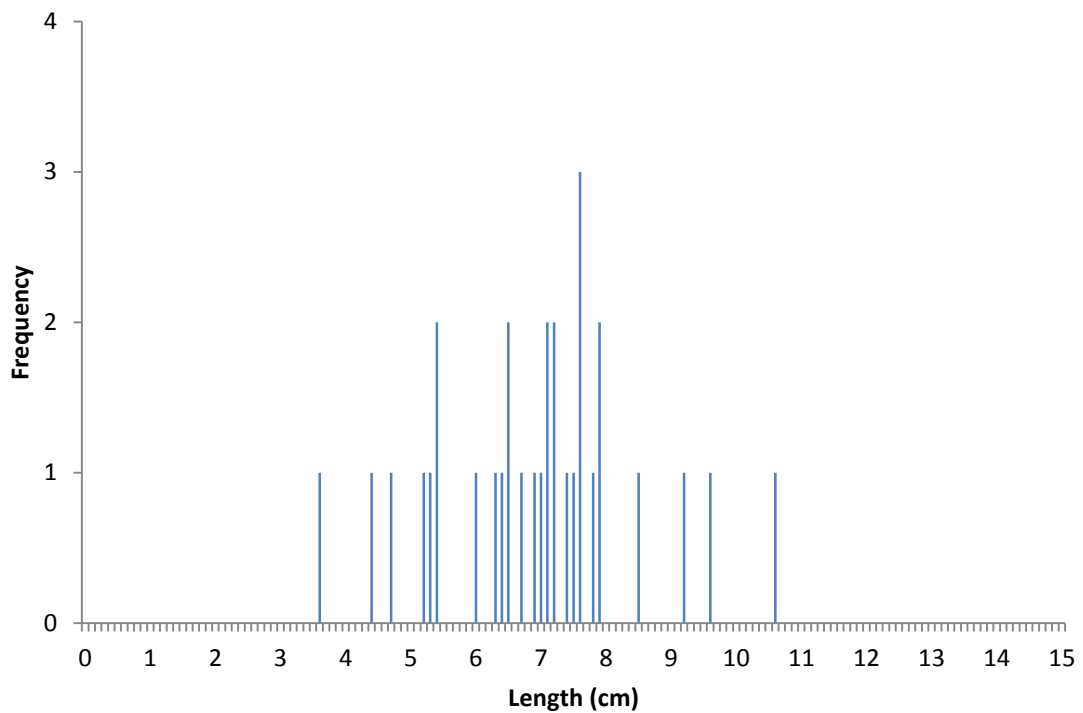
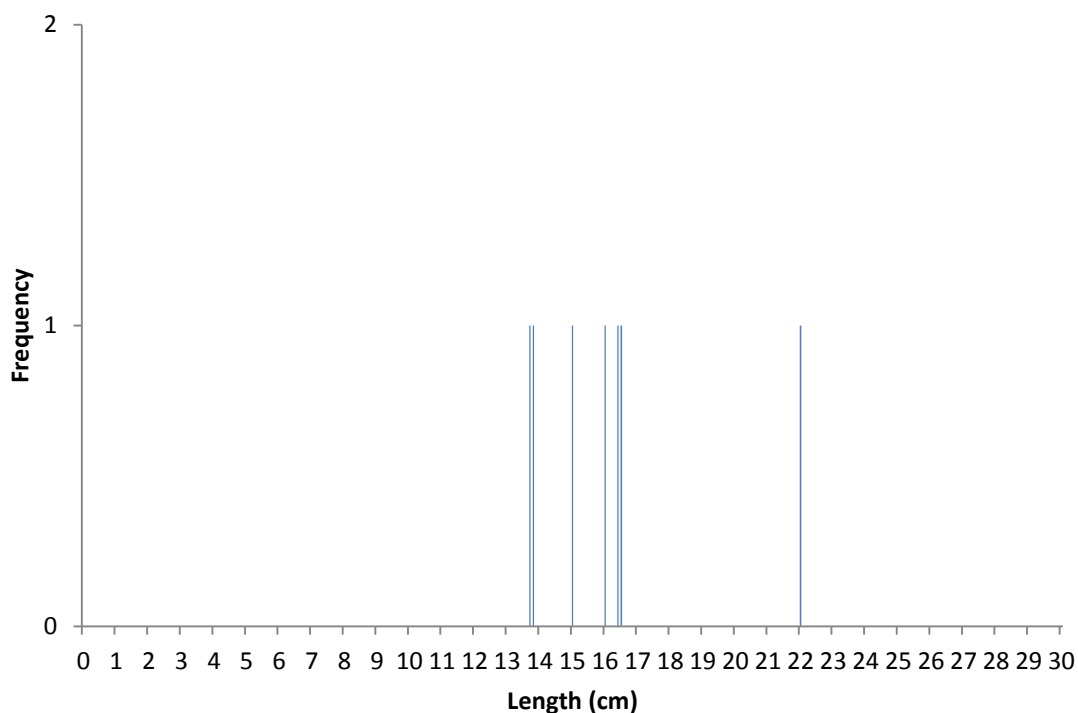


Figure 3.20. Length frequency of stone loach captured at Latchmore Brook Site 2 (n=31).



**Figure 3.21. Length frequency of brown trout captured at Latchmore Brook Site 2 (n=7).**

### 3.4.3 Fish species of conservation importance

Table 3.16 highlights the fish species of conservation importance that were recorded at Latchmore Site 2 during the electric fishing survey.

**Table 3.16. Species of conservation importance that could potentially be present and species that were recorded during the fish survey at Latchmore Brook Site 2.**

Species	Conservation designation	Within natural range? <sup>1</sup>	Recorded?
Brown trout / Sea trout	UK BAP (Priority Species)	Y	Y
Bullhead	Habitats Directive (Annex II)	Y	N
Eel	EC Eel Regulation (Eels [England and Wales] Regulations, IUCN Red List (Critically Endangered), UK BAP (Priority Species)	Y	Y
Lamprey (Brook)	Habitats Directive (Annex II)	Y	N
Lamprey (River)	Habitats Directive (Annex II)	Y <sup>2</sup>	N
Lamprey (Sea)	Habitats Directive (Annex II)	Y <sup>2</sup>	N
Salmon	UK BAP (Priority Species), Habitats Directive (Annex II)	Y <sup>3</sup>	N

<sup>1</sup> Natural range as summarised in Maitland (2004) distribution maps of fish occurring in the fresh waters of Britain and Ireland.

<sup>2</sup> River and sea lamprey are anadromous species found around the coast of the UK and, therefore, both species could potentially colonise the New Forest streams. However, it is generally accepted that brook lamprey is the only species to inhabit the New Forest streams. All lamprey recorded are, therefore, assumed to be brook lamprey.

<sup>3</sup> As an anadromous species, salmon have the ability to colonise any rivers with access to/from the sea. However, it is generally accepted that sea trout is the only migratory salmonid species present within the New Forest Streams.

### 3.5 Latchmore Brook Site 3

#### 3.5.1 Site description

Latchmore Brook Site 3 is located within an area of broadleaf / mixed woodland (see Section 2.1.3). Table 3.13 below summarises the key physical characteristics of the 100 m survey site, and Appendix 5 provides a photographic record of habitat variability.

Flow conditions were very low or still, with habitat comprising a mosaic of disconnected pools separated by dry gravel river bed. A fish survey, therefore, was not undertaken at this site.

Substrate mainly comprised gravel and pebble. Fish habitat under higher flow conditions appeared suitable for a variety of lithophilic species, including salmonid spawning habitat, with abundant instream and marginal cover (Table 3.17).

Physico-chemical parameters recorded during the time of the survey are provided in Table 3.18.

**Table 3.17. Habitat data recorded at Latchmore Brook Site 3.**

Depths (cm)	< 10	11 - 20	21 - 30	31 - 40	41 - 50	> 50		
Percent	40	40	5	5	5	5		
Substrate	Organic	Silt	Sand	Gravel	Pebble	Cobble	Boulder	Bedrock
Percent			5	50	40	5		
Instream vegetation: <b>0 %</b>		Silted? <b>No</b>		Substrate: <b>Stable &amp; Uncompacted</b>				
Flow	SM	DP	SP	DG	SG	RU	RI	TO
Percent	25	5	30			50		
Speed / Level: <b>Low</b>	FLOW DEFINITIONS: SM <10cm still/eddy, smooth, silent; DP ≥30cm slow/eddy, smooth, silent; SP <30cm slow/eddy, smooth, silent; DG ≥30cm mod/fast, smooth, silent; SG <30cm mod/fast, smooth, silent; RU fast, unbroken waves, silent; RI fast, broken waves, audible; TO white water, noisy, substrate invisible							
Bankside cover	UC	DR	BA	MA	RT	RK	OTH	
Left bank %	30	10			10			
Right bank %	30	10			10			
Total LB fish cover: <b>50 %</b>	DEFINITIONS: UC undercut banks; DR vegetation rooted in riparian zone, branches/leaves touch or almost touch surface; BA no cover or fish can't get to cover due to lack of water; MA veg rooted in stream, excl fully aquatic veg; RT cover provided by exposed roots; RK cover from rocks within bank structure; OTH other bankside cover							
Total RB fish cover: <b>50 %</b>								
Bankside land use								
LB Bankface vegetation: Bare / Uniform / Simple / <b>Complex</b>				RB Bankface vegetation: Bare / Uniform / Simple / <b>Complex</b>				
LB Banktop vegetation: Bare / Uniform / Simple / <b>Complex</b>				RB Banktop vegetation: Bare / Uniform / Simple / <b>Complex</b>				
LB Overhanging Boughs (%): <b>10</b>			RB Overhanging Boughs (%): <b>10</b>			Canopy Cover (%): <b>100</b>		

**Table 3.18. Physico-chemical parameters recorded at Latchmore Brook Site 3.**

Parameter	Value
Temperature (°C)	12.4
Dissolved Oxygen (%)	86.4
Dissolved Oxygen (mg l <sup>-1</sup> )	9.23
Conductivity (µScm <sup>-1</sup> )	95.2
pH	6.78

### 3.5.2 Electric fishing survey results

No electric fishing survey was undertaken at Latchmore Brook Site 3 due to very low / no flow conditions during the time of the survey. This site was visited after Latchmore Brook Site 4, in which a single electric fishing run was undertaken to confirm very few fish present under the flow conditions experienced (Section 3.6).

### 3.6 Latchmore Brook Site 4

#### 3.6.1 Site description

Latchmore Brook Site 4 is located within an area of broadleaf / mixed woodland (see Section 2.1.3). Table 3.19 below summarises the key physical characteristics of the 100 m survey site, and Appendix 6 provides a photographic record of habitat variability. The mean wetted width was 2.08 m, with an overall surveyed area of 208.2 m<sup>2</sup>.

Flow conditions were very low or still, with habitat comprising a mosaic of disconnected pools separated by dry gravel river bed. Substrate mainly comprised gravel and pebble. Fish habitat under higher flow conditions appeared suitable for a variety of lithophilic species, including salmonid spawning habitat, with abundant instream and marginal cover (Table 3.19).

Physico-chemical parameters recorded during the time of the survey are provided in Table 3.20.

**Table 3.19. Habitat data recorded during the electric fishing survey at Latchmore Brook Site 4.**

Depths (cm)	< 10	11 - 20	21 - 30	31 - 40	41 - 50	> 50		
Percent	50	30	5	5	5	5		
Substrate	Organic	Silt	Sand	Gravel	Pebble	Cobble	Boulder	Bedrock
Percent				30	60	10		
Instream vegetation: <b>0 %</b>		Silted? <b>No</b>		Substrate: <b>Stable &amp; Uncompacted</b>				
Flow	SM	DP	SP	DG	SG	RU	RI	TO
Percent	30	10	40				20	
Speed / Level: <b>Low</b>	FLOW DEFINITIONS: SM <10cm still/eddy, smooth, silent; DP ≥30cm slow/eddy, smooth, silent; SP <30cm slow/eddy, smooth, silent; DG ≥30cm mod/fast, smooth, silent; SG <30cm mod/fast, smooth, silent; RU fast, unbroken waves, silent; RI fast, broken waves, audible; TO white water, noisy, substrate invisible							
Bankside cover	UC	DR	BA	MA	RT	RK	OTH	
Left bank %	20				20			
Right bank %	20				20			
Total LB fish cover: <b>40 %</b>	DEFINITIONS: UC undercut banks; DR vegetation rooted in riparian zone, branches/leaves touch or almost touch surface; BA no cover or fish can't get to cover due to lack of water; MA veg rooted in stream, excl fully aquatic veg; RT cover provided by exposed roots; RK cover from rocks within bank structure; OTH other bankside cover							
Total RB fish cover: <b>40 %</b>								
Bankside land use								
LB Bankface vegetation: Bare / Uniform / <b>Simple</b> / Complex				RB Bankface vegetation: Bare / Uniform / <b>Simple</b> / Complex				
LB Banktop vegetation: Bare / Uniform / <b>Simple</b> / Complex				RB Banktop vegetation: Bare / Uniform / <b>Simple</b> / Complex				
LB Overhanging Boughs (%): <b>5</b>			RB Overhanging Boughs (%): <b>5</b>			Canopy Cover (%): <b>100</b>		

**Table 3.20. Physico-chemical parameters recorded during fish survey at Latchmore Brook Site 4.**

Parameter	Value
Temperature (°C)	12.0
Dissolved Oxygen (%)	78.1
Dissolved Oxygen (mg l <sup>-1</sup> )	8.41
Conductivity (µScm <sup>-1</sup> )	127.8
pH	7.24

### 3.6.2 Electric fishing survey results

Similar to Latchmore Brook Site 3 (visited after this site), fish habitat was extremely limited under the flow conditions exhibited during the time of the survey. However, a single electric fishing run was undertaken to confirm the presence / absence of fish under these conditions.

A total of only seven fish were captured, comprising five minnow and two juvenile roach.

### 3.7 Millersford Bottom Site 1

#### 3.7.1 Site description

Millersford Bottom Site 1 is located within an area of moorland / heath (see Section 2.1.4). Table 3.21 below summarises the key physical characteristics of the 100 m survey site, and Appendix 7 provides a photographic record of habitat variability. The mean wetted width was 0.95 m, with an overall surveyed area of 95.5 m<sup>2</sup>.

Substrate mainly comprised mixed gravel, pebble and cobble, with abundant bankside cover and marginal vegetation. Flow conditions during the survey were very low / no flow, with habitat comprising a mosaic of pools disconnected by dry river bed / wet grassland.

Physico-chemical parameters recorded during the time of the survey are provided in Table 3.22.

**Table 3.21. Habitat data recorded during the electric fishing survey at Millersford Bottom Site 1.**

Depths (cm)	< 10	11 - 20	21 - 30	31 - 40	41 - 50	> 50		
Percent	10	20	10	20	20	20		
Substrate	Organic	Silt	Sand	Gravel	Pebble	Cobble	Boulder	Bedrock
Percent		20		50	20	20		
Instream vegetation: <b>50 %</b>	Silted? <b>Yes</b>		Substrate: <b>Stable &amp; Uncompacted</b>					
Flow	SM	DP	SP	DG	SG	RU	RI	TO
Percent	20	40	40					
Speed / Level: <b>Low</b>	FLOW DEFINITIONS: SM <10cm still/eddy, smooth, silent; DP ≥30cm slow/eddy, smooth, silent; SP <30cm slow/eddy, smooth, silent; DG ≥30cm mod/fast, smooth, silent; SG <30cm mod/fast, smooth, silent; RU fast, unbroken waves, silent; RI fast, broken waves, audible; TO white water, noisy, substrate invisible							
Bankside cover	UC	DR	BA	MA	RT	RK	OTH	
Left bank %	60	20						
Right bank %	60	20						
Total LB fish cover: <b>80 %</b>	DEFINITIONS: UC undercut banks; DR vegetation rooted in riparian zone, branches/leaves touch or almost touch surface; BA no cover or fish can't get to cover due to lack of water; MA veg rooted in stream, excl. fully aquatic veg; RT cover provided by exposed roots; RK cover from rocks within bank structure; OTH other bankside cover							
Total RB fish cover: <b>80 %</b>								
Bankside land use								
LB Bankface vegetation: Bare / Uniform / Simple / <b>Complex</b>				RB Bankface vegetation: Bare / Uniform / Simple / <b>Complex</b>				
LB Banktop vegetation: Bare / Uniform / Simple / <b>Complex</b>				RB Banktop vegetation: Bare / Uniform / Simple / <b>Complex</b>				
LB Overhanging Boughs (%): <b>0</b>			RB Overhanging Boughs (%): <b>0</b>			Canopy Cover (%): <b>0</b>		



**Table 3.22. Physico-chemical parameters recorded during fish survey at Millersford Bottom Site 1.**

Parameter	Value
Temperature (°C)	14.3
Dissolved Oxygen (%)	103.2
Dissolved Oxygen (mg l <sup>-1</sup> )	10.56
Conductivity (µScm <sup>-1</sup> )	56.4
pH	5.4

### 3.7.2 Electric fishing survey results

A single electric fishing run was undertaken to ascertain the presence / absence of fish at this site.

No fish were capture or observed.

### 3.8 Millersford Bottom Site 2

#### 3.8.1 Site description

Millersford Bottom Site 2 is located within an area of broadleaf / mixed woodland and moorland / heath (see Section 2.1.4). Table 3.23 below summarises the key physical characteristics of the 100 m survey site, and Appendix 8 provides a photographic record of habitat variability. The mean wetted width was 1.99 m, with an overall surveyed area of 199.1 m<sup>2</sup>.

Substrate mainly comprised mixed gravel, pebble and cobble, with abundant bankside cover and marginal vegetation. Flow conditions during the survey were low.

Physico-chemical parameters recorded during the time of the survey are provided in Table 3.24.

**Table 3.23. Habitat data recorded during the electric fishing survey at Millersford Bottom Site 2.**

Depths (cm)	< 10	11 - 20	21 - 30	31 - 40	41 - 50	> 50		
Percent	30	30	10	10	10	10		
Substrate	Organic	Silt	Sand	Gravel	Pebble	Cobble	Boulder	Bedrock
Percent		5	10	30	50	5		
Instream vegetation: <b>0 %</b>		Silted? <b>No</b>		Substrate: <b>Stable &amp; Uncompacted</b>				
Flow	SM	DP	SP	DG	SG	RU	RI	TO
Percent	10	10	10		10	30	30	
Speed / Level: <b>Low</b>	FLOW DEFINITIONS: SM <10cm still/eddy, smooth, silent; DP ≥30cm slow/eddy, smooth, silent; SP <30cm slow/eddy, smooth, silent; DG ≥30cm mod/fast, smooth, silent; SG <30cm mod/fast, smooth, silent; RU fast, unbroken waves, silent; RI fast, broken waves, audible; TO white water, noisy, substrate invisible							
Bankside cover	UC	DR	BA	MA	RT	RK	OTH	
Left bank %	50	20			10			
Right bank %	50	20			10			
Total LB fish cover: <b>80 %</b>	DEFINITIONS: UC undercut banks; DR vegetation rooted in riparian zone, branches/leaves touch or almost touch surface; BA no cover or fish can't get to cover due to lack of water; MA veg rooted in stream, excl. fully aquatic veg; RT cover provided by exposed roots; RK cover from rocks within bank structure; OTH other bankside cover							
Total RB fish cover: <b>80 %</b>								
Bankside land use								
LB Bankface vegetation: Bare / Uniform / Simple / <b>Complex</b>				RB Bankface vegetation: Bare / Uniform / Simple / <b>Complex</b>				
LB Banktop vegetation: Bare / Uniform / Simple / <b>Complex</b>				RB Banktop vegetation: Bare / Uniform / Simple / <b>Complex</b>				
LB Overhanging Boughs (%): <b>25</b>			RB Overhanging Boughs (%): <b>25</b>			Canopy Cover (%): <b>100</b>		

**Table 3.24. Physico-chemical parameters recorded during fish survey at Millersford Bottom Site 2.**

Parameter	Value
Temperature (°C)	12.5
Dissolved Oxygen (%)	115.7
Dissolved Oxygen (mg l <sup>-1</sup> )	12.3
Conductivity (µScm <sup>-1</sup> )	300.9
pH	7.95

### 3.8.2 Electric fishing survey results

A total of 50 fish were captured at Millersford Bottom Site 2, comprising two species; brown trout and eel.

The total number captured, length range (cm) and catch depletion density estimate is shown in Table 3.25. The National Fisheries Classification Scheme (NFCS) classifications for 0+ and 1++ brown trout are also shown.

**Table 3.25. Number captured and catch depletion estimates (Carle & Strub), including Upper and Lower 95 % Confidence Intervals, for brown trout recorded at Millersford Bottom Site 2. National Fisheries Classification Scheme (NFCS) grades are also provided for brown trout.**

Species	No. captured (length range, cm)	Catch depletion population estimate	Catch depletion probability of capture	Catch depletion 95% LCI	Catch depletion 95% UCI	Catch depletion density (No./100m <sup>2</sup> )	NFCS Classification
Brown trout (1++)	37 (10.2 – 21.3)	37	0.93	36	38	19	B (Good)
Brown trout (0+)	12 (6.6 – 9.1)	13	0.67	8	18	7	D (Fair/Poor)
Eel	1	1	0.50	-2	4	1	N/A
<b>TOTAL</b>	<b>50</b>						

A length frequency chart for brown trout is provided in Figure 3.22 below.

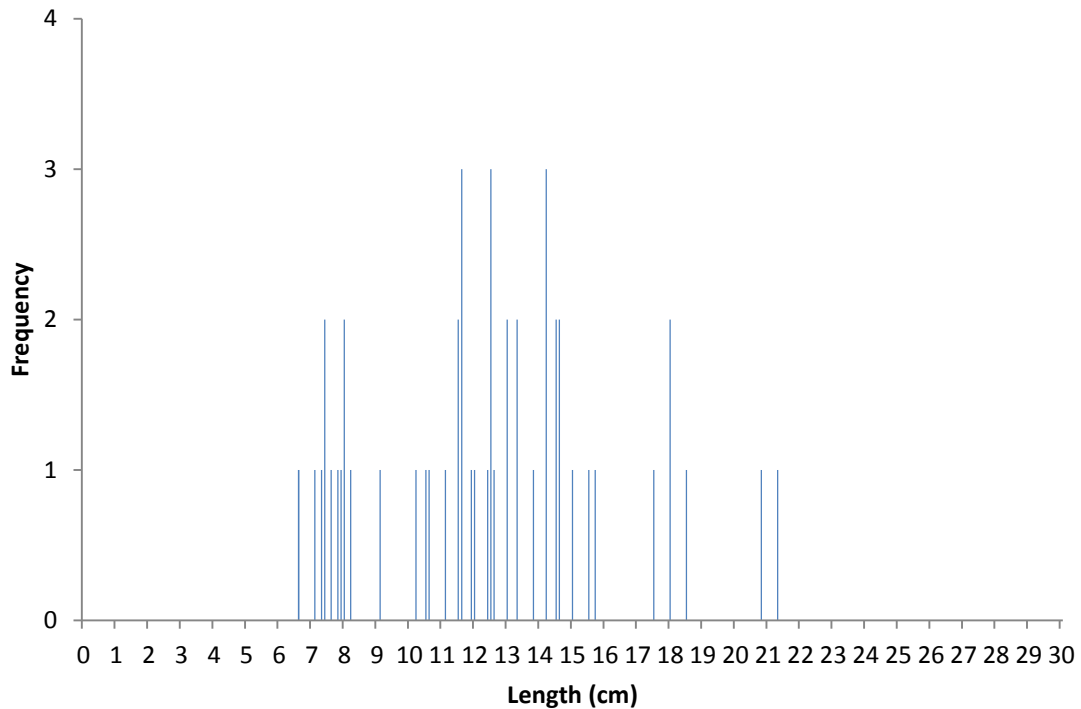


Figure 3.22. Length frequency of brown trout captured at Millersford Bottom Site 2 (n=49).

### 3.8.1 Fish species of conservation importance

Table 3.26 highlights the fish species of conservation importance that were recorded at Millersford Bottom Site 2 during the electric fishing survey.

**Table 3.26. Species of conservation importance that could potentially be present and species that were recorded during the fish survey at Millersford Bottom Site 2.**

Species	Conservation designation	Within natural range? <sup>1</sup>	Recorded?
Brown trout / Sea trout	UK BAP (Priority Species)	Y	Y
Bullhead	Habitats Directive (Annex II)	Y	N
Eel	EC Eel Regulation (Eels [England and Wales] Regulations, IUCN Red List (Critically Endangered), UK BAP (Priority Species)	Y	Y
Lamprey (Brook)	Habitats Directive (Annex II)	Y	N
Lamprey (River)	Habitats Directive (Annex II)	Y <sup>2</sup>	N
Lamprey (Sea)	Habitats Directive (Annex II)	Y <sup>2</sup>	N
Salmon	UK BAP (Priority Species), Habitats Directive (Annex II)	Y <sup>3</sup>	N

<sup>1</sup> Natural range as summarised in Maitland (2004) distribution maps of fish occurring in the fresh waters of Britain and Ireland.

<sup>2</sup> River and sea lamprey are anadromous species found around the coast of the UK and, therefore, both species could potentially colonise the New Forest streams. However, it is generally accepted that brook lamprey is the only species to inhabit the New Forest streams. All lamprey recorded are, therefore, assumed to be brook lamprey.

<sup>3</sup> As an anadromous species, salmon have the ability to colonise any rivers with access to/from the sea. However, it is generally accepted that sea trout is the only migratory salmonid species present within the New Forest Streams.

### 3.9 Millersford Bottom Site 3

#### 3.9.1 Site description

Millersford Bottom Site 3 is located within an area of broadleaf / mixed woodland and moorland / heath (see Section 2.1.4). Table 3.27 below summarises the key physical characteristics of the 100 m survey site, and Appendix 9 provides a photographic record of habitat variability. The mean wetted width was 1.62 m, with an overall surveyed area of 161.8 m<sup>2</sup>.

Substrate mainly comprised mixed gravel, pebble and cobble, with abundant bankside cover and marginal vegetation. Flow conditions during the survey were low.

Physico-chemical parameters recorded during the time of the survey are provided in Table 3.28.

**Table 3.27. Habitat data recorded during the electric fishing survey at Millersford Bottom Site 3.**

Depths (cm)	< 10	11 - 20	21 - 30	31 - 40	41 - 50	> 50		
Percent	20	20	20	20	10	10		
Substrate	Organic	Silt	Sand	Gravel	Pebble	Cobble	Boulder	Bedrock
Percent		5	10	40	40	5		
Instream vegetation: <b>0 %</b>		Silted? <b>No</b>		Substrate: <b>Stable &amp; Uncompacted</b>				
Flow	SM	DP	SP	DG	SG	RU	RI	TO
Percent	5	20	5	5	5	40	30	
Speed / Level: <b>Low</b>	FLOW DEFINITIONS: SM <10cm still/eddy, smooth, silent; DP ≥30cm slow/eddy, smooth, silent; SP <30cm slow/eddy, smooth, silent; DG ≥30cm mod/fast, smooth, silent; SG <30cm mod/fast, smooth, silent; RU fast, unbroken waves, silent; RI fast, broken waves, audible; TO white water, noisy, substrate invisible							
Bankside cover	UC	DR	BA	MA	RT	RK	OTH	
Left bank %	40				10			
Right bank %	40				10			
Total LB fish cover: <b>50 %</b>	DEFINITIONS: UC undercut banks; DR vegetation rooted in riparian zone, branches/leaves touch or almost touch surface; BA no cover or fish can't get to cover due to lack of water; MA veg rooted in stream, excl fully aquatic veg; RT cover provided by exposed roots; RK cover from rocks within bank structure; OTH other bankside cover							
Total RB fish cover: <b>50 %</b>								
Bankside land use								
LB Bankface vegetation: Bare / Uniform / Simple / <b>Complex</b>				RB Bankface vegetation: Bare / Uniform / Simple / <b>Complex</b>				
LB Banktop vegetation: Bare / Uniform / Simple / <b>Complex</b>				RB Banktop vegetation: Bare / Uniform / Simple / <b>Complex</b>				
LB Overhanging Boughs (%): <b>25</b>			RB Overhanging Boughs (%): <b>25</b>			Canopy Cover (%): <b>100</b>		

**Table 3.28. Physico-chemical parameters recorded during fish survey at Millersford Bottom Site 3.**

Parameter	Value
Temperature (°C)	14.9
Dissolved Oxygen (%)	106.6
Dissolved Oxygen (mg l <sup>-1</sup> )	10.81
Conductivity (µScm <sup>-1</sup> )	388
pH	7.99

### 3.9.2 Electric fishing survey results

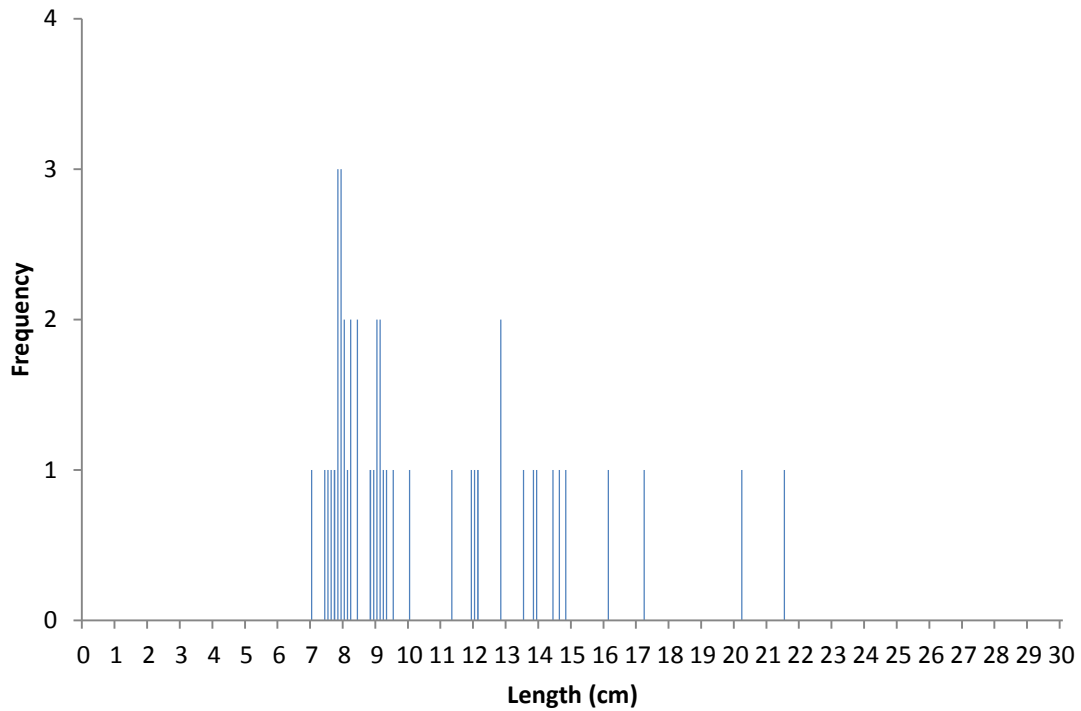
A total of 44 fish were captured at Millersford Bottom Site 3, comprising a single species; brown trout.

The total number captured, length range (cm) and catch depletion density estimate is shown in Table 3.29. The National Fisheries Classification Scheme (NFCS) classifications for 0+ and 1++ brown trout are also shown.

**Table 3.29. Number captured and catch depletion estimates (Carle & Strub), including Upper and Lower 95 % Confidence Intervals, for brown trout recorded at Millersford Bottom Site 3. National Fisheries Classification Scheme (NFCS) grades are also provided for brown trout.**

Species	No. captured (length range, cm)	Catch depletion population estimate	Catch depletion probability of capture	Catch depletion 95% LCI	Catch depletion 95% UCI	Catch depletion density (No./100m <sup>2</sup> )	NFCS Classification
Brown trout (0+)	27 (7.0 – 10.0)	27	0.90	26	28	17	B (Good)
Brown trout (1++)	17 (11.3 – 21.5)	17	0.81	15	19	11	C (Fair)
<b>TOTAL</b>	<b>44</b>						

A length frequency chart for brown trout is provided in Figure 3.23 below.



**Figure 3.23. Length frequency of brown trout captured at Millersford Bottom Site 3 (n=44).**

### 3.9.3 Fish species of conservation importance

Table 3.30 highlights the fish species of conservation importance that were recorded at Millersford Bottom Site 3 during the electric fishing survey.

**Table 3.30. Species of conservation importance that could potentially be present and species that were recorded during the fish survey at Millersford Bottom Site 3.**

Species	Conservation designation	Within natural range? <sup>1</sup>	Recorded?
Brown trout / Sea trout	UK BAP (Priority Species)	Y	Y
Bullhead	Habitats Directive (Annex II)	Y	N
Eel	EC Eel Regulation (Eels [England and Wales] Regulations, IUCN Red List (Critically Endangered), UK BAP (Priority Species)	Y	N
Lamprey (Brook)	Habitats Directive (Annex II)	Y	N
Lamprey (River)	Habitats Directive (Annex II)	Y <sup>2</sup>	N
Lamprey (Sea)	Habitats Directive (Annex II)	Y <sup>2</sup>	N
Salmon	UK BAP (Priority Species), Habitats Directive (Annex II)	Y <sup>3</sup>	N

<sup>1</sup> Natural range as summarised in Maitland (2004) distribution maps of fish occurring in the fresh waters of Britain and Ireland.



<sup>2</sup> River and sea lamprey are anadromous species found around the coast of the UK and, therefore, both species could potentially colonise the New Forest streams. However, it is generally accepted that brook lamprey is the only species to inhabit the New Forest streams. All lamprey recorded are, therefore, assumed to be brook lamprey.

<sup>3</sup> As an anadromous species, salmon have the ability to colonise any rivers with access to/from the sea. However, it is generally accepted that sea trout is the only migratory salmonid species present within the New Forest Streams.

### 3.10 Millersford Fish Site 1

#### 3.10.1 Site description

Millersford Fish Site 1 is located within an area of broadleaf / mixed woodland (see Section 2.1.4); however, the area has been subject to intensive forestry activities and the drained channel is heavily incised. Table 3.31 below summarises the key physical characteristics of the 100 m survey site, and Appendix 10 provides a photographic record of habitat variability. The mean wetted width was 1.45 m, with an overall surveyed area of 144.5 m<sup>2</sup>.

The stream was characterised by very shallow, uniform and channelised habitat, with few holding areas for fish and limited bankside cover. Flow conditions during the survey were low. The relatively poor habitat quality was reflected in a lack of any fish captured during the survey.

Physico-chemical parameters recorded during the time of the survey are provided in Table 3.32.

**Table 3.31. Habitat data recorded during the electric fishing survey at Millersford Fish Site 1.**

Depths (cm)	< 10	11 - 20	21 - 30	31 - 40	41 - 50	> 50		
Percent	30	30	20	10	5	5		
Substrate	Organic	Silt	Sand	Gravel	Pebble	Cobble	Boulder	Bedrock
Percent		10		20	50	20		
Instream vegetation: <b>0 %</b>		Silted? <b>Yes</b>		Substrate: <b>Stable &amp; Uncompacted</b>				
Flow	SM	DP	SP	DG	SG	RU	RI	TO
Percent		10	10	10	10	30	30	
Speed / Level: <b>Low</b>	FLOW DEFINITIONS: SM <10cm still/eddy, smooth, silent; DP ≥30cm slow/eddy, smooth, silent; SP <30cm slow/eddy, smooth, silent; DG ≥30cm mod/fast, smooth, silent; SG <30cm mod/fast, smooth, silent; RU fast, unbroken waves, silent; RI fast, broken waves, audible; TO white water, noisy, substrate invisible							
Bankside cover	UC	DR	BA	MA	RT	RK	OTH	
Left bank %	5			5				
Right bank %	5			5				
Total LB fish cover: <b>10 %</b>	DEFINITIONS: UC undercut banks; DR vegetation rooted in riparian zone, branches/leaves touch or almost touch surface; BA no cover or fish can't get to cover due to lack of water; MA veg rooted in stream, excl fully aquatic veg; RT cover provided by exposed roots; RK cover from rocks within bank structure; OTH other bankside cover							
Total RB fish cover: <b>10 %</b>								
Bankside land use								
LB Bankface vegetation: Bare / Uniform / Simple / <b>Complex</b>				RB Bankface vegetation: Bare / Uniform / Simple / <b>Complex</b>				
LB Banktop vegetation: Bare / Uniform / Simple / <b>Complex</b>				RB Banktop vegetation: Bare / Uniform / Simple / <b>Complex</b>				
LB Overhanging Boughs (%): <b>5</b>			RB Overhanging Boughs (%): <b>5</b>			Canopy Cover (%): <b>5</b>		

**Table 3.32. Physico-chemical parameters recorded during fish survey at Millersford Fish Site 1.**

Parameter	Value
Temperature (°C)	12.7
Dissolved Oxygen (%)	100.0
Dissolved Oxygen (mg l <sup>-1</sup> )	10.3
Conductivity (µScm <sup>-1</sup> )	54.0
pH	5.4

### 3.10.2 Electric fishing survey results

A single electric fishing run was undertaken to ascertain the presence / absence of fish at this site.

No fish were capture or observed.

### 3.11 Pondhead Site 1

#### 3.11.1 Site description

Pondhead Site 1 is located within an area of broadleaf / mixed woodland, with canopy cover along approximately 90 % of the surveyed river stretch (see Section 2.1.5). Table 3.33 below summarises the key physical characteristics of the 100 m survey site, and Appendix 11 provides a photographic record of habitat variability. The mean wetted width was 2.65 m, with an overall surveyed area of 265.5 m<sup>2</sup>.

The river reach comprised a diversity of habitat types. Substrate was largely comprised of gravel, pebble and cobbles. Flow conditions during the survey were low.

Physico-chemical parameters recorded during the time of the survey are provided in Table 3.34.

**Table 3.33. Habitat data recorded during the electric fishing survey at Pondhead Site 1.**

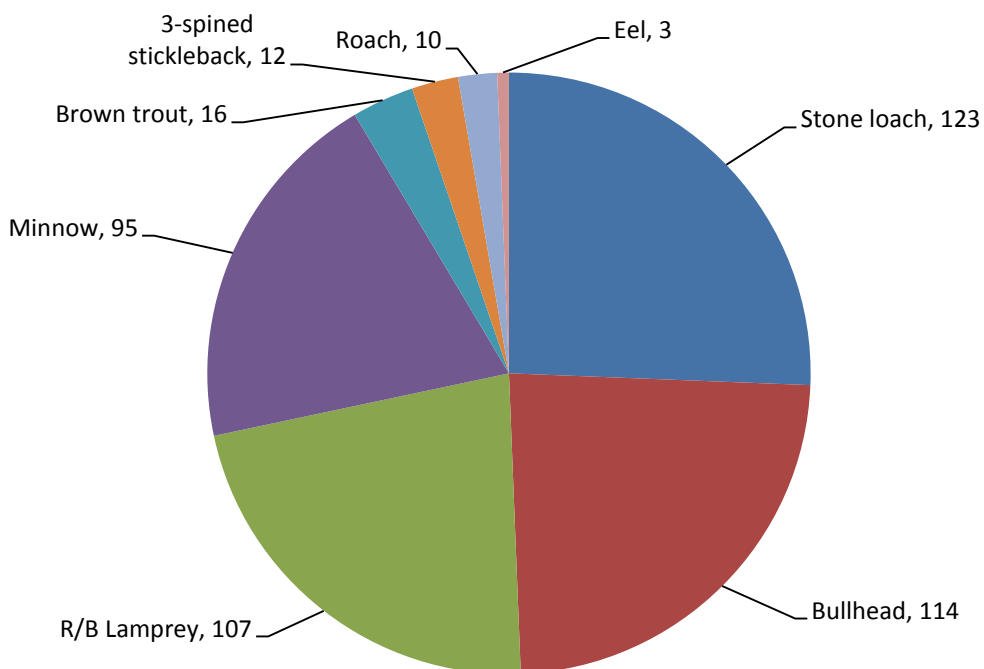
Depths (cm)	< 10	11 - 20	21 - 30	31 - 40	41 - 50	> 50		
Percent	10	10	20	20	20	20		
Substrate	Organic	Silt	Sand	Gravel	Pebble	Cobble	Boulder	Bedrock
Percent	10	10		30	50			
Instream vegetation: <b>0 %</b>	Silted? <b>Yes</b>		Substrate: <b>Stable &amp; Uncompacted</b>					
Flow	SM	DP	SP	DG	SG	RU	RI	TO
Percent	10	30		10		30	20	
Speed / Level: <b>Low</b>	FLOW DEFINITIONS: SM <10cm still/eddy, smooth, silent; DP ≥30cm slow/eddy, smooth, silent; SP <30cm slow/eddy, smooth, silent; DG ≥30cm mod/fast, smooth, silent; SG <30cm mod/fast, smooth, silent; RU fast, unbroken waves, silent; RI fast, broken waves, audible; TO white water, noisy, substrate invisible							
Bankside cover	UC	DR	BA	MA	RT	RK	OTH	
Left bank %	40	10			10			
Right bank %	40	10			10			
Total LB fish cover: <b>60 %</b>	DEFINITIONS: UC undercut banks; DR vegetation rooted in riparian zone, branches/leaves touch or almost touch surface; BA no cover or fish can't get to cover due to lack of water; MA veg rooted in stream, excl fully aquatic veg; RT cover provided by exposed roots; RK cover from rocks within bank structure; OTH other bankside cover							
Total RB fish cover: <b>60 %</b>								
Bankside land use								
LB Bankface vegetation: Bare / Uniform / <b>Simple</b> / Complex				RB Bankface vegetation: Bare / Uniform / <b>Simple</b> / Complex				
LB Banktop vegetation: Bare / Uniform / <b>Simple</b> / Complex				RB Banktop vegetation: Bare / Uniform / <b>Simple</b> / Complex				
LB Overhanging Boughs (%): <b>5</b>			RB Overhanging Boughs (%): <b>5</b>			Canopy Cover (%): <b>100</b>		

**Table 3.34. Physico-chemical parameters recorded during fish survey at Pondhead Site 1.**

Parameter	Value
Temperature (°C)	15.2
Dissolved Oxygen (%)	89.5
Dissolved Oxygen (mg l <sup>-1</sup> )	8.99
Conductivity (µScm <sup>-1</sup> )	234.9
pH	7.27

### 3.11.2 Electric fishing survey results

A total of 480 fish were captured at Pondhead Site 1, comprising eight species. Stone loach was the most abundant species captured, followed by bullhead, R/B lamprey and minnow (Figure 3.24).



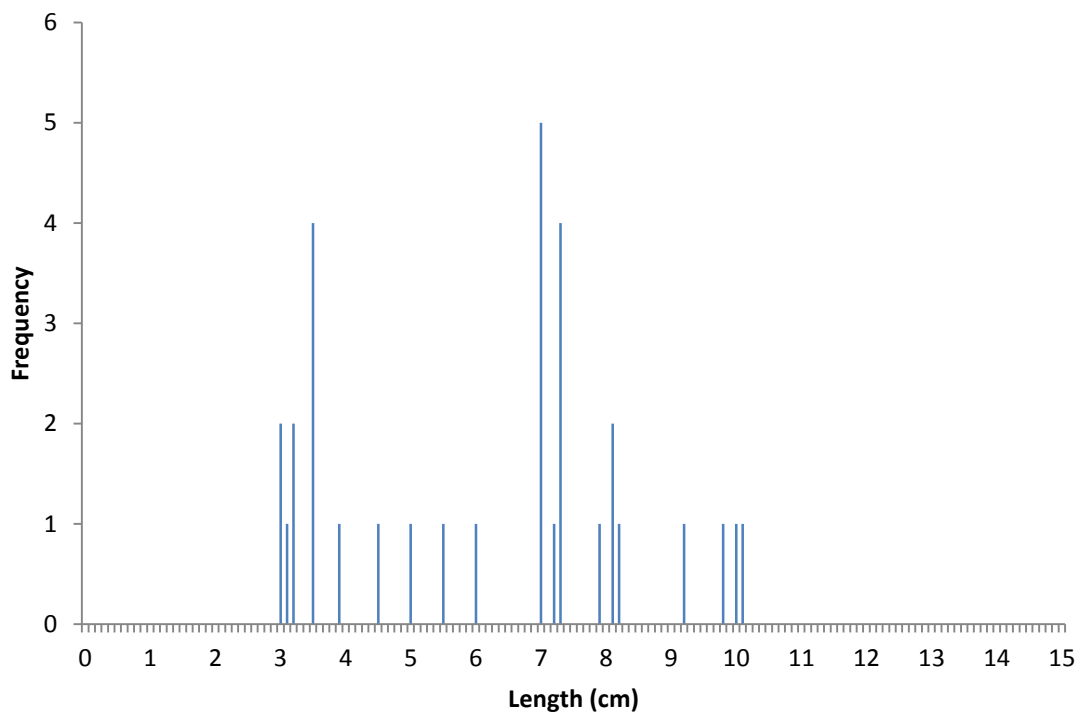
**Figure 3.24. Species composition (total number captured) at Pondhead Site 1.**

The total number captured, length range (cm) and catch depletion density estimate (where relevant) for each fish species are shown in Table 3.35. The National Fisheries Classification Scheme (NFCS) classifications for 0+ and 1++ brown trout are also shown.

**Table 3.35. Number captured and catch depletion estimates (Carle & Strub), including Upper and Lower 95 % Confidence Intervals, for all species recorded at Pondhead Site 1. National Fisheries Classification Scheme (NFCS) grades are also provided for brown trout.**

Species	No. captured (length range, cm)	Catch depletion population estimate	Catch depletion probability of capture	Catch depletion 95% LCI	Catch depletion 95% UCI	Catch depletion density (No./100m <sup>2</sup> )	NFCS Classification
Stone loach	123 (3.0 – 10.1)	156	0.40	124	188	59	N/A
Bullhead	114 (2.1 – 7.0)	185	0.27	101	269	70	N/A
R/B lamprey	107 (7.0 – 17.0)	186	0.25	84	288	70	N/A
Minnow	95 (1.6 – 9.2)	100	0.62	93	107	38	N/A
3-spined stickleback	12 (2.5 – 5.0)	12	0.67	10	14	5	N/A
Brown trout (1++)	11 (14.0 – 25.5)	11	0.85	11	11	4	D (Fair/Poor)
Roach	10 (7.0 – 15.0)	10	0.71	9	11	4	N/A
Brown trout (0+)	5 (6.0 – 8.6)	5	0.83	5	5	2	E (Poor)
Eel	3 (20.0 – 40.0)	3	0.60	2	4	1	N/A
<b>TOTAL</b>	<b>480</b>						

Length frequency charts for stone loach, bullhead, R/B lamprey, minnow and brown trout are provided in Figure 3.25 to Figure 3.29 below.



**Figure 3.25. Length frequency of stone loach captured at Pondhead Site 1 (n=32).**

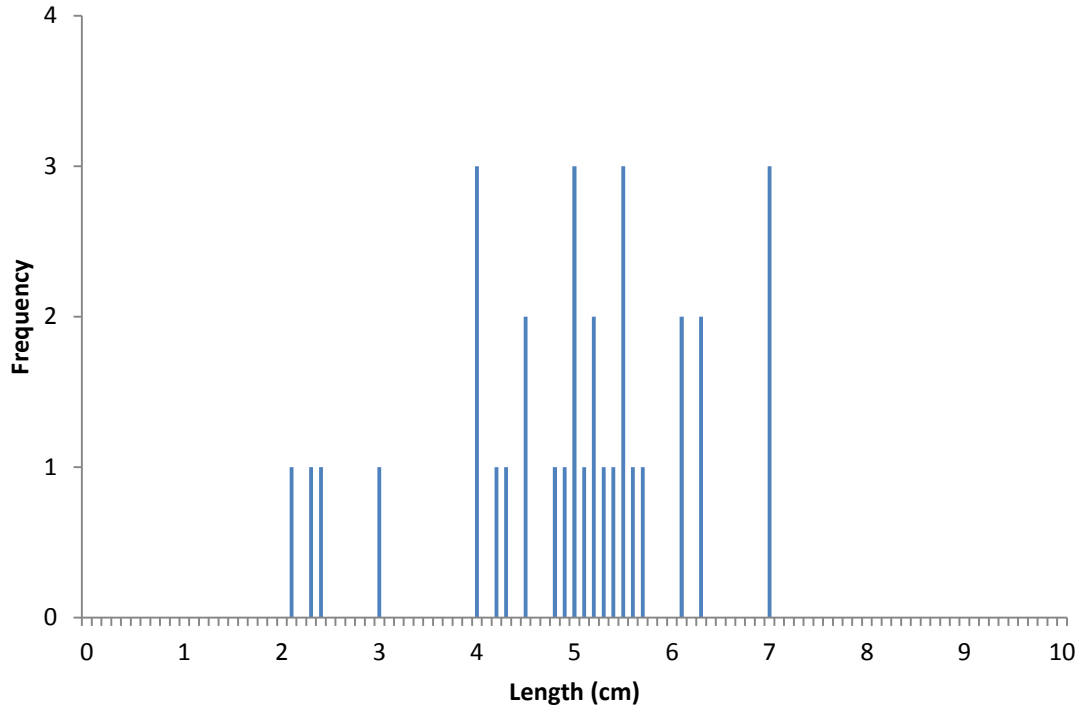


Figure 3.26. Length frequency of bullhead captured at Pondhead Site 1 (n=33).

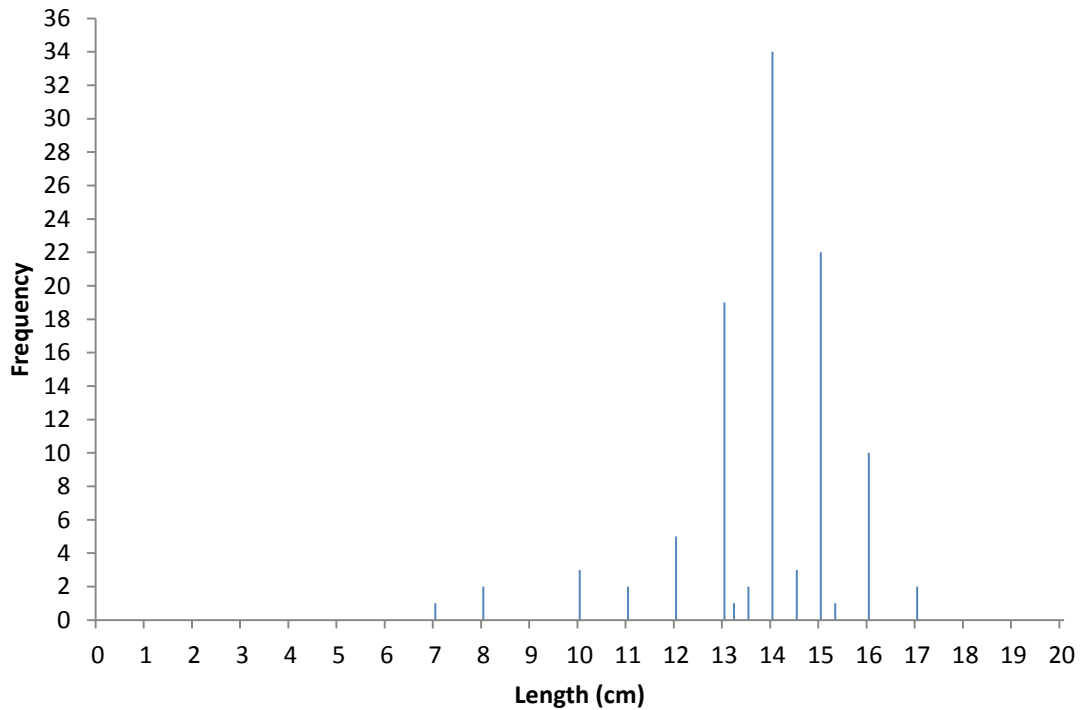


Figure 3.27. Length frequency of R/B lamprey captured at Pondhead Site 1 (n=107).

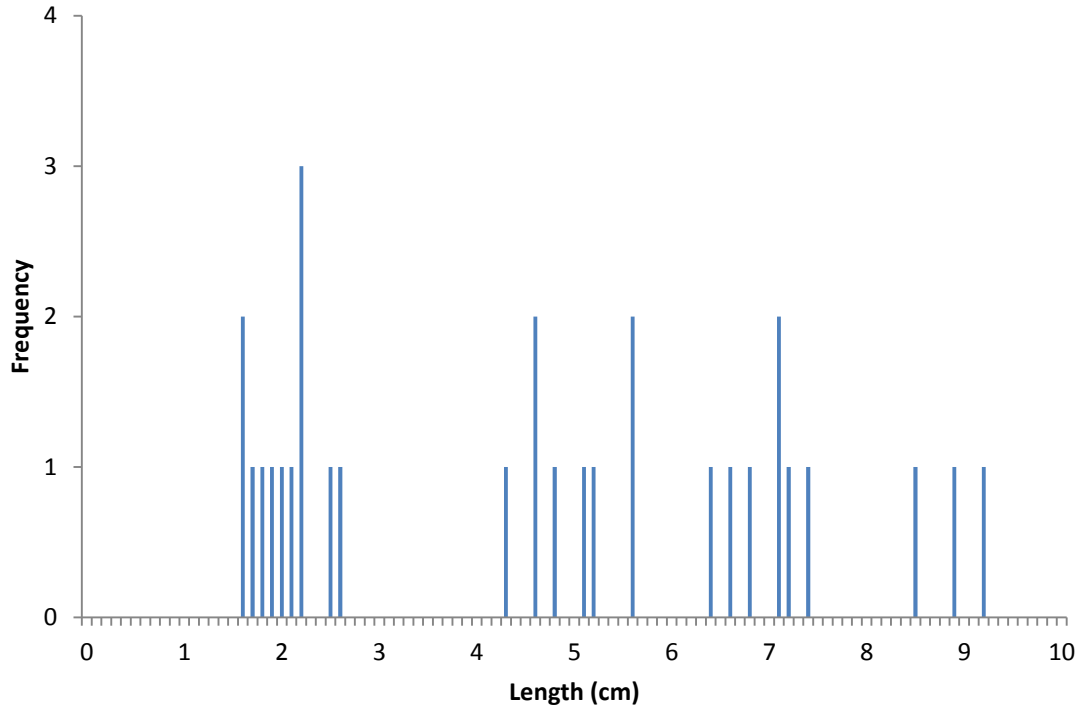


Figure 3.28. Length frequency of minnow captured at Pondhead Site 1 (n=30).

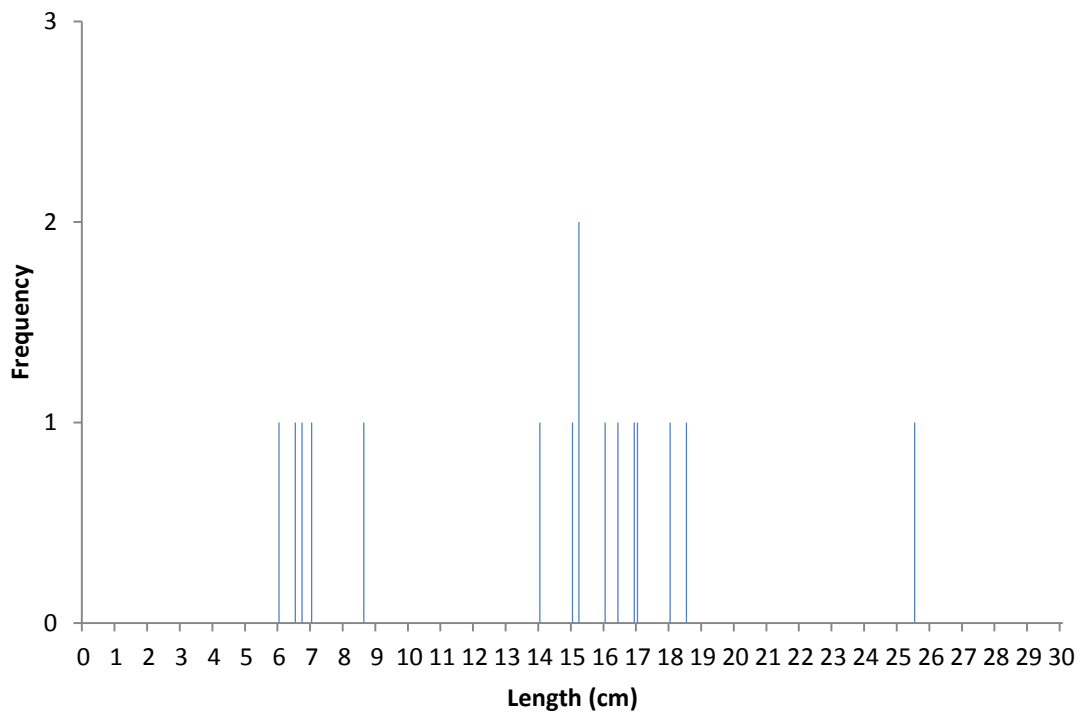


Figure 3.29. Length frequency of brown trout captured at Pondhead Site 1 (n=16).



### 3.11.3 Fish species of conservation importance

Table 3.36 highlights the fish species of conservation importance that were recorded at Pondhead Site 1 during the electric fishing survey.

**Table 3.36. Species of conservation importance that could potentially be present and species that were recorded during the fish survey at Pondhead Site 1.**

Species	Conservation designation	Within natural range? <sup>1</sup>	Recorded?
Brown trout / Sea trout	UK BAP (Priority Species)	Y	Y
Bullhead	Habitats Directive (Annex II)	Y	Y
Eel	EC Eel Regulation (Eels [England and Wales] Regulations, IUCN Red List (Critically Endangered), UK BAP (Priority Species)	Y	Y
Lamprey (Brook)	Habitats Directive (Annex II)	Y	Y
Lamprey (River)	Habitats Directive (Annex II)	Y <sup>2</sup>	N
Lamprey (Sea)	Habitats Directive (Annex II)	Y <sup>2</sup>	N
Salmon	UK BAP (Priority Species), Habitats Directive (Annex II)	Y <sup>3</sup>	N

<sup>1</sup> Natural range as summarised in Maitland (2004) distribution maps of fish occurring in the fresh waters of Britain and Ireland.

<sup>2</sup> River and sea lamprey are anadromous species found around the coast of the UK and, therefore, both species could potentially colonise the New Forest streams. However, it is generally accepted that brook lamprey is the only species to inhabit the New Forest streams. All lamprey recorded are, therefore, assumed to be brook lamprey.

<sup>3</sup> As an anadromous species, salmon have the ability to colonise any rivers with access to/from the sea. However, it is generally accepted that sea trout is the only migratory salmonid species present within the New Forest Streams.

### 3.12 Pondhead Site 2

#### 3.12.1 Site description

Pondhead Site 2 is located within an area of broadleaf / mixed woodland, with canopy cover along approximately 90 % of the surveyed river stretch (see Section 2.1.5). Table 3.37 below summarises the key physical characteristics of the 100 m survey site, and Appendix 12 provides a photographic record of habitat variability. The mean wetted width was 2.01 m, with an overall surveyed area of 200.9 m<sup>2</sup>.

The river reach comprised mainly shallow riffle habitat, with limited deeper pools. Substrate was largely comprised of gravel and pebble overlain on a layer of soft clay. Flow conditions during the survey were low.

Physico-chemical parameters recorded during the time of the survey are provided in Table 3.38.

**Table 3.37. Habitat data recorded during the electric fishing survey at Pondhead Site 2.**

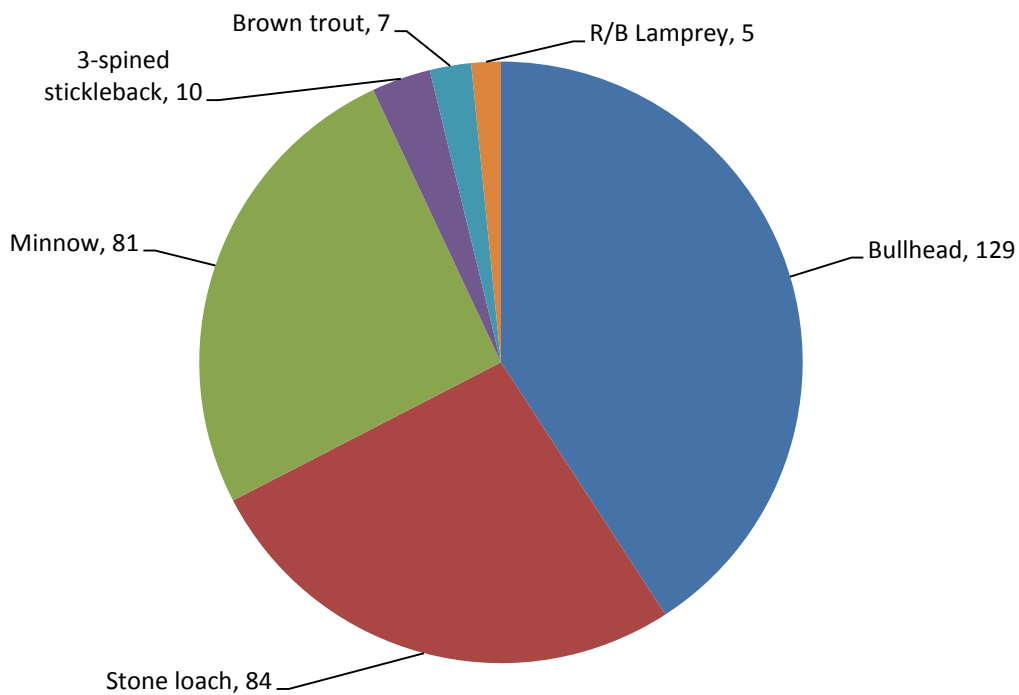
Depths (cm)	< 10	11 - 20	21 - 30	31 - 40	41 - 50	> 50		
Percent	20	30	20	10	10	10		
Substrate	Organic	Silt	Sand	Gravel	Pebble	Cobble	Boulder	Bedrock
Percent	10	10			80			
Instream vegetation: <b>10 %</b>		Silted? <b>Yes</b>		Substrate: <b>Unstable &amp; Uncompacted</b>				
Flow	SM	DP	SP	DG	SG	RU	RI	TO
Percent	10	10	10			20	50	
Speed / Level: <b>Low</b>	FLOW DEFINITIONS: SM <10cm still/eddy, smooth, silent; DP ≥30cm slow/eddy, smooth, silent; SP <30cm slow/eddy, smooth, silent; DG ≥30cm mod/fast, smooth, silent; SG <30cm mod/fast, smooth, silent; RU fast, unbroken waves, silent; RI fast, broken waves, audible; TO white water, noisy, substrate invisible							
Bankside cover	UC	DR	BA	MA	RT	RK	OTH	
Left bank %	5							
Right bank %	5							
Total LB fish cover: <b>5 %</b>	DEFINITIONS: UC undercut banks; DR vegetation rooted in riparian zone, branches/leaves touch or almost touch surface; BA no cover or fish can't get to cover due to lack of water; MA veg rooted in stream, excl fully aquatic veg; RT cover provided by exposed roots; RK cover from rocks within bank structure; OTH other bankside cover							
Total RB fish cover: <b>5 %</b>								
Bankside land use								
LB Bankface vegetation: Bare / Uniform / <b>Simple</b> / Complex				RB Bankface vegetation: Bare / Uniform / <b>Simple</b> / Complex				
LB Banktop vegetation: Bare / Uniform / <b>Simple</b> / Complex				RB Banktop vegetation: Bare / Uniform / <b>Simple</b> / Complex				
LB Overhanging Boughs (%): <b>0</b>			RB Overhanging Boughs (%): <b>0</b>			Canopy Cover (%): <b>100</b>		

**Table 3.38. Physico-chemical parameters recorded during fish survey at Pondhead Site 2.**

Parameter	Value
Temperature (°C)	15.2
Dissolved Oxygen (%)	89.5
Dissolved Oxygen (mg l <sup>-1</sup> )	8.99
Conductivity (µScm <sup>-1</sup> )	234.9
pH	7.27

### 3.12.2 Electric fishing survey results

A total of 316 fish were captured at Pondhead Site 2, comprising six species. Bullhead was the most abundant species captured, followed by stone loach and minnow (Figure 3.30).



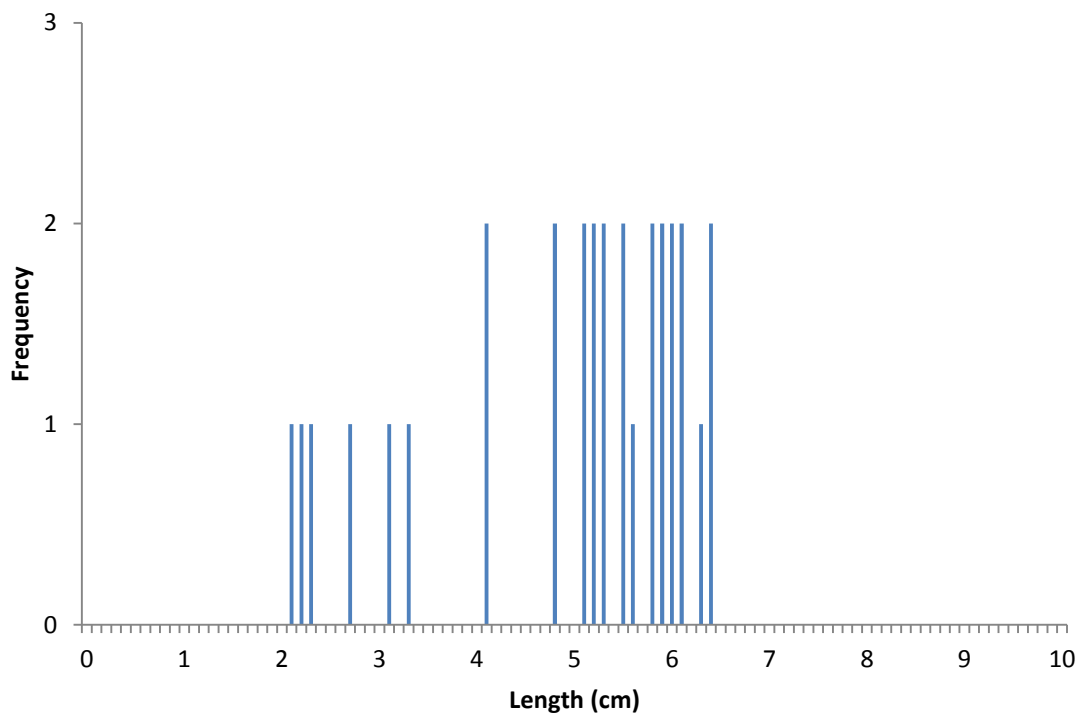
**Figure 3.30. Species composition (total number captured) at Pondhead Site 2.**

The total number captured, length range (cm) and catch depletion density estimate (where relevant) for each fish species are shown in Table 3.39. The National Fisheries Classification Scheme (NFCS) classifications for 0+ and 1++ brown trout are also shown.

**Table 3.39. Number captured and catch depletion estimates (Carle & Strub), including Upper and Lower 95 % Confidence Intervals, for all species recorded at Pondhead Site 2. National Fisheries Classification Scheme (NFCS) grades are also provided for brown trout.**

Species	No. captured (length range, cm)	Catch depletion population estimate	Catch depletion probability of capture	Catch depletion 95% LCI	Catch depletion 95% UCI	Catch depletion density (No./100m <sup>2</sup> )	NFCS Classification
Bullhead	129 (2.1 – 6.4)	160	0.56	128	192	80	N/A
Stone loach	84 (3.7 – 9.9)	93	0.68	81	105	46	N/A
Minnow	81 (4.7 – 9.5)	95	0.61	76	114	47	N/A
3-spined stickleback	10 (2.0 – 4.3)	10	0.83	9	11	5	N/A
R/B lamprey	5 (13.0 – 15.0)	5	1.00	5	5	2	N/A
Brown trout (0+)	5 (3.1 – 8.5)	5	1.00	5	5	2	E (Poor)
Brown trout (1++)	2 (14.2 – 15.8)	2	0.67	0	4	1	E (Poor)
<b>TOTAL</b>	<b>316</b>						

Length frequency charts for bullhead, stone loach, minnow and brown trout are provided in Figure 3.31 to Figure 3.34 below.



**Figure 3.31. Length frequency of bullhead captured at Pondhead Site 2 (n=30).**

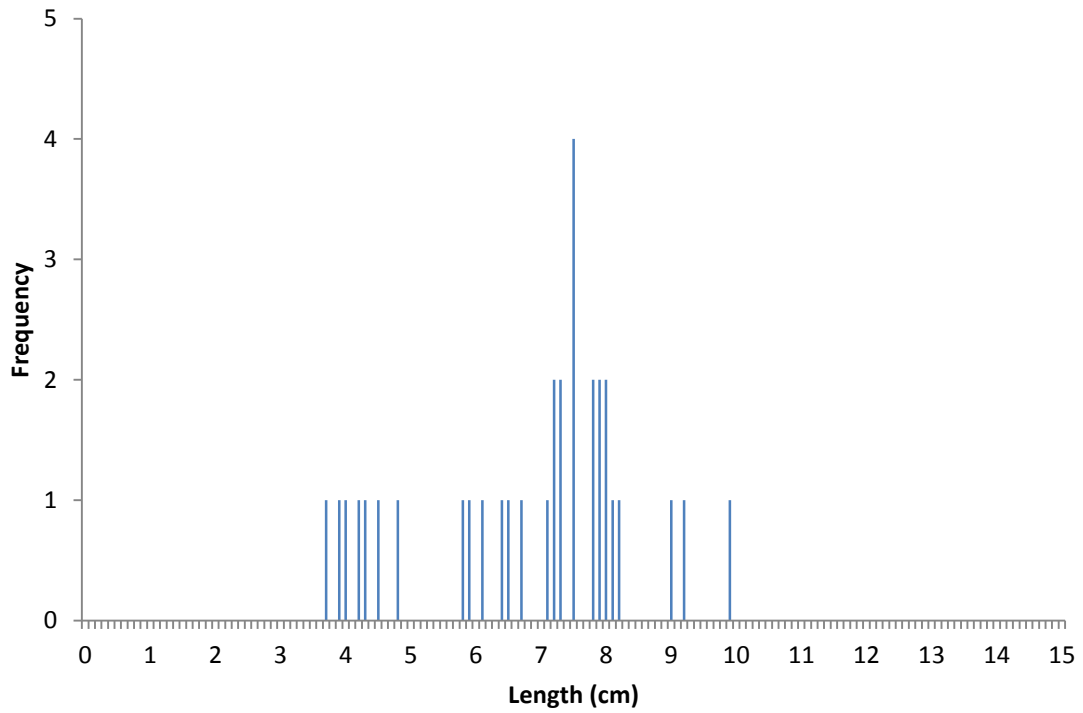


Figure 3.32. Length frequency of stone loach captured at Pondhead Site 2 (n=33).

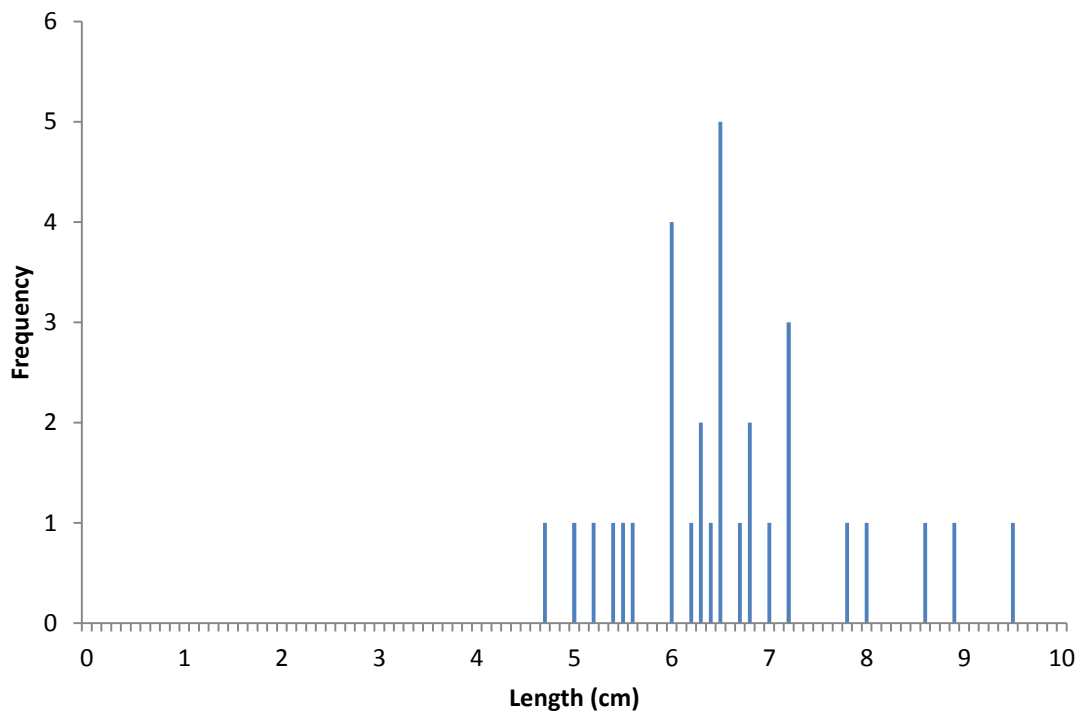
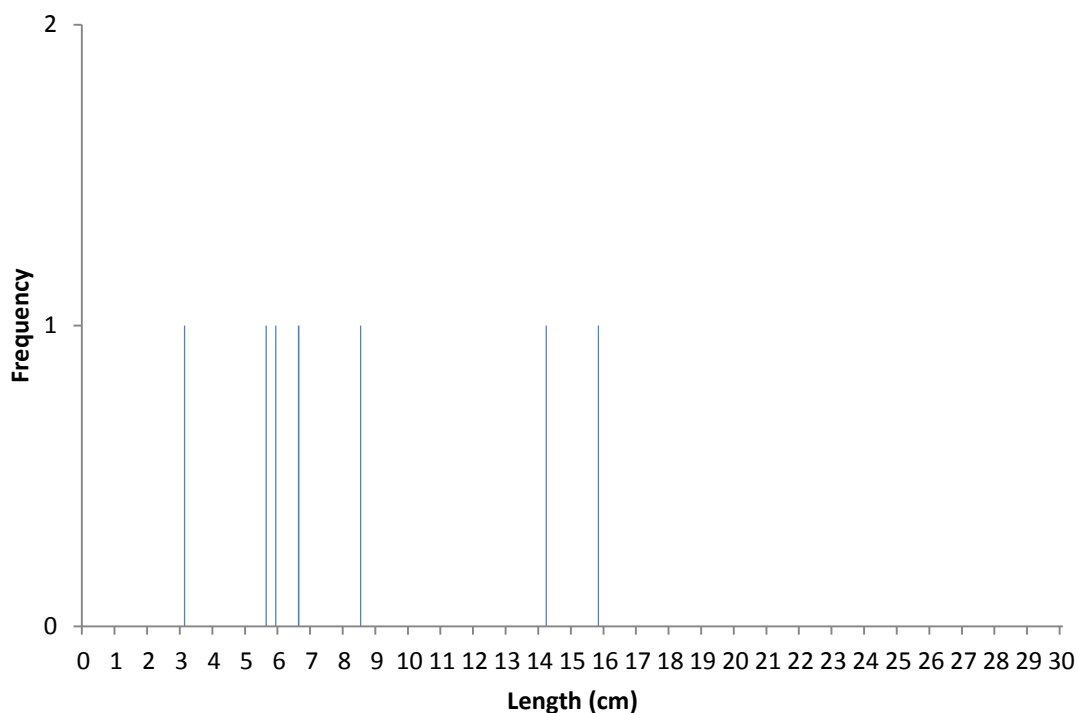


Figure 3.33. Length frequency of minnow captured at Pondhead Site 2 (n=31).



**Figure 3.34. Length frequency of brown trout captured at Pondhead Site 1 (n=7).**

### 3.12.3 Fish species of conservation importance

Table 3.40 highlights the fish species of conservation importance that were recorded at Pondhead Site 2 during the electric fishing survey.

**Table 3.40. Species of conservation importance that could potentially be present and species that were recorded during the fish survey at Pondhead Site 2.**

Species	Conservation designation	Within natural range? <sup>1</sup>	Recorded?
Brown trout / Sea trout	UK BAP (Priority Species)	Y	Y
Bullhead	Habitats Directive (Annex II)	Y	Y
Eel	EC Eel Regulation (Eels [England and Wales] Regulations, IUCN Red List (Critically Endangered), UK BAP (Priority Species)	Y	N
Lamprey (Brook)	Habitats Directive (Annex II)	Y	Y
Lamprey (River)	Habitats Directive (Annex II)	Y <sup>2</sup>	N
Lamprey (Sea)	Habitats Directive (Annex II)	Y <sup>2</sup>	N
Salmon	UK BAP (Priority Species), Habitats Directive (Annex II)	Y <sup>3</sup>	N

<sup>1</sup> Natural range as summarised in Maitland (2004) distribution maps of fish occurring in the fresh waters of Britain and Ireland.

<sup>2</sup> River and sea lamprey are anadromous species found around the coast of the UK and, therefore, both species could potentially colonise the New Forest streams. However, it is generally accepted that brook lamprey is the only species to inhabit the New Forest streams. All lamprey recorded are, therefore, assumed to be brook lamprey.

<sup>3</sup> As an anadromous species, salmon have the ability to colonise any rivers with access to/from the sea. However, it is generally accepted that sea trout is the only migratory salmonid species present within the New Forest Streams.

### 3.13 Pondhead Control

#### 3.13.1 Site description

Pondhead Control is located within an area of broadleaf / mixed woodland, with canopy cover along 100 % of the surveyed river stretch (see Section 2.1.5). Table 3.41 below summarises the key physical characteristics of the 100 m survey site, and Appendix 13 provides a photographic record of habitat variability. The mean wetted width was 1.55 m, with an overall surveyed area of 155.5 m<sup>2</sup>.

The straight river reach comprised an incised channel and exhibited mainly shallow habitat, with some deeper pools. Substrate was largely comprised of gravel and pebble. Flow conditions during the survey were low.

Physico-chemical parameters recorded during the time of the survey are provided in Table 3.42.

**Table 3.41. Habitat data recorded during the electric fishing survey at Pondhead Control.**

Depths (cm)	< 10	11 - 20	21 - 30	31 - 40	41 - 50	> 50		
Percent	50	10	10		20	10		
Substrate	Organic	Silt	Sand	Gravel	Pebble	Cobble	Boulder	Bedrock
Percent	10	10		30	50			
Instream vegetation: <b>0 %</b>		Silted? <b>Yes</b>		Substrate: <b>Stable &amp; Uncompacted</b>				
Flow	SM	DP	SP	DG	SG	RU	RI	TO
Percent		20	70				10	
Speed / Level: <b>Low</b>	FLOW DEFINITIONS: SM <10cm still/eddy, smooth, silent; DP ≥30cm slow/eddy, smooth, silent; SP <30cm slow/eddy, smooth, silent; DG ≥30cm mod/fast, smooth, silent; SG <30cm mod/fast, smooth, silent; RU fast, unbroken waves, silent; RI fast, broken waves, audible; TO white water, noisy, substrate invisible							
Bankside cover	UC	DR	BA	MA	RT	RK	OTH	
Left bank %	40	10			10			
Right bank %	40	10			10			
Total LB fish cover: <b>60 %</b>	DEFINITIONS: UC undercut banks; DR vegetation rooted in riparian zone, branches/leaves touch or almost touch surface; BA no cover or fish can't get to cover due to lack of water; MA veg rooted in stream, excl fully aquatic veg; RT cover provided by exposed roots; RK cover from rocks within bank structure; OTH other bankside cover							
Total RB fish cover: <b>60 %</b>								
Bankside land use								
LB Bankface vegetation: Bare / Uniform / Simple / <b>Complex</b>				RB Bankface vegetation: Bare / Uniform / Simple / <b>Complex</b>				
LB Banktop vegetation: Bare / Uniform / Simple / <b>Complex</b>				RB Banktop vegetation: Bare / Uniform / Simple / <b>Complex</b>				
LB Overhanging Boughs (%): <b>20</b>			RB Overhanging Boughs (%): <b>20</b>			Canopy Cover (%): <b>100</b>		

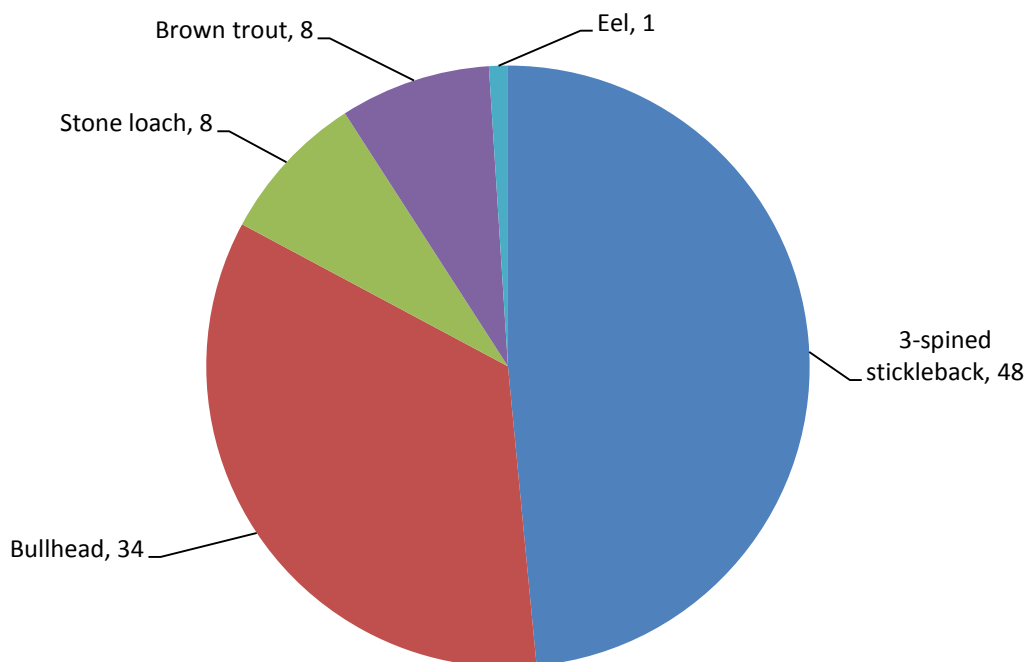


**Table 3.42. Physico-chemical parameters recorded during fish survey at Pondhead Control.**

Parameter	Value
Temperature (°C)	14.6
Dissolved Oxygen (%)	78.0
Dissolved Oxygen (mg l <sup>-1</sup> )	7.93
Conductivity (µScm <sup>-1</sup> )	310.3
pH	7.35

### 3.13.2 Electric fishing survey results

A total of 99 fish were captured at Pondhead Control, comprising five species. Three-spined stickleback was the most abundant species captured, followed by bullhead (Figure 3.35).



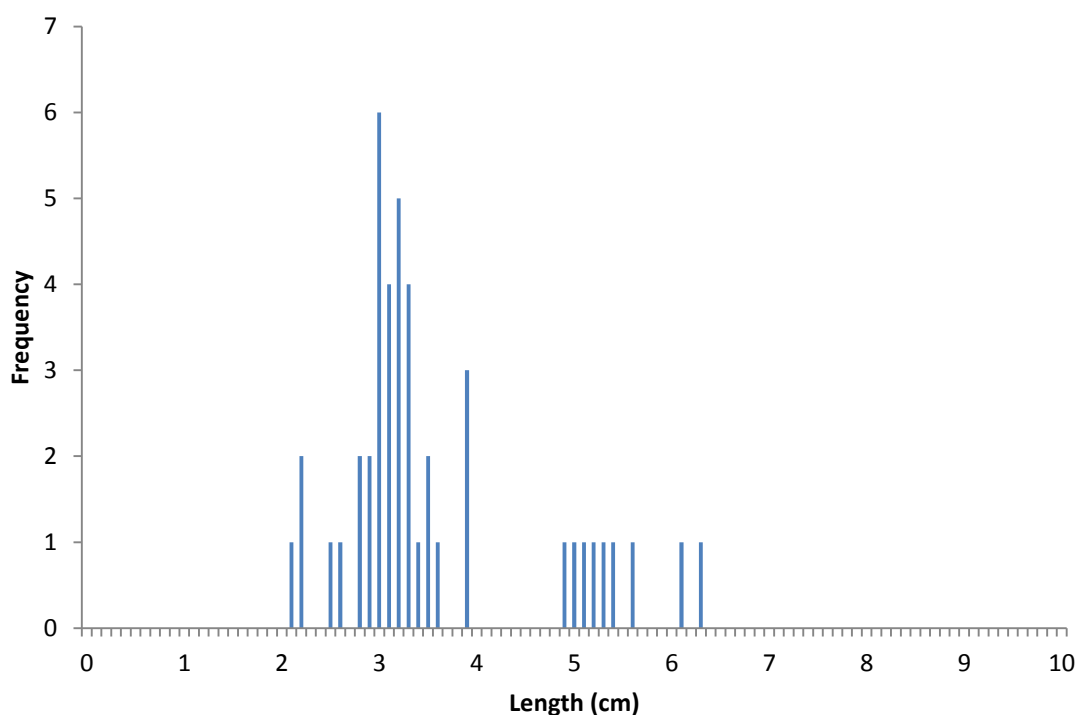
**Figure 3.35. Species composition (total number captured) at Pondhead Control.**

The total number captured, length range (cm) and catch depletion density estimate (where relevant) for each fish species are shown in Table 3.43. The National Fisheries Classification Scheme (NFCS) classifications for 0+ and 1++ brown trout are also shown.

**Table 3.43. Number captured and catch depletion estimates (Carle & Strub), including Upper and Lower 95 % Confidence Intervals, for all species recorded at Pondhead Control. National Fisheries Classification Scheme (NFCS) grades are also provided for brown trout.**

Species	No. captured (length range, cm)	Catch depletion population estimate	Catch depletion probability of capture	Catch depletion 95% LCI	Catch depletion 95% UCI	Catch depletion density (No./100m <sup>2</sup> )	NFCS Classification
3-spined stickleback	48 (2.1 – 6.3)	74	0.40	23	125	48	N/A
Bullhead	34 (3.1 – 8.6)	68	0.29	-31	167	44	N/A
Stone loach	8 (5.5 – 11.9)	10	0.50	-1	21	6	N/A
Brown trout (0+)	5 (6.5 – 8.2)	5	1.00	5	5	3	D (Fair/Poor)
Brown trout (1++)	3 (15.1 – 16.5)	3	1.00	3	3	2	D (Fair/Poor)
Eel	1 (33.0)	1	0.50	-2	4	1	N/A
<b>TOTAL</b>	<b>99</b>						

Length frequency charts 3-spined stickleback, bullhead and brown trout are provided in Figure 3.36 to Figure 3.38 below.



**Figure 3.36. Length frequency of 3-spined stickleback captured at Pondhead Control (n=44).**

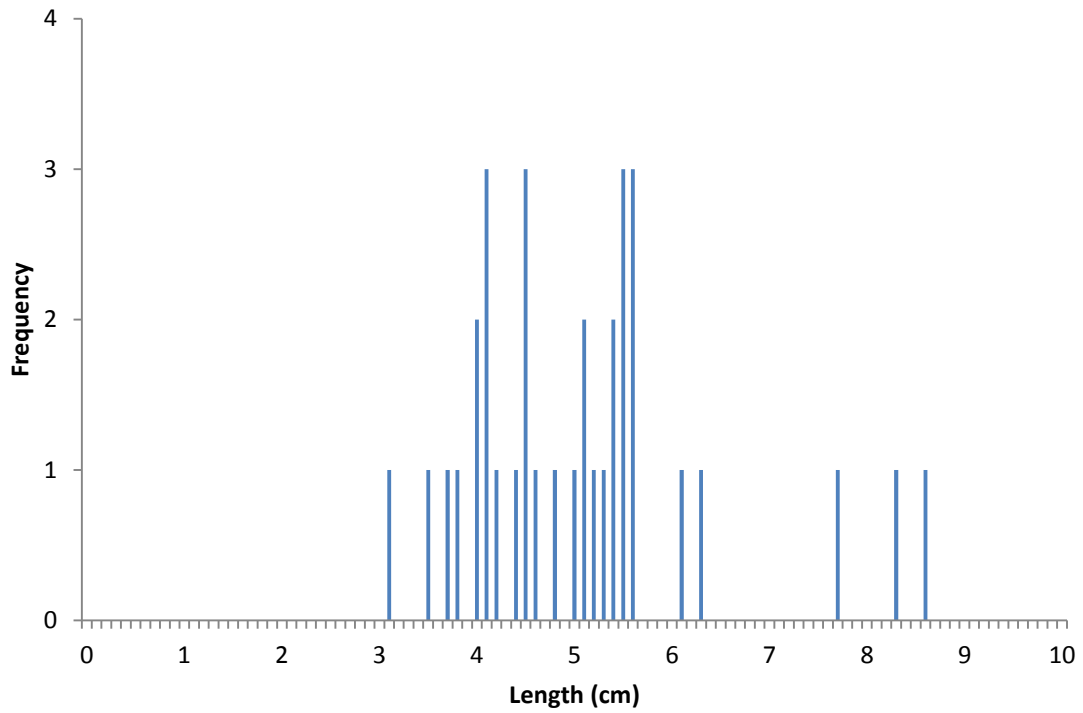


Figure 3.37. Length frequency of bullhead captured at Pondhead Control (n=34).

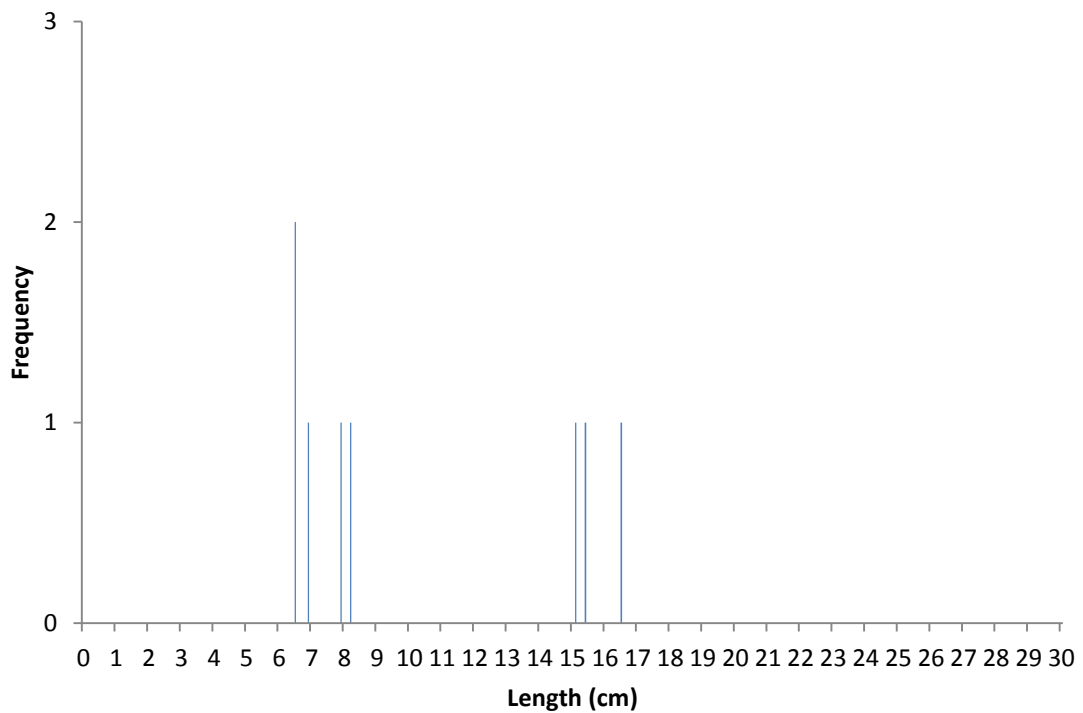


Figure 3.38. Length frequency of brown trout captured at Pondhead Control (n=8).

### 3.13.3 Fish species of conservation importance

Table 3.44 highlights the fish species of conservation importance that were recorded at Pondhead Control during the electric fishing survey.

**Table 3.44. Species of conservation importance that could potentially be present and species that were recorded during the fish survey at Pondhead Control.**

Species	Conservation designation	Within natural range? <sup>1</sup>	Recorded?
Brown trout / Sea trout	UK BAP (Priority Species)	Y	Y
Bullhead	Habitats Directive (Annex II)	Y	Y
Eel	EC Eel Regulation (Eels [England and Wales] Regulations, IUCN Red List (Critically Endangered), UK BAP (Priority Species)	Y	Y
Lamprey (Brook)	Habitats Directive (Annex II)	Y	N
Lamprey (River)	Habitats Directive (Annex II)	Y <sup>2</sup>	N
Lamprey (Sea)	Habitats Directive (Annex II)	Y <sup>2</sup>	N
Salmon	UK BAP (Priority Species), Habitats Directive (Annex II)	Y <sup>3</sup>	N

<sup>1</sup> Natural range as summarised in Maitland (2004) distribution maps of fish occurring in the fresh waters of Britain and Ireland.

<sup>2</sup> River and sea lamprey are anadromous species found around the coast of the UK and, therefore, both species could potentially colonise the New Forest streams. However, it is generally accepted that brook lamprey is the only species to inhabit the New Forest streams. All lamprey recorded are, therefore, assumed to be brook lamprey.

<sup>3</sup> As an anadromous species, salmon have the ability to colonise any rivers with access to/from the sea. However, it is generally accepted that sea trout is the only migratory salmonid species present within the New Forest Streams.

## 4. RESULTS – INVERTEBRATE SURVEYS

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### 4.1 Species composition

Macroinvertebrate species composition for each site is shown in Table 4.1.

Table 4.1. Macroinvertebrate species composition at all sites in the New Forest, surveyed during September 2020.

Group	Species	Dames Slough 1	Dames Slough 2	Ferry Croft Control	Ferry Croft Impact	Thompson Castle U/S	Thompson Castle D/S	Latchmore D/S	Latchmore Site 1	Latchmore U/S 2	Latchmore Control	Latchmore U/S	Millersford Brook 1	Millersford Brook 2	Millersford Brook 3	Millersford Control	Millersford U/S Control	Pondhead D/S	Pondhead Control	Redhill / Holmhill U/S	Redhill / Holmhill D/S	Redhill / Holmhill Control
Flatworms	Polycelis nigra group			8	1																	
Proboscis/Ribbon Worms	Nemertea sp.									1												
Snails	Potamopyrgus antipodarum (J.E.Gray, 1843)						1									120	51					
	Lymnaeidae sp.									1												
	Lymnaea sp.											3										
	Stagnicola palustris (O.F. Müller, 1774)						1															
	Omphiscola glabra (O.F. Müller, 1774)											1										
	Radix balthica (Linnaeus, 1758)				1	3			107		2	1		4	11							
	Planorbis (Planorbis) carinatus (O.F. Müller, 1774)								2													
	Bathyomphalus contortus (Linnaeus, 1758)								2													
	Gyraulus (Gyraulus) albus (O.F. Müller, 1774)								1						196							
	Hippeutis complanatus (Linnaeus, 1758)														1							
Bivalves	Ancylus fluviatilis O.F. Müller, 1774								1						7							
	Sphaerium sp.						31													122		
Worms	Pisidium sp.			8	3	2	38	58	62	13	3	20		56	15	5	6	1			1	140
	Oligochaeta sp.	7	4	176	26	65	63	26	120	6	31	25	2	188	84	100	27	7	6	8	31	356
Leeches	Glossiphonia complanata (Linnaeus, 1758)					1	8		4					12	5						1	
	Helobdella stagnalis (Linnaeus, 1758)			2	1		2							3		10						
	Erpobdellidae sp.				3				3							1		1				
	Erpobdella octoculata (Linnaeus, 1758)								1					19	9						2	
	Trocheta sp.			1																		
Water Mites	Hydracarina sp.			1	1		1		1	1		2			1	1						
Water Fleas	Cladocera sp.													1								
Seed Shrimps	Ostracoda sp.						3		3	1				3								
Crustaceans	Asellus aquaticus (Linnaeus, 1758)			80	3		17		7					7	4			1	7		2	
	Crangonyx pseudogracilis Bousfield, 1958			92	35											50	47				29	
	Gammarus pulex (Linnaeus, 1758)				11		143		216				144	29				43			12	
Springtails	Collembola sp.					2						2	1									
Mayflies	Baetidae sp.				1									7	5	1						
	Baetis rhodani (Pictet, 1843-1845)								3							24	11					
	Centroptilum luteolum (Müller, 1776)													7	13							
	Leptophlebiidae sp.										17			3					1			
	Paraleptophlebia sp.									2				3	8	3	5				1	
	Ephemera sp.														1							
	Ephemera danica Müller, 1764						3		1					5								

Group	Species	Dames Slough 1	Dames Slough 2	Ferry Croft Control	Ferry Croft Impact	Thompson Castle U/S	Thompson Castle D/S	Latchmore D/S	Latchmore Site 1	Latchmore U/S 2	Latchmore Control	Latchmore U/S	Millersford Brook 1	Millersford Brook 2	Millersford Brook 3	Millersford Control	Millersford U/S Control	Pondhead D/S	Pondhead Control	Redhill / Holmhill U/S	Redhill / Holmhill D/S	Redhill / Holmhill Control
	Caenidae sp.													1								
	Caenis luctuosa group														7							
Stoneflies	Nemouridae sp.								2													
	Nemoura sp.				5				19					11	21	104	60	49				20
	Leuctra sp.									14						1	9					
	Leuctra fusca (Linnaeus, 1758)		2		1				7	1				1	3	159	44	6				2
	Chloroperlidae sp.															1						
Dragonflies and Damselflies	Odonata sp.													1								
	Platycnemis pennipes (Pallas, 1771)													11	85							
	Coenagrionidae sp.				51				5	23	8	1				4	4		1	5		
	Pyrrhosoma nymphula (Sulzer, 1776)	12																				
	Calopteryx sp.										1											
	Calopteryx virgo (Linnaeus, 1758)				2									1	22	1	5					5
	Cordulegaster boltonii (Donovan, 1807)		1		1					7		1	1				10					5
	Aeshna sp.															1		1		1		
	Anax imperator Leach, 1815															3						
	Libellulidae sp.					3					23		14									1
	Orthetrum sp.																				1	4
True Bugs	Hydrometra stagnorum (Linnaeus, 1758)												1									
	Veliidae sp.		1														2					
	Velia sp.			2																		
	Gerridae sp.				1		4				1											
	Gerris lacustris (Linnaeus, 1758)										1				6							
	Nepa cinerea Linnaeus, 1758													1								
	Notonecta glauca Linnaeus, 1758												2									
	Notonecta viridis Delcourt, 1909											1		1								
	Plea minutissima Leach, 1817											1										
	Corixidae sp.														1							
	Cymatia bondsdorffii (C.R.Sahlberg, 1819)												3									
	Sigara dorsalis (Leach, 1817)										1											
	Retrocorixa limitata (Fieber, 1848)														1							
	Water Beetles	Haliphus flavicollis Sturm, 1834														1						
Dytiscidae sp.							30						8	5	10			1				
Hydroporus sp.													3									
Hydroporus tessellatus (Drapiez, 1819)				1													1					
Stictonectes lepidus (Olivier, 1795)		5																				
Platambus maculatus (Linnaeus, 1758)															1							

Group	Species	Dames Slough 1	Dames Slough 2	Ferry Croft Control	Ferry Croft Impact	Thompson Castle U/S	Thompson Castle D/S	Latchmore D/S	Latchmore Site 1	Latchmore U/S 2	Latchmore Control	Latchmore U/S	Millersford Brook 1	Millersford Brook 2	Millersford Brook 3	Millersford Control	Millersford U/S Control	Pondhead D/S	Pondhead Control	Redhill / Holmhill U/S	Redhill / Holmhill D/S	Redhill / Holmhill Control
	Agabus didymus (Olivier, 1795)																					1
	Agabus guttatus (Paykull, 1798)		1																			
	Dytiscus semisulcatus O.F. Müller, 1776												1									
	Gyrinidae sp.								1													
	Helophorus sp.														1	1		1				
	Paracymus sp.																		1			
	Laccobius sp.																					1
	Hydrochus nitidicollis Mulsant, 1844			2					4									1				
	Hydraena sp.								1													
	Hydraena gracilis Germar, 1824																1					
	Limnebius sp.																	1				
	Elodes sp.								1								2	2				
	Dryops sp.				9					1				3	1							1
	Elmis aenea (Müller, 1806)															2						
	Limnius volckmari (Panzer, 1793)			1			2									2						
	Oulimnius sp.				9				23					16	37	140	47					2
	Oulimnius tuberculatus (Müller, 1806)				2				5						5	3	6					1
	Chrysomelidae sp.											1								1		
	Curculionidae sp.	1																				
Alderflies	Sialis lutaria (Linnaeus, 1758)										1			10	7							
Caddisflies	Trichoptera sp.														1	1						
	Rhyacophila dorsalis (Curtis, 1834)																2					
	Agraylea sp.										4											
	Hydroptila sp.														2							
	Oxyethira sp.				2						5	12			1							1
	Lype sp.																1					
	Polycentropodidae sp.		4							1							6	1				
	Cyrnus trimaculatus (Curtis, 1834)				5											1	9					
	Plectrocnemia conspersa (Curtis, 1834)															5						
	Polycentropus flavomaculatus (Pictet, 1834)															5	15					
	Polycentropus irroratus (Curtis, 1835)																6					
	Hydropsyche sp.																					2
	Hydropsyche angustipennis (Curtis, 1834)									7												
	Hydropsyche siltalai Döhler, 1963									2							12					
	Phryganeidae sp.										5	1			10							
	Lepidostoma hirtum (Fabricius, 1775)								82						1	4	2					6
	Limnephilidae sp.			3	3						1	3										



Group	Species	Dames Slough 1	Dames Slough 2	Ferry Croft Control	Ferry Croft Impact	Thompson Castle U/S	Thompson Castle D/S	Latchmore D/S	Latchmore Site 1	Latchmore U/S 2	Latchmore Control	Latchmore U/S	Millersford Brook 1	Millersford Brook 2	Millersford Brook 3	Millersford Control	Millersford U/S Control	Pondhead D/S	Pondhead Control	Redhill / Holmhill U/S	Redhill / Holmhill D/S	Redhill / Holmhill Control	
	Potamophylax group			2			4							17	1		1						
	Limnephilus lunatus Curtis, 1834			6							2			128	52								
	Goera pilosa (Fabricius, 1775)								2					2	1								
	Sericostomatidae sp.														1								
	Sericostoma personatum (Spence in Kirby & Spence, 1826)			7					17					3		4	16						
	Athripsodes sp.								5						2	3	5						
	Mystacides sp.		1								1	3		6	12	17	10					3	
	Mystacides azurea (Linnaeus, 1761)													3									
	Oecetis sp.															1							
	Oecetis testacea (Curtis, 1834)														1								
Butterflies and Moths	Pyralidae sp.			1	2						2	7									1		
True Flies	Tipulidae sp.			1									1			2							2
	Limoniidae sp.						1						1								1		
	Pediciidae sp.		1						2								1		1				
	Ptychopteridae sp.						27																
	Dixidae sp.			1													1		1				
	Ceratopogonidae sp.				1		1							1		2	1						3
	Simuliidae sp.							5	2	24		1					5						2
	Chironomidae sp.	3	1	76	72	4	79	6	56	4	49	31	63	64	360	92	107	18	5	14	8	64	
	Tabanidae sp.				1				6		1			9	1	2	1		1				
	Empididae sp.															2							
	Syrphidae sp.																						1
<b>Total number of species</b>		<b>15</b>	<b>5</b>	<b>9</b>	<b>20</b>	<b>27</b>	<b>6</b>	<b>20</b>	<b>5</b>	<b>30</b>	<b>19</b>	<b>21</b>	<b>19</b>	<b>13</b>	<b>37</b>	<b>46</b>	<b>35</b>	<b>38</b>	<b>14</b>	<b>10</b>	<b>9</b>	<b>16</b>	

## 4.2 RIVPACS Predictor Variables

RIVPACS predictor variables for each site are provided in Table 4.2.

Table 4.2. RIVPACS environmental predictor variables for the September 2020 samples (input values for RIVPACS).

Variable	Dames Slough 1	Dames Slough 2	Ferny Croft Control	Ferny Croft Impact	Thompson Castle U/S	Thompson Castle D/S	Latchmore D/S	Latchmore Site 1	Latchmore U/S 2	Latchmore Control	Latchmore U/S	Millersford Brook 1	Millersford Brook 2	Millersford Brook 3	Millersford Control	Millersford U/S Control	Pondhead D/S	Pondhead Control	Redhill / Holmhill U/S	Redhill / Holmhill D/S	Redhill / Holmhill Control	
Sample date	15/09	15/09	17/09	17/09	10/09	10/09	10/09	10/09	11/09	11/09	11/09	14/09	14/09	14/09	11/09	14/09	16/09	17/09	17/09	17/09	17/09	
Method	K/S	K/S	K/S	K/S	K/S	K/S	K/S	K/S	K/S	K/S	K/S	K/S	K/S	K/S	K/S	K/S	K/S	K/S	K/S	K/S	K/S	K/S
Duration	3+1 min	3+1 min	3+1 min	3+1 min	3+1 min	3+1 min	3+1 min	3+1 min	3+1 min	3+1 min	3+1 min	3+1 min	3+1 min	3+1 min	3+1 min	3+1 min	3+1 min	3+1 min	3+1 min	3+1 min	3+1 min	3+1 min
Kick Sampler	VDA	VDA	CGR	CGR	AH	AH	CGR	VDA	VDA	VDA	CGR	VDA	VDA	CGR	VDA	AH	VDA	VDA	VDA	CGR	CGR	
Recorder	CGR	CGR	VDA	VDA	VDA	VDA	VDA	AH	CGR	AH	VDA	CGR	CGR	VDA	CGR	CGR	CGR	CGR	CGR	CGR	VDA	VDA
NGR	SU	SU	SU	SU	SU	SU	SU	SU	SU	SU	SU	SU	SU	SU	SU	SU	SU	SU	SU	SU	SU	SU
	24194	25091	37744	37977	18477	18527	18267	19081	21548	22037	22738	19565	18312	19071	19518	20300	32402	30877	26877	27069	26819	
	05024	04985	05555	05418	13063	12720	12470	12649	14036	14235	15944	17527	16191	16841	16719	17866	06908	07665	02294	02666	02262	
Altitude (m)	29	27	9	8	45	45	43	47	66	70	95	75	55	65	70	95	23	28	29	25	30	
Slope (m km <sup>-1</sup> )	2.8	2.8	5.0	5.0	6.5	6.5	6.2	6.2	8.3	8.3	22.0	14.0	11.0	10.0	13.0	20.0	5.0	4.0	7.1	7.1	7.1	
Discharge (category)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Velocity (category)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Distance from source (km)	3	4	0	0.3	5	5	7	6	3.3	2.7	0.5	1.3	3.2	2.2	1.9	0.5	3	0.7	0.3	0.8	0.2	
Mean width (m)	2.6	2.2	2.1	1.5	2.0	0.4	2.5	2.8	3.0	3.1	0.9	1.2	2.4	2.2	1.5	0.6	3.2	1.4	2.7	1.4	1.0	
Depth at ¼ width (cm)	14	30	15	9	15	5	43	34	22	6	4	1	14	4	15	5	5	5	8	47	28	
Depth at ½ width (cm)	20	32	15	6	10	5	26	34	25	12	4	1	17	5	20	5	3	5	5	47	28	
Depth at ¾ width (cm)	23	24	9	4	10	5	9	35	15	19	3	1	27	3	10	5	3	5	5	41	18	
Mean depth (cm)	19.0	28.7	13.0	6.3	11.7	5.0	26.0	34.3	20.7	12.3	3.7	1.0	19.3	4.0	15.0	5.0	3.7	5.0	6.0	45.0	24.7	
Boulders and cobbles (%)	0	40	0	0	0	0	15	10	40	20	10	5	45	60	20	0	0	0	0	0	0	
Pebbles and gravel (%)	30	50	50	50	5	50	80	70	40	40	70	70	35	35	30	100	50	90	45	60	0	
Sand (%)	0	0	5	5	0	50	0	10	10	10	0	0	0	0	0	0	0	0	5	10	0	
Silt and clay (%)	70	10	45	45	95	0	5	10	10	30	20	25	20	5	50	0	50	10	50	30	100	
pH	7.10	7.21	6.56	6.98	6.70	6.70	6.60	6.76	6.78	7.24	7.05	5.40	7.95	7.99	5.40	4.73	7.27	7.35	6.21	6.73	6.13	
Temperature (°C)	14.4	19.1	22.3	21.3	16.6	16.1	14.6	16.1	12.4	12.0	11.7	12.7	12.5	14.9	14.3	15.5	15.2	14.6	18.6	18.6	17.5	
Conductivity (µs)	128.7	144.8	189.6	179.0	65.0	65.0	67.1	71.0	95.2	127.8	472.9	54.0	300.9	388.0	56.4	72.7	234.9	310.3	88.0	88.4	87.1	
Dissolved Oxygen (%)	91.5	113.4	103.1	115.7	99.0	99.0	93.2	99.0	86.4	78.1	20.8	100.0	115.7	106.6	103.2	65.2	89.5	78.0	88.9	110.7	75.0	
Dissolved Oxygen (mg l <sup>-1</sup> )	9.35	10.49	8.95	10.26	9.74	9.74	9.47	9.74	9.23	8.41	2.25	10.30	12.30	10.81	10.56	6.50	8.99	7.93	8.31	10.35	7.18	
Water clarity	Turbid	Turbid	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Turbid	Clear	Clear	Clear	Clear	
Water colour	Humic	Humic	Humic	Clear	Clear	-	Humic	Humic	Humic	Humic	Humic	Humic	Clear	Clear	Humic	Humic	Humic	Humic	Humic	Humic	Humic	
Algae cover (%)	0	80	0	40	0	50	0	0	0	0	0	0	45	60	0	0	0	0	30	30	5	
Moss cover (%)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	
Higher plant cover (%)	0	20	5	20	90	40	0	0	0	0	0	0	0	0	0	5	0	70	20	90		
Total cover (%)	0	100	5	60	90	90	0	0	0	0	0	0	45	60	0	0	5	0	100	60	95	
Detritus	Absent	Present	Present	Absent	Absent	Absent	Absent	Absent	Present	Present	Present	Present	Present	Present	Absent	Present	Present	Present	Present	Present	Present	

### 4.3 RIVPACS Stream Type Associations

RIVPACS stream type associations for each site are provided in Table 4.3.

Table 4.3. Stream type (environmental end-group associations) for the September 2020 RIVPACS samples (output values from RIVPACS; associations <0.01 not shown).

End Group	Dames Slough 1	Dames Slough 2	Ferry Croft Control	Ferry Croft Impact	Thompson Castle U/S	Thompson Castle D/S	Latchmore D/S	Latchmore Site 1	Latchmore U/S 2	Latchmore Control	Latchmore U/S	Millersford Brook 1	Millersford Brook 2	Millersford Brook 3	Millersford Control	Millersford U/S Control	Pondhead D/S	Pondhead Control	Redhill / Holmhill U/S	Redhill / Holmhill D/S	Redhill / Holmhill Control
1																					
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					
13																					
14																					
15																					
16																					
17																					
18																					
19																					
20																					
21						0.02								0.02							
22																					
23																					
24														0.01							
25		0.01				0.01	0.32	0.13	0.09	0.01					0.01						
26		0.02				0.02	0.12	0.06	0.14	0.06			0.11	0.05	0.01						
27		0.64	0.01	0.01		0.38	0.26	0.20	0.69	0.56			0.68	0.69	0.64	0.12	0.05	0.81		0.81	
28						0.16							0.01	0.20							
29						0.31	0.02	0.01	0.01	0.01					0.06						
30			0.99	0.99		0.03					1.00	1.00			0.01	0.87	0.01	0.18	0.98		1.00
31																					
32																					
33																					
34																					
35														0.02			0.01				

End Group	Dames Slough 1	Dames Slough 2	Ferry Croft Control	Ferry Croft Impact	Thompson Castle U/S	Thompson Castle D/S	Latchmore D/S	Latchmore Site 1	Latchmore U/S 2	Latchmore Control	Latchmore U/S	Millersford Brook 1	Millersford Brook 2	Millersford Brook 3	Millersford Control	Millersford U/S Control	Pondhead D/S	Pondhead Control	Redhill / Holmhill U/S	Redhill / Holmhill D/S	Redhill / Holmhill Control	
36																						
37																						
38																	0.03					
39	0.02				0.12	0.02		0.01		0.02			0.05		0.06		0.10			0.01		
40	0.97	0.32			0.88	0.06	0.26	0.58	0.06	0.33			0.13		0.21		0.81			0.17		
41																						
42																						
43																						
Probability of model fit	>5%	>5%	<0.1%	<0.1%	<1%	<0.1%	>5%	>5%	>5%	>5%	>5%	<0.1%	>5%	>5%	>5%	>5%	<1%	>5%	<0.1%	<1%	<0.1%	
Suitability code	1	1	5	5	4	5	1	1	1	1	1	5	1	1	1	1	4	1	5	4	5	

#### 4.4 RIVPACS Biotic Indices

Observed biotic indices, expected biotic indices and Observed/Expected ratios are provided in Table 4.4.

Table 4.4. Observed, Expected (reference condition), and Observed/Expected (O/E) ratios for the September 2020 RIVPACS samples. Colour key: **Blue** = Better than expected ( $\geq 1.300$ ), **White** = Within expected range (0.700 – 1.299), **Yellow** = Slightly degraded (0.500 – 0.699), **Orange** = Moderately degraded (0.300 – 0.499), **Red** = Very degraded ( $< 0.300$ ).

Biotic Index	Dames Slough 1	Dames Slough 2	Fenny Croft Control	Fenny Croft Impact	Thompson Castle U/S	Thompson Castle D/S	Latchmore D/S	Latchmore Site 1	Latchmore U/S 2	Latchmore Control	Latchmore U/S	Millersford Brook 1	Millersford Brook 2	Millersford Brook 3	Millersford Control	Millersford U/S Control	Pondhead D/S	Pondhead Control	Redhill / Holmhill U/S	Redhill / Holmhill D/S	Redhill / Holmhill Control
<b>OBSERVED biotic index values</b>																					
TL1 BMWP	157	205	11	20	25	63	81	107	57	63	40	48	170	128	14	37	134	61	79	80	80
TL1 NTAXA	27	34	4	6	6	13	14	21	12	14	8	8	27	21	4	8	24	14	14	14	14
TL1 ASPT	5.815	6.029	2.750	3.333	4.167	4.846	5.786	5.095	4.750	4.500	5.000	6.000	6.296	6.095	3.500	4.625	5.583	4.357	5.643	5.714	5.714
TL2 WHPT Score (AbW,DistFam)	158.1	198.3	12.5	19.0	21.2	71.7	84.0	128.2	75.3	73.4	51.0	53.2	197.3	151.3	13.1	36.0	153.8	70.9	65.2	74.8	83.4
TL2 WHPT NTAXA (AbW,DistFam)	29	35	4	6	6	15	15	24	13	16	10	9	31	24	4	8	26	16	14	15	14
TL2 WHPT ASPT (AbW,DistFam)	5.452	5.666	3.125	3.167	3.533	4.780	5.600	5.342	5.792	4.587	5.100	5.911	6.365	6.304	3.275	4.500	5.915	4.431	4.657	4.987	5.957
TL5 AWIC(Sp) Murphy	6.667	6.833				4.500	6.667	6.000	9.000	7.000		5.000	6.667	6.857		5.000	7.500	8.000	5.000	3.000	5.500
TL5 WFD AWIC(Sp) Mcfarland	9.333	9.167				6.000	8.667	8.333	13.000	9.000		7.000	8.889	9.143		7.000	10.167	11.333	7.000	5.000	7.500
TL5 LIFE(Sp)	6.529	6.571	8.000	6.000		7.250	6.889	6.727	7.667	6.250	6.000	8.000	7.833	7.429	5.500	6.250	7.235	6.750	7.333	6.000	8.200
TL5 PSI(Sp)	25.641	30.435				37.500	26.087	55.556	17.647		60.000	59.459	57.692	25.000		45.455	25.000				41.667
TL5 SPEAR(Sp) %	38.198	33.401			12.485	2.907	28.613	25.804	19.934	33.792	35.111	22.948	42.457	38.702	32.790	16.407	29.826	28.115	28.161	32.334	8.276
TL5 CCI	9.706	10.714		1.000	25.000	15.000	8.333	9.545	1.000	1.250	1.000	16.667	10.312	8.929	35.000	8.250	3.938	1.250	7.500	1.000	5.250
<b>RIVPACS EXPECTED biotic index values</b>																					
TL1 BMWP	166.645	143.731	85.196	85.056	161.186	133.809	153.193	157.968	138.696	144.559	84.842	84.918	137.257	131.489	138.476	90.699	158.106	123.261	85.722	137.857	84.805
TL1 NTAXA	29.059	24.403	15.274	15.254	28.322	22.519	25.323	26.857	22.952	24.547	15.223	15.234	23.138	22.161	23.558	16.077	27.803	20.841	15.352	23.314	15.218
TL1 ASPT	5.700	5.866	5.556	5.555	5.639	5.910	6.034	5.867	6.009	5.866	5.553	5.554	5.899	5.895	5.845	5.600	5.635	5.857	5.560	5.881	5.553
TL2 WHPT Score (AbW,DistFam)	189.402	169.564	102.751	102.579	183.430	161.721	181.331	183.442	166.596	170.360	102.325	102.417	163.696	158.374	164.411	109.390	180.382	148.604	103.381	164.150	102.278
TL2 WHPT NTAXA (AbW,DistFam)	32.581	27.591	17.213	17.189	31.760	25.375	28.288	30.097	25.882	27.701	17.153	17.165	26.135	25.012	26.665	18.147	31.181	23.696	17.303	26.456	17.147
TL2 WHPT ASPT (AbW,DistFam)	5.789	6.162	5.952	5.950	5.737	6.365	6.427	6.115	6.434	6.166	5.949	5.950	6.266	6.322	6.168	5.995	5.750	6.241	5.955	6.211	5.948
TL5 AWIC(Sp) Murphy	6.600	6.628	6.160	6.158	6.659	6.761	6.691	6.642	6.675	6.649	6.156	6.157	6.686	6.668	6.678	6.216	6.660	6.548	6.165	6.632	6.156
TL5 WFD AWIC(Sp) Mcfarland	9.246	9.202	8.698	8.696	9.351	9.359	9.216	9.226	9.209	9.234	8.694	8.695	9.271	9.237	9.277	8.754	9.347	9.091	8.703	9.197	8.694
TL5 LIFE(Sp)	7.580	8.091	8.435	8.435	7.591	8.346	8.179	7.906	8.339	8.084	8.436	8.435	8.231	8.347	8.144	8.422	7.632	8.340	8.433	8.186	8.436
TL5 PSI(Sp)	52.239	67.115	75.225	75.224	52.167	74.330	71.230	62.361	74.748	66.881	75.237	75.236	70.994	74.107	68.453	75.068	53.330	73.959	75.203	69.804	75.234
TL5 SPEAR(Sp) %	41.442	45.301	36.409	36.373	40.251	42.074	46.245	44.056	47.443	45.021	36.329	36.341	45.776	45.319	44.272	37.660	40.253	44.978	36.524	45.873	36.318
TL5 CCI	11.751	9.849	14.467	14.486	11.429	10.864	10.913	11.145	9.572	9.992	14.510	14.503	9.471	9.927	9.698	13.802	11.248	9.874	14.405	9.345	14.515
<b>OBSERVED/EXPECTED ratios</b>																					
TL1 BMWP	0.942	1.426	0.129	0.235	0.155	0.471	0.529	0.677	0.411	0.436	0.471	0.565	1.239	0.973	0.101	0.408	0.848	0.495	0.922	0.580	0.943
TL1 NTAXA	0.929	1.393	0.262	0.393	0.212	0.577	0.553	0.782	0.523	0.570	0.526	0.525	1.167	0.948	0.170	0.498	0.863	0.672	0.912	0.600	0.920
TL1 ASPT	1.020	1.028	0.495	0.600	0.739	0.820	0.959	0.868	0.791	0.767	0.900	1.080	1.067	1.034	0.599	0.826	0.991	0.744	1.015	0.972	1.029
TL2 WHPT Score (AbW,DistFam)	0.835	1.169	0.122	0.185	0.116	0.443	0.463	0.699	0.452	0.431	0.498	0.519	1.205	0.955	0.080	0.329	0.853	0.477	0.631	0.456	0.815
TL2 WHPT NTAXA (AbW,DistFam)	0.890	1.269	0.232	0.349	0.189	0.591	0.530	0.797	0.502	0.578	0.583	0.524	1.186	0.960	0.150	0.441	0.834	0.675	0.809	0.567	0.816
TL2 WHPT ASPT (AbW,DistFam)	0.942	0.920	0.525	0.532	0.616	0.751	0.871	0.874	0.900	0.744	0.857	0.994	1.016	0.997	0.531	0.751	1.029	0.710	0.782	0.803	1.001
TL5 AWIC(Sp) Murphy	1.010	1.031	0.000	0.000	0.000	0.666	0.996	0.903	1.348	1.053	0.000	0.812	0.997	1.028	0.000	0.804	1.126	1.222	0.811	0.452	0.893
TL5 WFD AWIC(Sp) Mcfarland	1.009	0.996	0.000	0.000	0.000	0.641	0.940	0.903	1.412	0.975	0.000	0.805	0.959	0.990	0.000	0.800	1.088	1.247	0.804	0.544	0.863
TL5 LIFE(Sp)	0.861	0.812	0.948	0.711	0.000	0.869	0.842	0.851	0.919	0.773	0.711	0.948	0.952	0.890	0.675	0.742	0.948	0.809	0.870	0.733	0.972
TL5 PSI(Sp)	0.491	0.453	0.000	0.000	0.000	0.000	0.526	0.418	0.743	0.264	0.000	0.797	0.838	0.778	0.365	0.000	0.852	0.338	0.000	0.000	0.554



Biotic Index	Dames Slough 1	Dames Slough 2	Ferry Croft Control	Ferry Croft Impact	Thompson Castle U/S	Thompson Castle D/S	Latchmore D/S	Latchmore Site 1	Latchmore U/S 2	Latchmore Control	Latchmore U/S	Millersford Brook 1	Millersford Brook 2	Millersford Brook 3	Millersford Control	Millersford U/S Control	Pondhead D/S	Pondhead Control	Redhill / Holmhill U/S	Redhill / Holmhill D/S	Redhill / Holmhill Control
TL5 SPEAR(Sp) %	0.922	0.737	0.000	0.000	0.310	0.069	0.619	0.586	0.420	0.751	0.966	0.631	0.928	0.854	0.741	0.436	0.741	0.625	0.771	0.705	0.228
TL5 CCI	0.826	1.088	0.000	0.069	2.187	1.381	0.764	0.856	0.104	0.125	0.069	1.149	1.089	0.899	3.609	0.598	0.350	0.127	0.521	0.107	0.362

#### 4.5 Species with conservation designations

Species recorded with one or more conservation designations are presented in Table 4.5.

**Table 4.5. Species found in the September 2020 RIVPACS samples with one or more current conservation designations.**

Species	Designation	Source	Sites recorded
<i>Cottus gobio</i> Linnaeus, 1758 Bullhead	Habitats Directive Annex 2	EC Habitats Directive 1992, European Community Council Directive 92/43/EEC	Pondhead D/S Dames Slough 2
<i>Omphiscola glabra</i> (O.F. Müller, 1774) Pond Mud Snail	BAP-2007	Biodiversity Action Plan UK list of priority species (2007)	Redhill / Holmhill U/S
	England_NERC_S.41	Species of principal importance in England (Section 41) under Natural Environment and Rural Communities Act (2006)	
<i>Hydrochus nitidicollis</i> Mulsant, 1844 Gravel Water Beetle	GB Red List (post 2001) – Vulnerable	Foster G.N. (2010) A review of the scarce and threatened Coleoptera of Great Britain part (3) – Water Beetles of Great Britain. Species Status 1. Joint Nature Conservation Committee, Peterborough	Latchmore Control Latchmore U/S 2 Pondhead D/S
	BAP-2007	Biodiversity Action Plan UK list of priority species (2007)	
	England_NERC_S.41	Species of principal importance in England (Section 41) under Natural Environment and Rural Communities Act (2006)	

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APPENDIX 1 – Dames Slough 1 photographs

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Figure A1.1. Typical habitat at Dames Slough 1 (Sept 2020).



Figure A1.2. Typical habitat at Dames Slough 1 (Sept 2020).



Figure A1.3. Typical habitat at Dames Slough 1 (Sept 2020).



Figure A1.4. Typical habitat at Dames Slough 1 (Sept 2020).



Figure A2.1. Typical habitat at Dames Slough 2 (Sept 2020).



Figure A2.2. Typical habitat at Dames Slough 2 (Sept 2020).



Figure A2.3. Typical habitat at Dames Slough 2 (Sept 2020).



Figure A2.4. Typical habitat at Dames Slough 2 (Sept 2020).



APPENDIX 3 – Latchmore Brook Site 1 photographs

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Figure A3.1. Typical habitat at Latchmore Brook Site 1 (Sept 2020).



Figure A3.2. Typical habitat at Latchmore Brook Site 1 (Sept 2020).



Figure A3.3. Typical habitat at Latchmore Brook Site 1 (Sept 2020).



Figure A3.4. Typical habitat at Latchmore Brook Site 1 (Sept 2020).



Figure A4.1. Typical habitat at Latchmore Brook Site 2 (Sept 2020).



Figure A4.2. Typical habitat at Latchmore Brook Site 2 (Sept 2020).



Figure A4.3. Typical habitat at Latchmore Brook Site 2 (Sept 2020).



Figure A4.4. Typical habitat at Latchmore Brook Site 2 (Sept 2020).



Figure A5.1. Typical habitat at Latchmore Brook Site 3 (Sept 2020).



Figure A5.2. Typical habitat at Latchmore Brook Site 3 (Sept 2020).



Figure A5.3. Typical habitat at Latchmore Brook Site 3 (Sept 2020).



Figure A5.4. Typical habitat at Latchmore Brook Site 3 (Sept 2020).

APPENDIX 6 – Latchmore Brook Site 4 photographs



Figure A6.1. Typical habitat at Latchmore Brook Site 4 (Sept 2020).



Figure A6.2. Typical habitat at Latchmore Brook Site 4 (Sept 2020).



Figure A6.3. Typical habitat at Latchmore Brook Site 4 (Sept 2020).



Figure A6.4. Typical habitat at Latchmore Brook Site 4 (Sept 2020).





Figure A7.1. Typical habitat at Millersford Bottom Site 1 (Sept 2020).



Figure A7.2. Typical habitat at Millersford Bottom Site 1 (Sept 2020).



Figure A7.3. Typical habitat at Millersford Bottom Site 1 (Sept 2020).



Figure A7.4. Typical habitat at Millersford Bottom Site 1 (Sept 2020).



Figure A8.1. Typical habitat at Millersford Bottom Site 2 (Sept 2020).



Figure A8.2. Typical habitat at Millersford Bottom Site 2 (Sept 2020).



Figure A8.3. Typical habitat at Millersford Bottom Site 2 (Sept 2020).



Figure A8.4. Typical habitat at Millersford Bottom Site 2 (Sept 2020).



Figure A9.1. Typical habitat at Millersford Bottom Site 3 (Sept 2020).



Figure A9.2. Typical habitat at Millersford Bottom Site 3 (Sept 2020).



Figure A9.3. Typical habitat at Millersford Bottom Site 3 (Sept 2020).



Figure A9.4. Typical habitat at Millersford Bottom Site 3 (Sept 2020).



Figure A10.1. Typical habitat at Millersford Fish Site 1 (Sept 2017).



Figure A10.2. Typical habitat at Millersford Fish Site 1 (Sept 2017).



Figure A11.1. Typical habitat at Pondhead Site 1 (Sept 2020).



Figure A11.2. Typical habitat at Pondhead Site 1 (Sept 2020).





Figure A11.3. Typical habitat at Pondhead Site 1 (Sept 2020).



Figure A11.4. Typical habitat at Pondhead Site 1 (Sept 2020).



Figure A12.1. Typical habitat at Pondhead Site 2 (Sept 2020).



Figure A12.2. Typical habitat at Pondhead Site 2 (Sept 2020).



Figure A12.3. Typical habitat at Pondhead Site 2 (Sept 2020).



Figure A12.4. Typical habitat at Pondhead Site 2 (Sept 2020).



Figure A13.1. Typical habitat at Pondhead Control (Sept 2020).



Figure A13.2. Typical habitat at Pondhead Control (Sept 2020).



Figure A13.3. Typical habitat at Pondhead Control (Sept 2020).



Figure A13.4. Typical habitat at Pondhead Control (Sept 2020).