

Water of Leith Electro-fishing 2022



Report prepared for Water of Leith Conservation Trust

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Quality management

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Executive Summary

Single pass electrofishing surveys were undertaken at 18 sites along the Water of Leith between Leith Head Mill in Balerno and Bonnington in Edinburgh by staff from the Forth Rivers Trust and the Water of Leith Conservation Trust.

The 12 core sites from previous surveys were completed, with the addition of 6 more “of interest” sites.

Table 1: List of species caught and scientific name

Species	Scientific name
Brown trout	<i>Salmo trutta</i>
Bullhead	<i>Cottus gobio</i>
Stoneloach	<i>Barbatula barbatula</i>
Minnow	<i>Phoxinus phoxinus</i>
Eel	<i>Anguilla Anguilla</i>
Three-spined stickleback	<i>Gasterosteus aculeatus</i>
Lamprey	<i>Lampetra planeri/Lampetra fluviatilis</i>

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1. Introduction

1.1. Background to the study

The Clyde River Foundation carried out a series of electrofishing surveys along the Water of Leith between 2009 and 2013 as part of Edinburgh Council flood defence improvement works. The fish communities were surveyed annually at 12 sites between Juniper Green and Bonnington. The Water of Leith Conservation Trust secured funding to repeat the surveys in the 2022 field season, in partnership with the Forth Rivers Trust.

The site locations are shown below in Figure 1.1. There were 12 original sites surveyed in all years when surveys were carried out. In 2010 and 2022, six additional sites were also surveyed. These six were in the upper catchment, upstream of Juniper Green and the Edinburgh bypass.

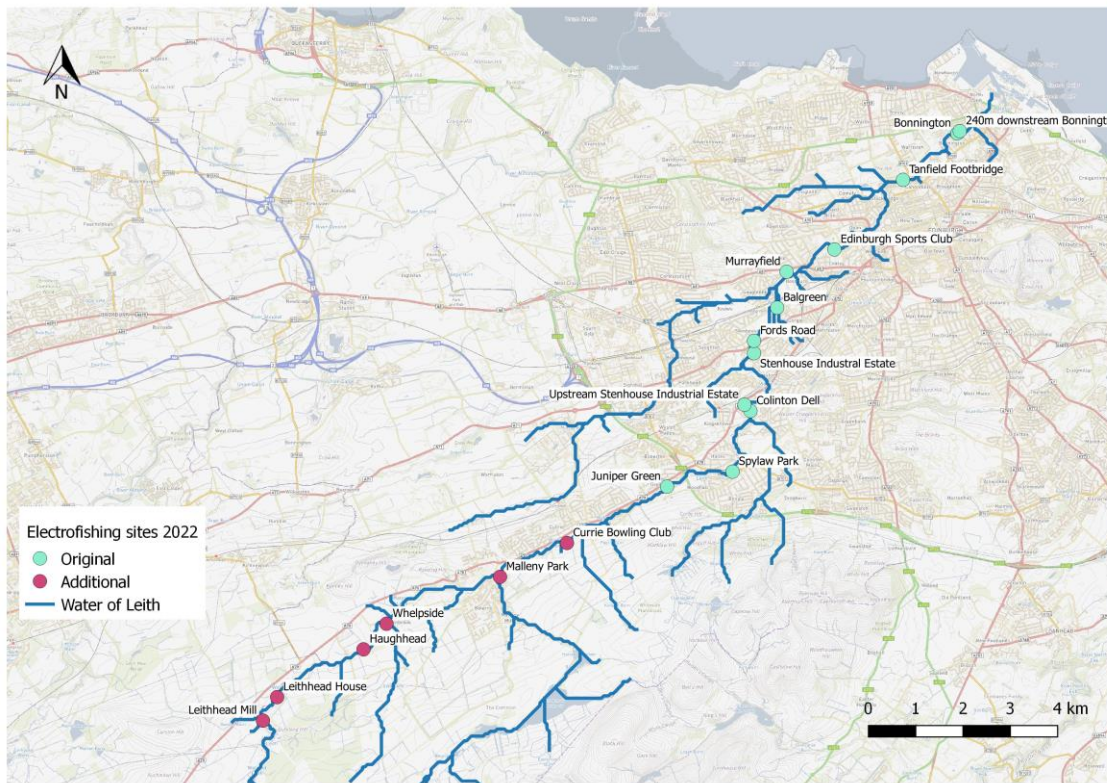


Figure 1.1. Electrofishing site locations, showing 12 original sites and six additional sites

2. Methodology

2.1. Field Surveys

Semi-quantitative fish surveys

Each site (shown in Figure 1.1 and Table 2.1) was electrofished semi-quantitatively over a defined area of riverbed with a single anode and no stop nets to determine what species were present and define the fish community.

Table 2.1 : Original sampling locations surveyed 2009-2013 by The Clyde River Foundation and repeated by FRT in 2022. Additional sites surveyed in 2010 and 2022

Easting	Northing	Original site or additional site	Site name
319963	668593	Original	Juniper Green
321349	668908	Original	Spylaw Park
918478	254023	Original	Colinton Dell
927738	256572	Original	Upstream Stenhouse Industrial Estate
321800	671410	Original	Stenhouse Industrial Estate
321800	671670	Original	Fords Road
322290	672370	Original	Balgreen
322490	673130	Original	Murrayfield
323500	673600	Original	Edinburgh Sports Club
324950	673070	Original	Tanfield Footbridge
326100	676050	Original	Bonnington
326150	676100	Original	240m downstream Bonnington Bridge
311420	663652	Additional	Leithhead Mill
811720	664148	Additional	Leithhead House
213819	664994	Additional	Haughead
214032	665697	Additional	Whelpside
316432	666687	Additional	Malleny Park
317847	667402	Additional	Currie Bowling Club

Each site location was systematically electro-fished from one end to the other using a two/three-person team. One team member worked the anode with one/two member of staff on hand and/or banner nets. An E-fish backpack electrofishing kit was used throughout the survey. Fish were kept in recovery buckets and released once they had been processed.

Targeted lamprey surveys were undertaken in suitable lamprey habitat i.e., fluvial deposits of high organic fine silt, to determine the presence or absence of lamprey species.

Across the 18 sites a qualified SFCC (Scottish Fisheries Coordination Centre) Team Leader from FRT led the survey. All team members are trained and experienced in electrofishing. SFCC protocols was followed when electrofishing. This refers particularly to safe use of equipment, safe working in water and best practise for fish processing and welfare.

The Water of Leith Conservation Trust provided a member of staff with SFCC Introduction to Electrofishing qualification.

The electrofishing surveys were roughly equivalent to the original surveys carried out by Clyde Foundation.

3. Results

3.1. Results table

Results are shown in Table 3.1. Sites, area surveyed and catches are displayed. Numbers of individual fish caught, from each species, are listed.

Table 3.1. Survey sites and catch per site

Site number/code	Site name	Area surveyed (m ²)	Brown Trout	Bullhead	Minnow	Eel	Lamprey	Stickle-back	Stone-loach
1	Juniper Green	140.5	11	94	1	0	1	0	0
2	Spylaw Park	220.5	8	24	0	0	0	0	0
3	U/S Bogs Bridge	48.0	11	76	0	0	0	0	0
4	U/S Senhouse Industrial Estate	42.7	0	41	0	0	0	0	0
5	Senhouse Industrial Estate	106.3	0	82	7	0	8	0	1
6	Fords Road	148.3	0	54	3	0	6	1	0
7	Balgreen	166.8	0	32	1	0	5	19	0
8	Murrayfield	137.0	0	19	6	0	2	21	0
9	Edinburgh Sports Club	123.7	0	48	1	0	0	0	0
10	Tanfield Footbridge	87.9	2	105	23	4	0	6	0
11	Bonnington	100.0	6	17	0	4	0	3	0
12	240m D/S Bonnington Bridge	88.8	6	28	1	11	0	0	0
A	Leithhead Mill	62.7	27	7	0	0	6	0	9
B	Leithhead House	198.8	17	50	0	0	1	1	7
C	Haghhead	120.9	17	35	45	0	8	2	37
D	Whelpside	119.0	12	44	17	0	0	4	53
E	Malleny Park	136.8	3	68	35	0	1	1	4
F	Currie Bowling Club	153.6	13	130	1	0	4	0	2

3.2. Results Summary

The below charts (Fig 3.1, Fig 3.2 and Fig 3.3) show the percentages of each species caught at the 12 original sites, 6 additional sites and percentages across all 18. Fig 3.4 shows the catch per m² of trout and bullhead population across all sites.

Brown trout were present in 12 sites. Six from the original 12 sites (totalling 44 trout) and present in all of the additional six sites (totalling 89).

Bullhead were present across all sites including the additional six sites. Bullhead was the only species present at all sites and made up 65% of the total fish caught across the survey.

Stoneloach were found in only one of the original 12 sites, but present in all of the additional sites.

Eel only makes up around 1% of the total survey catch, with 19 individual fish being caught. No eel were recorded in the additional six sites.

Spot checks for lamprey were carried out where lamprey habitat was present. Lamprey were present at 10 sites with a total of 42 fish. All lamprey caught were ammocoetes (juvenile lamprey) and therefore were not identified to species level.

Trout and bullhead numbers can be viewed per m² in Fig 3.4. This highlights that in all but one site the bullhead populations are higher than trout populations.

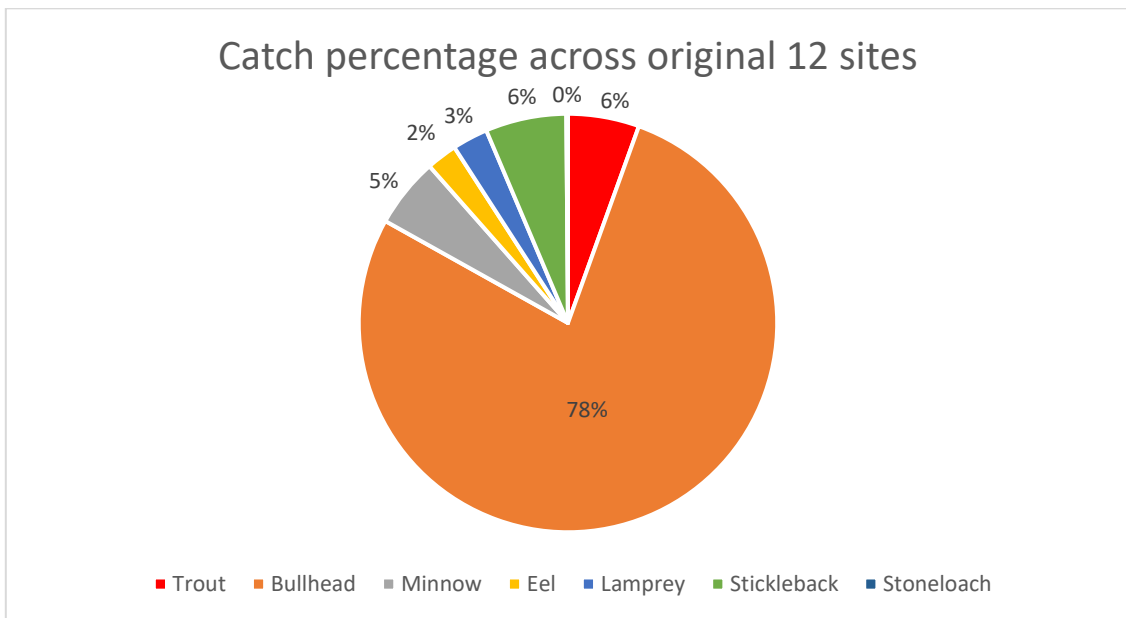


Fig 3.1. Shows the percentages of species caught at the 12 original sites.

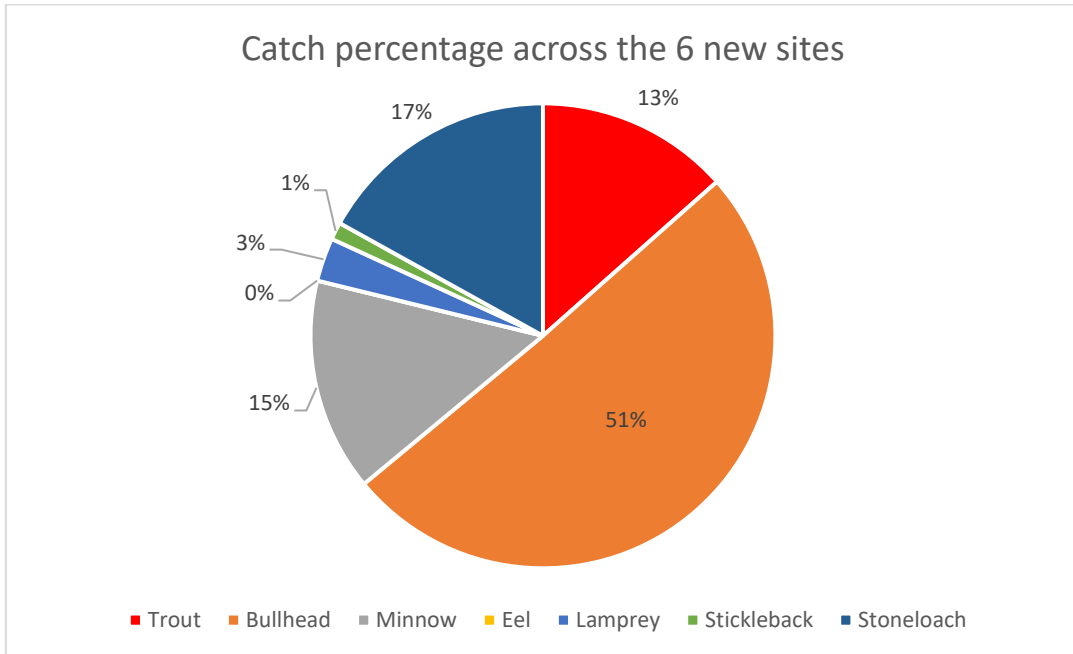


Fig 3.2. Shows the percentages of species caught at the 6 additional sites.

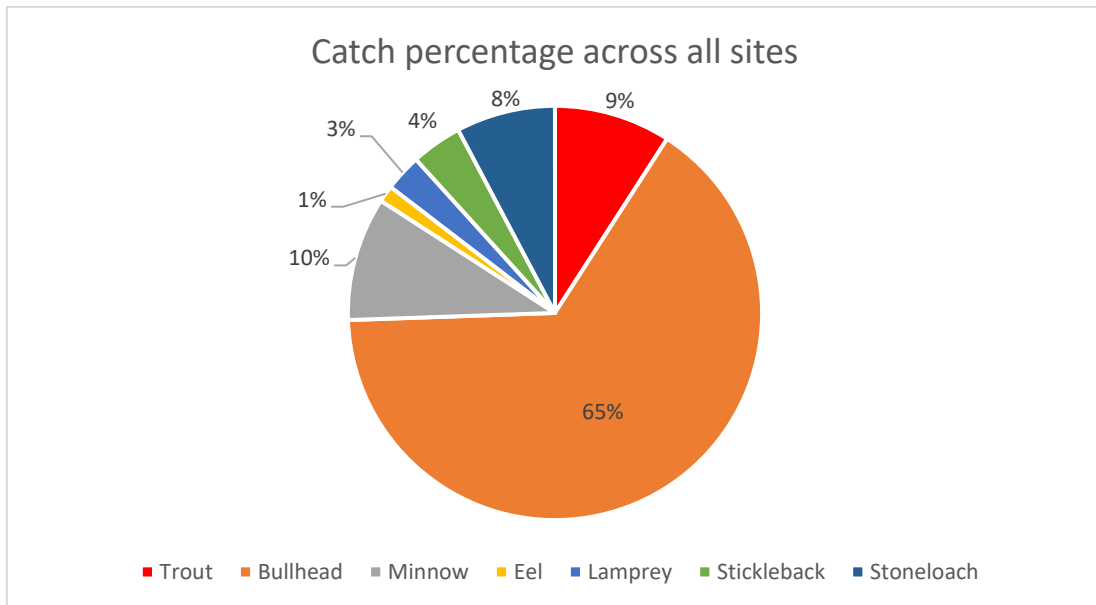


Fig 3.3. Shows the percentages of species caught across all sites.

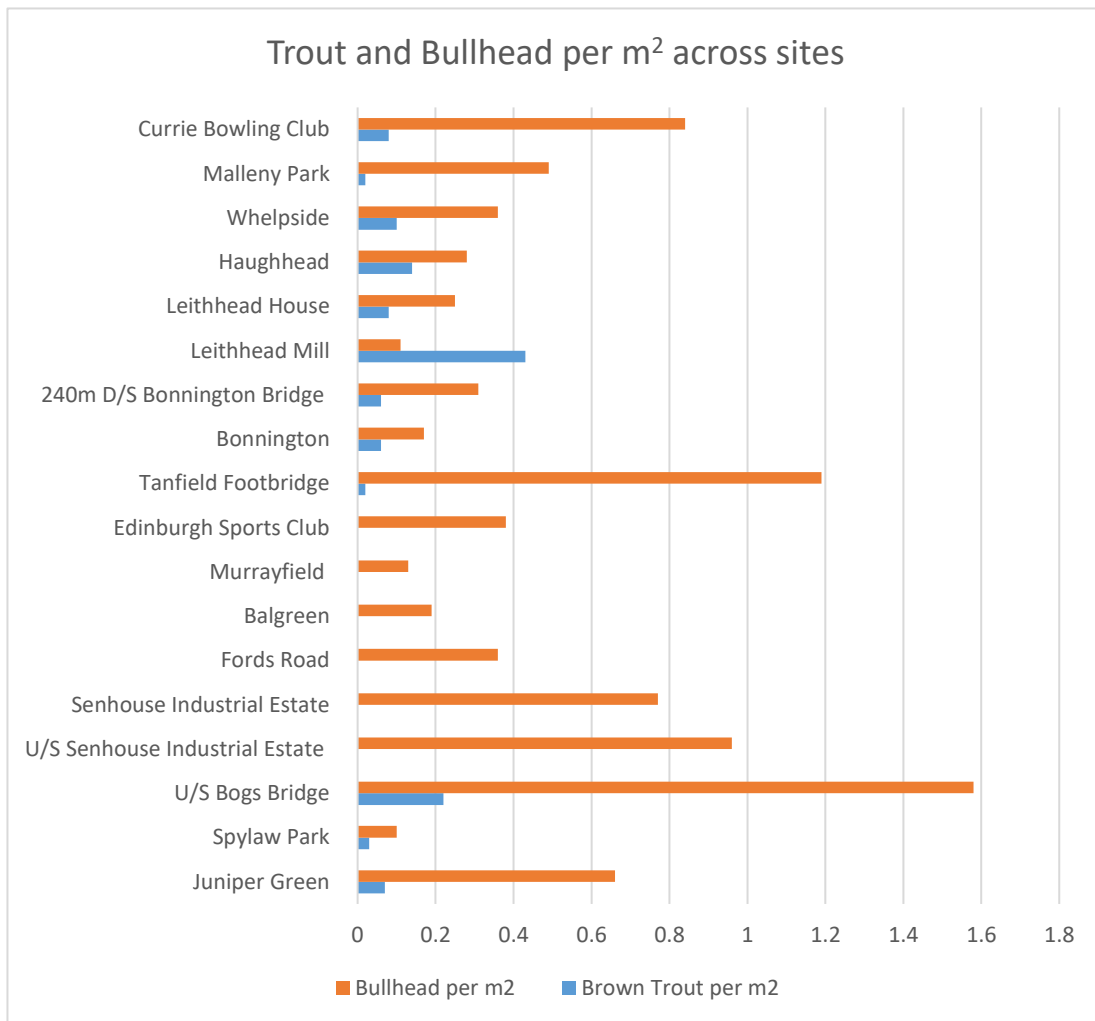


Fig 3.4. Trout and bullhead represented in per m² (number of individuals caught divided by site area) across all sites.

4. Discussion

Flounder, grayling and salmon were not caught in 2022. They were caught in the historical surveys carried out by Clyde Foundation (albeit in small numbers). Trout, bullhead, minnow, eel, lamprey, three-spined stickleback and stone loach were caught in 2022.

Bullhead were present at all sites in 2022. This is considerably higher than the 2010 survey that found only two sites with bullhead. In 2022, bullhead numbers were high relative to trout numbers across all sites (except one).

The highest proportions of trout and lamprey were found in the six additional sites (compare Figures 3.1 and 3.2). Note these additional six sites were in the upper catchment, outside the city limits. It is possible that the greater proportion of these species was due to habitat quality. Water quality, substrate compaction and sedimentation are likely to be in a more natural state outside the city, hence the healthier communities of these sensitive species.

The absence of Atlantic salmon is due to the extensive series of main stem barriers on the Water of Leith, not least the dock gates at Port of Leith. On occasion salmon fry have been found in the very bottom reaches of the Water of Leith, indicating that if and when the barriers are eased, a salmon population is likely to establish itself on the river.

Eel were caught at few sites and in small numbers. This is likely due to the barrier at the estuary mouth and movement U/S further hindered due to the high quantity of weirs along the length of the Water of Leith. This hypothesis is supported by the highest quantities of eel being caught in the lower catchment, therefore fewer barrier needed to be traversed. Eels were present at 8 sites in the historical surveys, and only three sites in 2022. European eel numbers, as a European stock, are still significantly reduced from their pre 1980s “healthy” population. Recruitment remains lower and for river that are heavily impacted with barrier the issues of low eel numbers will continue until mitigated.