

South Cumbria Rivers Trust Electrofishing - 2023 Report



South Cumbria Rivers Trust is registered in England and Wales as a company limited by guarantee.
Company Registration No: 5763380. It is also a registered Charity: No 1114682
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Disclaimer

Whilst this document is considered to represent the best available scientific information and expert opinion available at the stage of completion of the report, it does not necessarily represent the final or policy positions of the project funders or contractors.

Dissemination status

Unrestricted

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1. Introduction

South Cumbria Rivers Trust (SCRT) undertake annual electrofishing surveys across South Cumbria to assess juvenile salmonid (salmon and trout) populations in order to understand trends over time and monitor the impacts of delivered projects. It also gathers basic habitat information and represents an important engagement tool for people interested in their local rivers.

Salmonids are indicators of freshwater health and general catchment functioning, meaning that this monitoring provides key evidence for catchment planning, to support current projects, and to inform the development of future funding bids. This information is used by the Becks to Bay catchment partnership and other local organisations such as the Environment Agency (EA).

2. Project Aims

Aims:

- Develop a robust scientific evidence base and ongoing monitoring programme
- Investigate the effectiveness of habitat improvement work
- Assess trends in salmonid populations
- Inform the catchment plans and support Water Framework Directive monitoring
- Share data with the Becks to Bay partnership and wider public
- Identify opportunities for future habitat improvement work
- Engage public and partners with the issues facing our rivers

The project aims to undertake fish surveys on a rolling programme across the five main catchments covered by SCRT. This includes a mix of project and background sites to help to establish baseline data, monitor trends over time, and assess the effectiveness of interventions. Fish populations are naturally variable, both within rivers and through time, therefore surveys results should be viewed at a catchment scale, particularly for migratory species such as salmonids, although local variability can often be a good indicator of habitat quality.

The programme is coordinated with the EA's monitoring where possible to ensure they are complimentary and do not duplicate effort. The EA has undertaken fish surveys for several decades and hold a large database which is accessible to SCRT. However, over recent years, there has been less resource for monitoring, therefore creating a gap which SCRT aim to fill. We established and have been running an electrofishing programme since 2016. SCRT also hold some records back to 2011, although due to limited resource these surveys were on a smaller scale and completed in a different programme format.



3. Methodology

3.1 Electrofishing Methodology

Electrofishing is a humane, non-lethal technique for surveying fish populations, with a small electric current applied to the watercourse which causes temporary incapacitation and taxis of the fish towards the operator, thus rendering the fish catchable for bankside analysis. At each site an E-fish 500W electrofishing back-pack was used to survey an un-netted 50m reach using a single pass. Sites were fished following a zigzag pattern in an upstream direction, ensuring continuous coverage of the riverbed. Prior to surveying, water quality parameters, including temperature and conductivity, were measured to enable appropriate adjustment of the E-fish backpack to ensure the safety and wellbeing of both the fish and operators. The output frequency on the backpack was set to 50 Hz at all sites, as this is the most effective and safe setting for salmonids. Each survey was undertaken by a team consisting of a minimum of three people at each site, one operating the backpack and two people netting the fish using handheld nets. The method used is semi-quantitative since no stop nets are employed and there is only a single pass of the reach. Thus, making it inevitable that some fish are missed during the survey which is accounted for when calculating the results. This semi-quantitative survey method is the most resource efficient method, maximising coverage across the catchment, and can be calibrated against more detailed, resource intensive quantitative surveys (Farooqi & Aprahamian, 1993). This is also the recommended method in the United Kingdom Technical Advisory Group (UK TAG) framework for Water Framework Directive (WFD) monitoring.

Juvenile salmonids are the focus of the surveys, with data on species and length enabling an assessment of the size and age structure of their populations. Other fish species are also recorded, but not measured; these include eels, bullhead, stone loach, minnow, lampreys, and sticklebacks. Further information on the river and surrounding habitat, such as vegetation cover, bed substrate, water depth, and basic water chemistry, is recorded as well, to gain a more holistic picture of each location and inform the development of future fish habitat improvement projects.

Surveys in this report were undertaken between July and September 2023. They are restricted to this timeframe so as not to disturb fish spawning and are only permitted under licence from the EA and with permissions from local landowners. Surveys record salmonid fry and parr, which are caught and analysed on site. Fry hatch from eggs spawned in the autumn and then emerge out of gravels during April/ May. Parr are fish which are one year or older; most salmon parr leave the river in spring as smolts when they are around 12cm in length. Trout parr will either migrate down into the main river to become brown trout or undergo smoltification and move out to sea as sea trout. Typically, juvenile salmon and trout spend between 1 and 3 years in freshwater before migrating to the sea as smolts. During the surveys the number of fish and the length of each individual are recorded, measured to the fork in the tail (to the nearest 0.5cm), before all fish are returned to the water, unharmed. On rare occasions, unfortunately a very small number of mortalities can occur as fish do not withstand the process. These are recorded by SCRT and reviewed to assess both methods used and surveyor technique. To date, fish mortalities have never exceeded 0.5% of the survey catches.



Within England and Wales it is an offence to electro-fish without an appropriate licence from the Environment Agency (EA). All licences from the EA and access permission from riparian landowners and fisheries owners were gained and granted prior to surveying.

3.2 Site Selection

During 2023, SCRT were granted a permit from the EA to undertake surveys across south Cumbria. A programme was established to cover project sites, continual monitored sites and those of interest. Table 1 shows the full list of surveyed sites across south Cumbria.

Table 1: Full list of sites surveyed by SCRT across south Cumbria in 2023.

No.	Site	Catchment	Waterbody	Waterbody ID
1	Caws Beck	Crake	Crake	GB112073071190
2	Mill Beck	Crake	Crake	GB112073071190
3	Greenholme (Upper)	Crake	Crake	GB112073071190
4	Greenholme (Lower)	Crake	Crake	GB112073071190
5	Long House Gill	Duddon	Duddon	GB112074069940
6	Old Park beck	Duddon	Duddon	GB112074069940
7	Black Hall - Roudley Beck	Duddon	Duddon	GB112074069940
8	Troutal - Tarn Beck	Duddon	Tarn Beck	GB112074069920
9	Moasdale	Duddon	Duddon	GB112074069940
10	Dubbs Beck	Kent	Gowan	GB112073071410
11	Hall Beck - Over Elf Howe Farm	Kent	Kent - headwaters to conf Gowan	GB112073071390
12	Ratherheath beck - Bowston hall farm	Kent	Kent	GB112073071380
13	River Gowan - Borrans	Kent	Gowan	GB112073071410
14	Miller Beck (Main)	Leven	Leven	GB112073071420
15	Cunsey Beck	Leven	Cunsey Beck	GB112073071400
16	Miller Beck (Trib)	Leven	Leven	GB112073071420
17	Wilfin Beck	Leven	Cunsey Beck	GB112073071400
18	Horrace Hill	Minor catchment	Poaka Beck	GB112074069790
19	Pennington Beck	Minor catchment	Poaka Beck	GB112074069790
20	Poaka Beck (Goose Green)	Minor catchment	Poaka Beck	GB112074069790
21	Rathmoss Divide	Minor catchment	Poaka Beck	GB112074069790

3.3 Calculating the classification

Fish surveys provide data on the number of fish present within a reach, which can then be converted to a density of salmonids per 100 m², so the site to be graded based on the National Fisheries Classification Scheme (NFCS). This scheme has been used by the EA to classify fish populations since 1997. Following discussions with the EA the results obtained here have been calibrated and classified using the same method. This involves using a pre-calculated conversion factor to make the fish densities obtained from semi-quantitative surveys comparable to those generated from quantitative surveys (Farooqi & Aprhamian, 1993). These values can then be assigned to one of 6 classes; 5 classes based on quintiles and 1 one for absent (Table 2); these are absolute classifications meaning they are not related to sites with a similar habitat but rather are related to all sites and therefore they only give a broad indication. Prior to calibration against quantitative surveys, semi-quantitative surveys will give a minimum density of fish present at each site. Converting these values to the national system allows for comparison of abundance over a wider geographical area.

Salmonid fry and parr classes were separated based on fish sizes deduced from length abundance graphs. Fish grow at different rates depending on the site conditions, it is therefore difficult to assign one value for all sites. At sites where only a small density of fish are caught, it can be difficult to determine the break in age categories. Therefore, a best estimate based on data and comparison to nearby sites is made.

During surveys, the number of individuals of any other fish species caught are also recorded. These species are not routinely surveyed by the EA and do not form part of the classification scheme, therefore only broad assumptions on presence/absence can be deduced. Furthermore, the E-fish backpack is set to be most effective for salmonids and therefore numbers of other species caught may not be entirely representative.

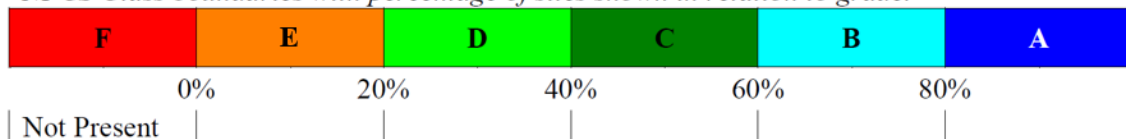
Table 2: Classification boundaries as provided by the Environment Agency (EA)**Salmonid abundance**(Values are No. per 100m⁻²)

Species group	CLASS					F
	A → ← B → ← C → ← D → ← E					
LEVEL ONE						
0+ Brown/sea trout	38	17	8	3		0
>0+ Brown trout	21	12	5	2		0
0+ Brown trout	86	45	23	9		0
>0+ Salmon	19	10	5	3		0
>0+ Rainbow trout	2	0.5	0.2	0.1		0
LEVEL TWO						
Brown/sea trout parr equivalents	47	28	15	6		0
Salmon parr equivalents	36	23	13	5		0
Total >0+ salmonids	31	18	11	4		0
>0+ Rainbow trout	2	0.5	0.2	0.1		0
LEVEL THREE						
Total salmonid parr equivalents	62	43	31	18		0

Table 3: National Fisheries Classification Scheme (NFCS) classes

Grade	Fish Density
A	Excellent
B	Good
C	Fair
D	Poor
E	Very Poor
F	No Fish Present

NFCS Class boundaries with percentage of sites shown in relation to grade.



4. Results

4.1 Overview

The following maps (Figure 1 to Figure 4) show the National Fisheries Classification Scheme (NFCS) classes for the sites surveyed across south Cumbria for salmon (fry and parr) and trout (fry and parr); full results are available in Appendix I.

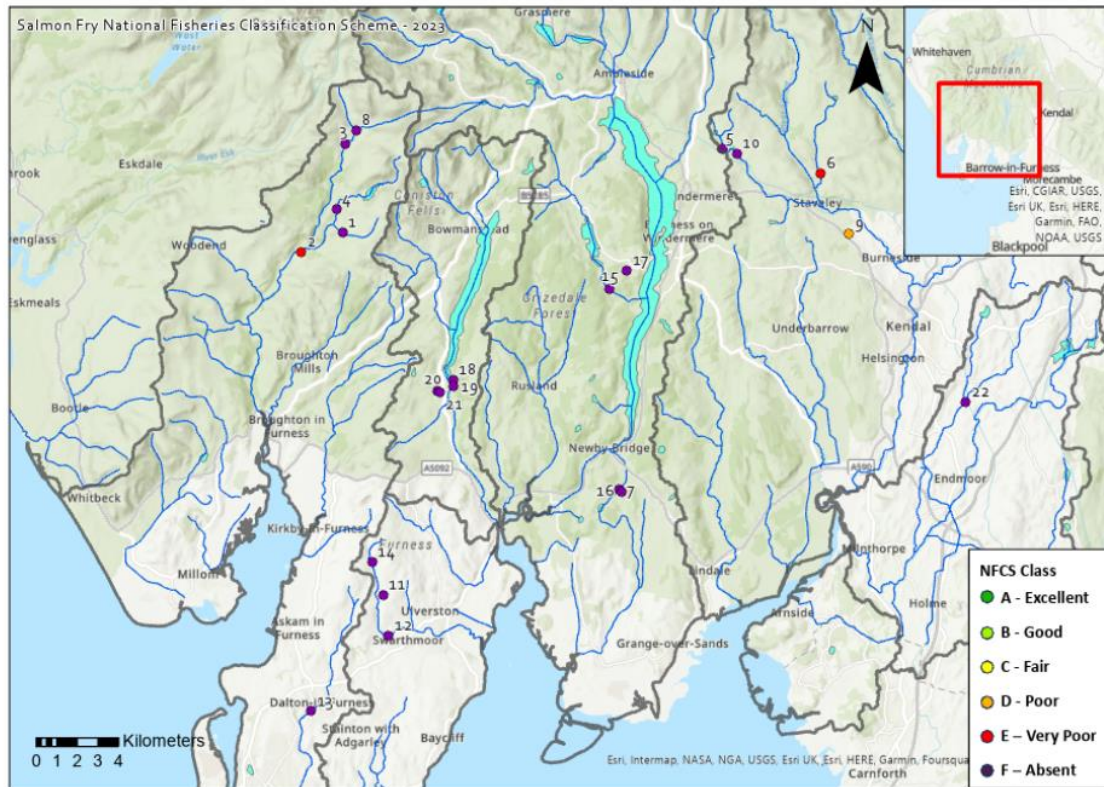


Figure 1. Salmon fry abundance as classified under the National Fisheries Classification Scheme (NFCS) at sites surveyed across south Cumbria in 2023.

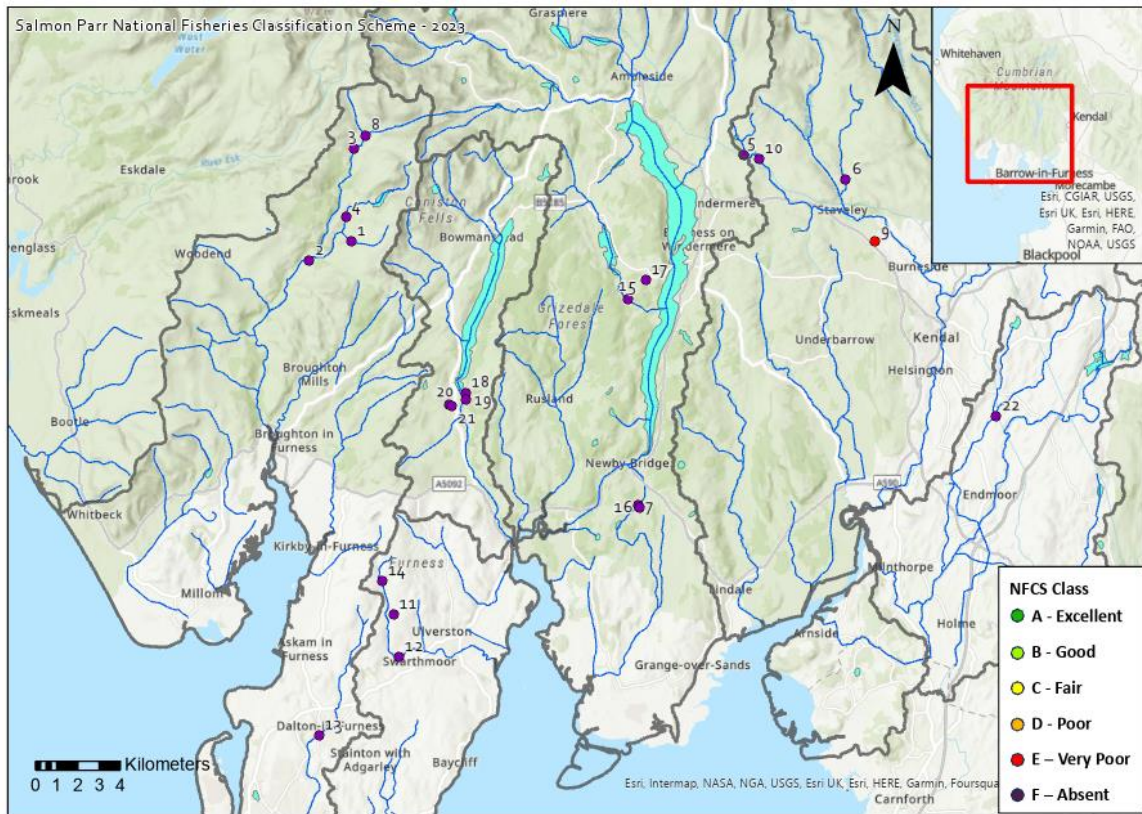


Figure 2. Salmon parr abundance as classified under the National Fisheries Classification Scheme (NFCS) at site surveyed across south Cumbria in 2023.



Figure 3. Trout fry abundance as classified under the National Fisheries Classification Scheme (NFCS) for sites surveyed across South Cumbria in 2023.

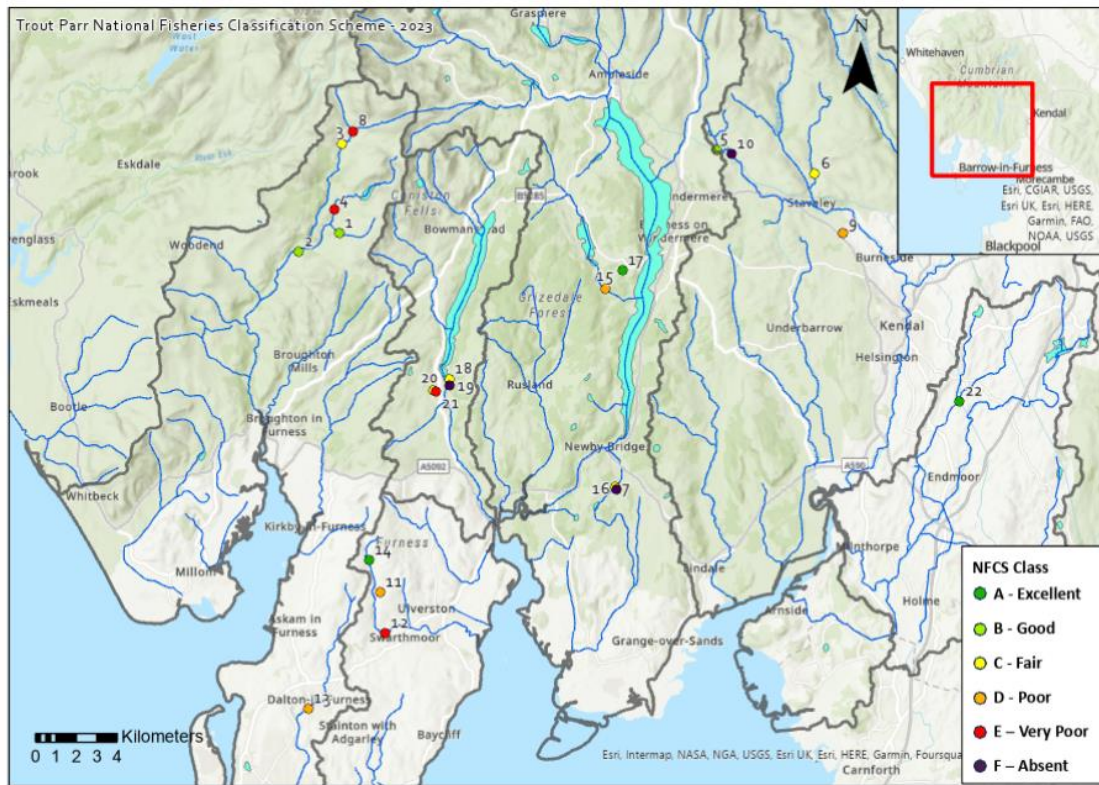


Figure 4. Trout parr abundance as classified under the National Fisheries Classification Scheme (NFCS) for sites surveyed across south Cumbria in 2023.

4.2 Duddon

A total of 5 sites have been surveyed in the Upper Duddon. Sites were selected by their locality to SCRT projects, and sites where surveys had been completed in previous years to allow for comparison. All the sites surveyed in 2022 are within the area of a United Utilities funded project, allowing SCRT to be active in the catchment and improving aspects of water quality.



Figure 5: A photograph of a salmon fry (top) and trout fry (bottom) identified at Old Park beck.



Figure 6: Volunteers measuring fish at Moasdale.

Two of the survey sites, Roudley Beck and Long House Gill were repeats of surveys carried out in 2022. Roudley Beck had been selected, as fencing was installed by SCRT creating a buffer strip, and protecting the banks from livestock poaching, in 2022. In both 2022 and 2023, salmon were absent. Both trout fry and parr populations had improved, from Fair to Good and Absent to poor respectively. This improvement may have been influenced by the reduced livestock access and poaching in the beck. Tree planting in the buffer strips is also hoped to increase shaded areas, allowing for refuges for fish in the future.

Populations at Long House Gill had improved trout parr populations, from poor to good, whilst fry populations have remained at good. Salmon were absent.

The remaining three sites surveyed were on Tarn Beck, Old Park Beck and Moasdale. Tarn Beck (9) and Moasdale (8) had the lowest number of fish caught, however this is likely to have been impacted by high flow levels as both surveys were completed after heavy rain. Again, no salmon were found. Trout fry and parr levels were Fair and Very Poor at both sites.

Old Park Beck was the only site where salmon fry were found, however this was still categorised as Very Poor. No Salmon Parr were found. Trout fry were recorded as Excellent, and parr as Good. Eels were also found at three of the sites, Old Park Beck, Roudley Beck and Tarn Beck.

Table 4: Comparison of NFCS classes between 2023 and past data for the Duddon.

Site	Salmon Fry		Trout Fry		Trout Parr	
	2022	2023	2022	2023	2022	2023
Long House Gill	Absent	Absent	Good	Good	Poor	Good
Old Park Beck	Not Surveyed	Very Poor	Not Surveyed	Excellent	Not Surveyed	Good
Roudley Beck	Absent	Absent	Fair	Good	Absent	Poor
Tarn Beck	Not Surveyed	Absent	Not Surveyed	Fair	Not Surveyed	Very Poor
Moasdale	Not Surveyed	Absent	Not Surveyed	Fair	Not Surveyed	Very Poor

4.3 Coniston & Crake

Four sites were surveyed in the Coniston and Crake catchment. Mill beck was selected following deculverting works in August 2022. Prior to the works an electrofishing survey had been completed, and no fish were found. Following the works reports of trout had been received, however no salmon or trout were caught in the 2023 survey. Minnow and bullhead were found. Salmonid numbers may have been impacted by low water levels during the survey. The survey will be repeated in 2-3 years to see if any further improvement can be identified.



Figure 7: A photograph of the fish caught during the Caws Beck survey.

Caws Beck was also monitored due to its locality to Mill Beck. No salmon were identified. Both trout fry and parr were found, and both were categorised as Fair. Although higher than at Mill Beck, low water levels may also have impacted the survey. Six eels and four bullhead were also identified in Caws Beck. Greenholme Beck was surveyed at an Upper and Lower site. These sites have been consistently monitored since 2019, over which time populations of salmon and trout recorded have fluctuated. Salmon had been identified in the 2019 and 2022 surveys, however no salmon were identified at either site in 2023. Trout fry populations were also categorised in lower or equal bracket in 2023 than all other survey years, at Fair (Lower) and Poor (Upper). Trout parr remained consistent between

2022 and 2023 at the Lower site and were categorised at Fair. There was an improvement in parr at the Upper site compared to 2022 (Absent), which were categorised as Very Poor in 2023.

Table 5: Comparison of NFCS classes for Salmon between 2023 and past data for Coniston and Crake.

Site	Salmon Fry			Salmon Parr		
	2019	2022	2023	2019	2022	2023
Caws Beck	Not Surveyed	Not Surveyed	Absent	Not Surveyed	Not Surveyed	Absent
Mill Beck	Not Surveyed	Absent	Absent	Not Surveyed	Absent	Absent
Greenholme (Upper)	Very Poor	Very Poor	Absent	Absent	Very Poor	Absent
Greenholme (Lower)	Fair	Fair	Absent	Very Poor	Fair	Absent

Table 6: Comparison of NFCS classes for Trout between 2023 and past data for Coniston and Crake.

Site	Trout Fry			Trout Parr		
	2019	2022	2023	2019	2022	2023
Caws Beck	Not Surveyed	Not Surveyed	Fair	Not Surveyed	Not Surveyed	Fair
Mill Beck	Not Surveyed	Absent	Absent	Not Surveyed	Absent	Absent
Greenholme (Lower)	Excellent	Good	Fair	Good	Fair	Fair
Greenholme (Upper)	Excellent	Excellent	Poor	Fair	Absent	Very Poor

4.4 Windermere & Leven

The Leven catchment was surveyed at four sites. Cunsey Beck was surveyed in 2022 and repeated in the same stretch in 2023. In 2022, salmon and trout were both Absent. Salmon were again absent in 2023. Both trout parr and fry saw improvement and were categorised as Poor. White-clawed Crayfish and the European Eel were also found during the 2023 survey.

A survey was also carried out at the neighbouring Wilfin Beck. Salmon were again Absent. Here trout fry populations were categorised as Good and trout parr as Excellent. Eels were also found.

Two sites were surveyed on Miller Beck, one on the main beck and one on tributary above a culvert, which was opened up by SCRT shortly after the surveys were completed. Crayfish surveys were also completed on both Miller Beck sites. No fish or crayfish were identified on the tributary. Salmon were also absent on the main beck. Crayfish were present in high numbers in the main Miller beck.

Trout fry were identified as Excellent and trout parr as Fair. The culvert is expected to be a main cause of the vast difference in trout and crayfish populations between the two sites. The survey will be repeated next year to identify if population may be moving into the tributary now the culvert has been removed. Both surveys on Miller Beck were funded as part of a Farming in Protected Landscapes (FiPL) Project.



Figure 8: A photograph of trout caught as part of the Wilfin Beck survey.

Table 7: Comparison of NFCS classes for trout between 2023 and past data for Windermere and Leven

Site	Trout Fry		Trout Parr	
	2022	2023	2022	2023
Miller Beck (Main)	Not Surveyed	Excellent	Not Surveyed	Fair
Miller Beck (Tributary)	Not Surveyed	Absent	Not Surveyed	Absent
Wilfin Beck	Not Surveyed	Good	Not Surveyed	Excellent
Cunsey Beck	Absent	Poor	Absent	Poor

4.5 Kent

A total of four sites was surveyed across the Kent catchment, as part of the LIFE R4Ever Kent project. A limited number of sites were surveyed in 2023 due to high river levels leading to the cancellation of surveys. The high-water levels may also reflect in the number of identified with juveniles taking refuge.

Dubbs Beck has been surveyed since 2016 as river restoration work has been completed previously, therefore monitoring continues to assess the effectiveness of the work. Overall, trout numbers have stayed the same, with some improvement of trout parr between 2022 and 2023.

The River Gowan which is fed by Borrans reservoir was not surveyed in 2022, however it shows Good levels of trout and salmon fry but Absent trout and salmon parr. Hall beck which is a tributary of the main River Kent was also surveyed this year prior to river restoration works, which had both Poor trout and salmon fry and absent salmon parr, but Excellent trout parr numbers. This stretch of watercourse will be surveyed in coming years to see effect of the works on the watercourse. Ratherheath Beck again had Poor numbers of trout fry and trout parr along with poor salmon fry and Very Poor salmon parr numbers.



Figure 9: Volunteers looking at the fish post survey at Hall beck

No eels were recorded at any of the sites in the Kent catchment, but bullhead and minnows were frequently caught. White clawed-Crayfish were observed in abundance in becks of varying sizes.

Table 8: Comparison of NFCS classes for Dubbs Beck between 2023 and past data.

Site	Dubbs Beck					
	2016	2017	2019	2021	2022	2023
Trout Fry	Excellent	Excellent	Excellent	Excellent	Excellent	Good
Trout Parr	Good	Fair	Poor	Fair	Fair	Good

Table 9: Comparison of NFCS classes for trout between 2023 and past data for the Kent.

Site	Trout Fry	Trout Parr
	2023	2023
River Gowan	Good	Absent
Hall beck	Very poor	Excellent
Ratherheath beck	Poor	Poor

Table 10: Comparison of NFCS classes for salmon between 2023 and past data for the Kent.

Site	Salmon Fry	Salmon Parr
	2023	2023
River Gowan	Absent	Absent
Hall beck	Poor	Very poor
Ratherheath beck	Poor	Very poor

4.6 Bela

As in 2022, one site was monitored in the Bela catchment during 2023, at Strickley on Saint Sunday's Beck, so that the impacts of restoration work carried out by the landowner in 2021 can continue to be assessed with regards to fish. Although a relatively short section of channel was surveyed, the site had significant vegetation and shading as well as taking into account the impacts of a small tributary, to give a representative indication of the fish present. Salmon fry and parr were both Absent as seen in 2022, however, changes were seen in the presence of trout. The number of trout fry equivalent per 100m² decreased from 42 to 29, representing a shift from Excellent to Good classification. The opposite trend was seen in the numbers of trout parr, which increased from 10 per 100m² to 23 per 100m² equivalent, representing a positive shift in classification from Fair to Excellent (Table X).

Table 11: Comparison of NFCS classes for Trout between 2023 and past data for the Bela.

Site	Trout Fry		Trout Parr	
	2022	2023	2022	2023
St. Sunday's Beck	Excellent	Good	Fair	Excellent

4.7 Minor Catchments

Minor catchments are those which do not sit directly within one of our five main catchments. This includes the Poaka catchment, which is part of the United Utilities Raw Water funded project area. All surveys in this area where funded as part of the Raw Water project, which aims to improve water quality in the Duddon and Poaka catchments.

Four sites were surveyed in the Poaka catchment. Two in the direct work area of the Raw Water project, Horracc Hill and the Rathmoss Beck. Both locations were identified prior to possible 2024 delivery works. Salmon were Absent at both sites. Trout fry were also absent at Horracc Hill despite being identified as Excellent in 2022. Trout parr numbers had also declined and were recorded as Poor in 2023. Minnow, however, were identified in 2023 but not in 2022. This site will be surveyed again next year to see if this is consistent or subject to conditions on the day of the survey. The site on the Rathmoss Beck had not been previously surveyed by SCRT. Here trout fry were found to be Good and trout parr as Excellent.

The remaining two sites were selected both as part of the Raw Water project and the AMbOM Eel Migration Easement Project. Both sites were either directly above or below a migration barrier. Again, no salmon were identified at either site. Trout fry were identified but were recorded as Very Poor at both sites. Trout fry



Figure 10: Volunteers measuring fish on Rathmoss Beck.



Figure 11: Volunteers measuring fish on Pennington Beck.

were identified as very poor at the Pennigton Beck site and Poor at the Poaka Beck Site. Eels were identified at the Pennington Beck site but not at Poaka beck. These population numbers may be impacted by the migration barrier but both surveys will be repeated to greater represent populations at both sites.

Table 12: Comparison of NFCS classes for trout between 2023 and past data for the Minor catchments

Site	Trout Fry		Trout Parr	
	2022	2023	2022	2023
Horrace Hill	Excellent	Absent	Good	Poor
Pennington Beck	Not Surveyed	Very Poor	Not Surveyed	Very Poor
Poaka Beck (Goose Green)	Not Surveyed	Very Poor	Not Surveyed	Poor
Rathmoss Beck	Not Surveyed	Good	Not Surveyed	Excellent

4.8 Environment Agency Classifications

SCRT work closely with the EA to share data and evidence, this partnership working helps to provide a more holistic picture of fish populations across south Cumbria. During 2022, the electrofishing programme has been part funded by the EA, as part of a collaborative project focusing on Priority Salmon Rivers and better sharing of data.

Additionally, the sites surveyed in south Cumbria by the EA can be seen in Figure 12 below; the Crake and Bela were relatively well covered by the EA teams during 2022. The raw data from the EA is now available via the Ecology and Fish Data Explorer, link below, however this is not yet available as National Fisheries Classifications.

EA Ecology and Fish Data Explorer. <https://environment.data.gov.uk/ecology/explorer/>

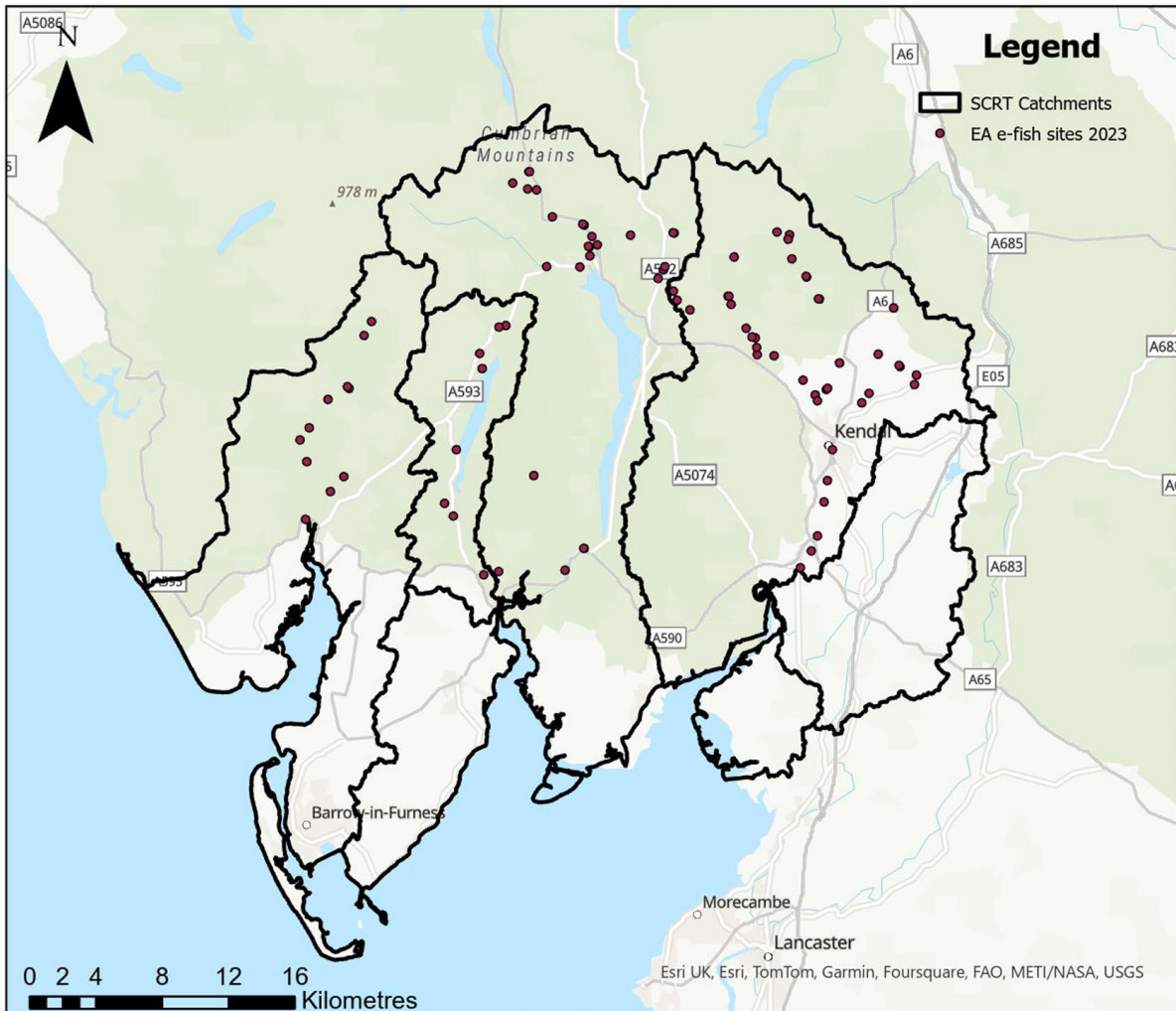


Figure 12. Environment Agency (EA) electrofishing sites 2023.

4.9 Sources of Error

Although every effort is made to reduce sources in error it is inevitable that some occur. Firstly, as a small organisation, SCRT are not able to use the same team of people for each electrofishing survey and are reliant on the support of volunteers. There is naturally variation between different people in terms of experience and technique. Furthermore, there can also be changes over time as surveyors become more experienced.

The same backpack and the same set up method are used at every site to help reduce variation in results. However, the conductivity of the water varies naturally. Although the backpack can be adjusted to take this into account, there are several sites across south Cumbria where the conductivity of the water is low, reducing the catch efficiency. Most sites surveyed in 2023 had relatively good conductivity, although some reaches in the upper Duddon experience low conductivity. Similarly, habitat and flow variation can also impact catch efficiency. Overhanging branches and tree roots are good habitat for fish but can also hinder the netting, potentially skewing the data. To minimize this, SCRT use a number of different nets appropriate to the stream type, for example a small hand net is more appropriate in a small stream with variable bed substrate.

5. Historic Data

South Cumbria Rivers Trust have been undertaking a full electrofishing programme over the 5 main catchments covered by the trust since 2016. Prior to 2016 a number of surveys were done but these were limited in capacity and extent. A timeseries from 2016 to 2021 can be viewed on the SCRT map, this shows all the locations where SCRT have surveyed since 2011, and enables a comparison of trends between years, particularly where sites have been revisited.

You can view a copy of the maps by [clicking here](#).

6. The National Picture

The Centre for Environment, Fisheries and Aquaculture Science (CEFAS) produce an annual report on the salmon stocks in England and Wales, these have been produced since 1997. This helps to set our data into wider context; however, the report is for the year before, 2022; 2023 data won't be available until next year.

The report noted that overall, there has been a decline in the numbers of salmon returning to most rivers over the last 20 years. The Northwest have had a marked decline in the numbers of returns to rivers over the last decade, in comparison in southern England, there is evidence of stocks stabilising and showing slight signs of recovery. There are 49 rivers in England which regularly support salmon and are therefore designated as 'principal salmon rivers', 4 of these rivers are within south Cumbria; the River Kent, River Leven, River Crake and River Duddon which have been a focus for this year's electrofishing surveys by SCRT.

During electrofishing surveys the EA found that 58% of sites surveyed between 2016 and 2021 were in the lowest two classes of the National Fisheries Classification Scheme (Class E -Very Poor or F - Absent). In 2021, 35% of sites were classed as A (Excellent) to C (Fair) which is just below the time series average between 2005 – 2021, see Figure 13 for the distribution.

For further information the 2022 report can be found here: [2022 Report](#)



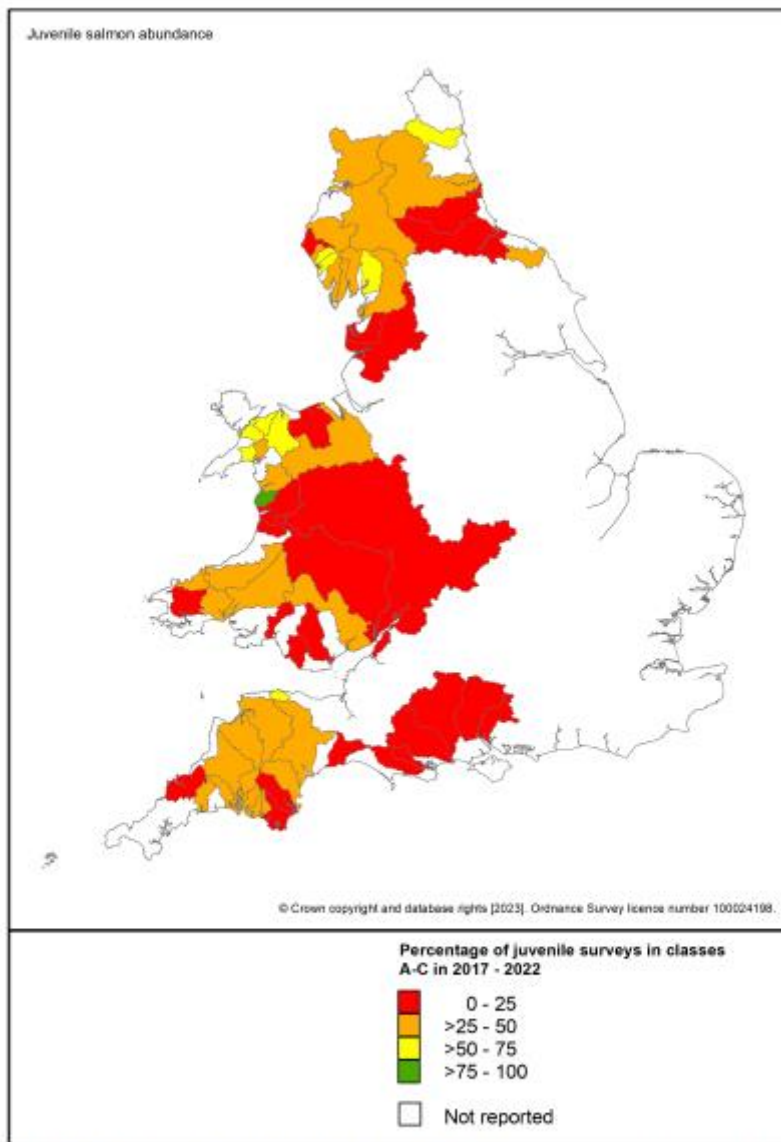


Figure 26. Juvenile salmon abundance indices for each catchment, presented as the percentage of electrofishing survey sites in classes A to C only, 2017-2022. N.B. no 2020 data shown on the figure because COVID-19 access and movement restrictions prevented any notable juvenile salmonid monitoring.

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Figure 13. Screenshot from CEFAS (2022) salmon stocks report, showing the percentage of electrofishing surveys classed as Excellent to Fair in 2017 – 2022.

7. Other Species

During surveys all fish seen were caught; in addition to the salmonids, this also included bullhead (*Cottus gobio*), European eels (*Anguilla anguilla*), stone loach (*Barbutula barbutula*). Although these species were recorded, surveys were not targeted at these species and the e-fish kit was not set to be most effective for non-salmonids. Therefore, the following data should be taken with some caution. Additionally, the EA do not hold density data for non-salmonids therefore, there is no calculation to account for semi-quantitative surveys or a national fisheries classification scheme for comparison between rivers. Figure 14 shows the abundance and diversity of fish species within the sites sampled; these have been adjusted for density. Smithy beck had the highest density of fish, although was mainly dominated by trout fry. Comparatively, several becks recorded no species of fish, which can be indicator wider issues with the health of the system.

7.1 European eel

European eel, *Anguilla anguilla*, were recorded at 40% of the sites surveyed, an increase on 32% sites in 2022. Eels have seen huge declines since the 1980/90s and are classed as 'critically endangered', therefore their presence in the surveys is a good sign. Eels were recorded in all of the main catchments (Duddon, Crake, Leven and Bela) apart from the Kent, this reflects findings from 2021 and 2022. Eels were also identified in the Poaka catchment, one of SCRT minor catchments. All eels caught however were of adult size. In 2023-2024 SCRT are undertaking an eel migration easement project around the Poaka catchment to increase potential habitat in Poaka and Pennington Becks for smaller eels who cannot pass existing barriers.

7.2 Bullhead

Bullhead, *Cottus gobio*, are typically found in stony rivers or streams with fast flowing waters. Due to their nature to lie under rocks and dwell at the bottom of a river they can be harder to catch. They are relatively widespread across south Cumbria. Furthermore, where present they have typically been found at relatively good numbers; sites such as Lambrigg on the Kent, Scandale beck in the Leven catchment and Langholme in the Crake catchment all support relatively good densities of bullhead. They are relatively widespread across south Cumbria.

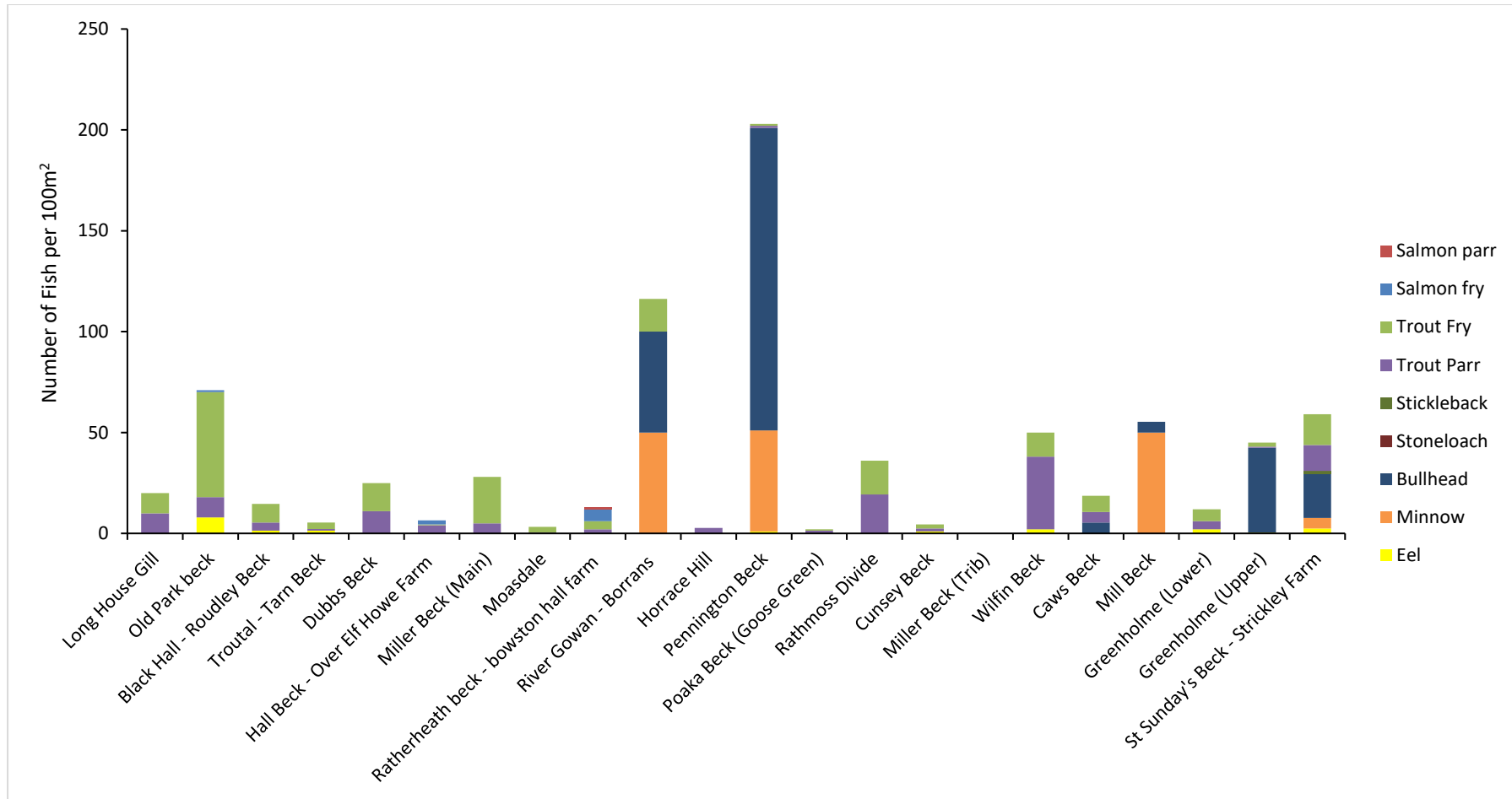


Figure 14. Abundance of all fish species recorded during 2023 surveys. Note this has been adjusted for density however, it has not been adjusted to take into account the fact that surveys were semi-quantitative.

8. Next Steps for 2024

There will be a continued focus on expanding the programme, working with the national Rivers Trust and EA on priority salmon rivers. Additionally, SCRT project work will continue to support surveys in the Kent, Duddon and Poaka catchments. Further surveys in the Leven catchment will link with the development of the Windermere Community Partnership and the work of Love Windermere. Furthermore, the review of volunteer programmes across south Cumbria as part of the Windermere Community Partnership development will help to support the programme, which would not be possible without volunteers.

9. Acknowledgements

SCRT would like to thank all the volunteers who helped us survey, we could not undertake the programme without their support. Similarly, thanks must also go to the landowners for granting us permission to survey on their land. Funding to undertake the surveys this year came from the United Utilities via the Raw Water project, the European Union via the LIFE R4Ever Kent project, the Lake District National Park FiPL funding and from the Department for Environment, Food and Rural Affairs (DEFRA) via the catchment-based approach. We are grateful for all contributions which support our on-going monitoring work.

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Appendix I

Raw data and National Fisheries Classification class by site for 2023.

No.	Site Name	Catchment	No. Salmon Fry	Total No./ 100m2	Salmon Fry NFCS Classification	No. Salmon Parr	Total No. per 100m2	S.Parr NCFS Classification	No. Trout Fry	Total No. per 100m2	T.Fry NCFS Classification	No. Trout Parr	Total No. per 100m2	T.Parr NCFS Classification
1	Long House Gill	Duddon	0	0.00	F	0	0.00	F	15	19.42	B	15	18.55	B
2	Old Park beck	Duddon	1	2.16	E	0	0.00	F	52	100.97	A	10	18.55	B
3	Black Hall - Roudley Beck	Duddon	0	0.00	F	0	0.00	F	7	18.12	B	3	7.42	C
4	Troutal - Tarn Beck	Duddon	0	0.00	F	0	0.00	F	7	6.04	D	2	1.65	E
5	Dubbs Beck	Kent	0	0.00	F	0	0.00	F	14	27.18	B	11	20.41	B
6	Hall Beck - Over Elf Howe Farm	Kent	4	4.32	E	0	0.00	F	1	0.97	E	8	7.42	C
7	Miller Beck (Main)	Leven	0	0.00	F	0	0.00	F	23	44.66	A	5	9.28	C
8	Moasdale	Duddon	0	0.00	F	0	0.00	F	7	5.44	D	1	0.74	E
9	Ratherheath beck - bowston hall farm	Kent	6	12.96	D	1	2.36	E	4	7.77	D	2	3.71	D
10	River Gowan - Borrans	Kent	0	0.00	F	0	0	F	26	31.55	B	0	0.00	F
11	Horrace Hill	Minor	0	0.00	F	0	0	F	0	0.00	F	2	4.95	D
12	Pennington Beck	Minor	0	0.00	F	0	0	F	2	1.94	E	2	1.86	E
13	Poaka Beck (Goose Green)	Minor	0	0.00	F	0	0	F	1	1.29	E	2	2.47	D
14	Rathmoss Divide	Minor	0	0.00	F	0	0	F	25	32.36	B	29	35.87	A
15	Cunsey Beck	Leven	0	0.00	F	0	0	F	4	3.88	D	3	2.78	D
16	Miller Beck (Trib)	Leven	0	0.00	F	0	0	F	0	0.00	F	0	0.00	F
17	Wilfin Beck	Leven	0	0.00	F	0	0	F	6	23.30	B	18	66.79	A
18	Caws Beck	Crake	0	0.00	F	0	0	F	6	15.53	C	4	9.89	C
19	Mill Beck	Crake	0	0.00	F	0	0	F	0	0.00	F	0	0.00	F
20	Greenholme (Lower)	Crake	0	0.00	F	0	0	F	3	11.65	C	2	7.42	C
21	Greenholme (Upper)	Crake	0	0.00	F	0	0	F	4	3.88	D	1	0.93	E
22	St Sunday's Beck - Strickley Farm	Bela	0	0.00	F	0	0.00	F	32	29.59	B	27	23.85	A

Appendix II

Densities per 100m² of all fish species caught. Note these are from semi-quantitative survey and have not been converted to quantitative. Minor species are recorded in categories (0 to 9, 10 to 99, 100 to 999 etc.)

Site Name	Eel	Lamprey	Minnow	Bullhead	Stoneloach	Stickleback
Long House Gill	0	0	0	0	0	0
Old Park beck	8	0	0	0	0	0
Black Hall - Roudley Beck	1	0	0	0	0	0
Troutal - Tarn Beck	1	0	0	0	0	0
Dubbs Beck	0	0	0	0	0	0
Hall Beck - Over Elf Howe Farm	0	0	0	0	0	0
Miller Beck (Main)	0	0	0	0	0	0
Moasdale	0	0	0	0	0	0
Ratherheath beck - bowston hall farm	0	0	0	0	0	0
River Gowan - Borrans	0	0	10 to 99	10 to 99	0	0
Horrace Hill	0	0	0	0	0	0
Pennington Beck	1	0	10 to 99	100 to 999	0	0
Poaka Beck (Goose Green)	0	0	0	0	0	0
Rathmoss Divide	0	0	0	0	0	0
Cunsey Beck	1	0	0	0	0	0
Miller Beck (Trib)	0	0	0	0	0	0
Wilfin Beck	2	0	0	0	0	0
Caws Beck	0	0	0	5	0	0
Mill Beck	0	0	10 to 99	5	0	0
Greenholme (Lower)	2	0	0	0	0	0
Greenholme (Upper)	1	0	0	10 to 99	0	0
St Sunday's Beck - Strickley Farm	2	0	0 to 9	10 to 99	0	1



South Cumbria Rivers Trust is registered in England and Wales as a company limited by guarantee (Company No: 5763380) and a charity (Charity No: 1114682). We established in 2000 with the aim to protect, conserve and rehabilitate the aquatic environments of South Cumbria.

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