# South Cumbria Rivers Trust
# Electrofishing - 2024 Report

South Cumbria Rivers Trust

## Contractor

This document was produced by South Cumbria Rivers Trust
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## Project Funders

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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

## SCRT Project Manager

SCRT's project manager for this contract was: Hannah Teagle, Emma Wright and Oliver Winder

## Report completed and signed off

Hannah Teagle and Emma Wright

Position: Project Officers Date: 03/02/2024

## SCRT Project Code

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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 2024, 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 2024.**

| Site | Catchment | Waterbody | Waterbody ID |
|---|---|---|---|
| Greenholme Beck - Lower | Crake | Crake | GB112073071190 |
| Greenholme Beck - Upper | Crake | Crake | GB112073071190 |
| Appletreeworth Beck | Duddon | Lickle | GB112074069880 |
| Castlehow Beck | Duddon | Duddon | GB112074069940 |
| Cockley Beck | Duddon | Duddon | GB112074069940 |
| Dalehead Gill | Duddon | Duddon | GB112074069940 |
| Lickle | Duddon | Lickle | GB112074069880 |
| Logan Beck | Duddon | Duddon | GB112074069910 |
| Rake Beck | Duddon | Duddon | GB112074069940 |
| Braban House | Kent | Kent | GB112073071380 |
| Lambrigg Beck - Downstream | Kent | Flodder | GB112073071340 |
| Lambrigg Beck - Upstream | Kent | Flodder | GB112073071340 |
| Low House - River Sprint | Kent | Sprint | GB112073071430 |
| Middale - River Sprint | Kent | Sprint | GB112073071430 |
| Sadgil - Downstream of Bridge | Kent | Sprint | GB112073071430 |
| Sadgil - Revetment section | Kent | Sprint | GB112073071430 |
| Sadgil - Upstream of weir | Kent | Sprint | GB112073071430 |
| Hazelrigg Mill Beck | Leven | Leven | GB531207311900 |
| Hazelrigg Trib | Leven | Leven | GB531207311900 |
| Ellerbarrow - Pennington | Poaka | Poaka Beck | GB112074069790 |
| Pennington Beck | Poaka | Poaka Beck | GB112074069790 |
| Arndale Beck - Town End | Winster | Winster | GB112073071440 |
| Small Beck - Town End | Winster | Winster | GB112073071440 |

### *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 $m^2$, 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)

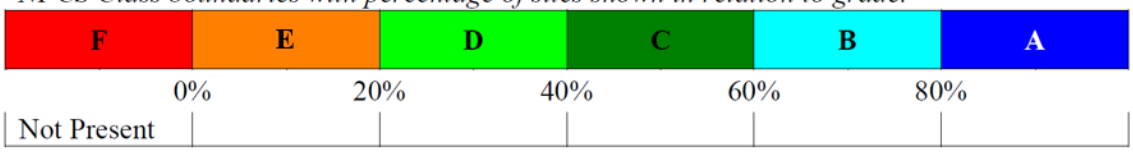
**Salmonid abundance**
**(Values are No. per 100m$^{-2}$)**

| Species group | CLASS | | | | |
|---|---|---|---|---|---|
| | A → | ← B → | ← C → | ← D → | ← E | F |
| **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 Classifications 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.

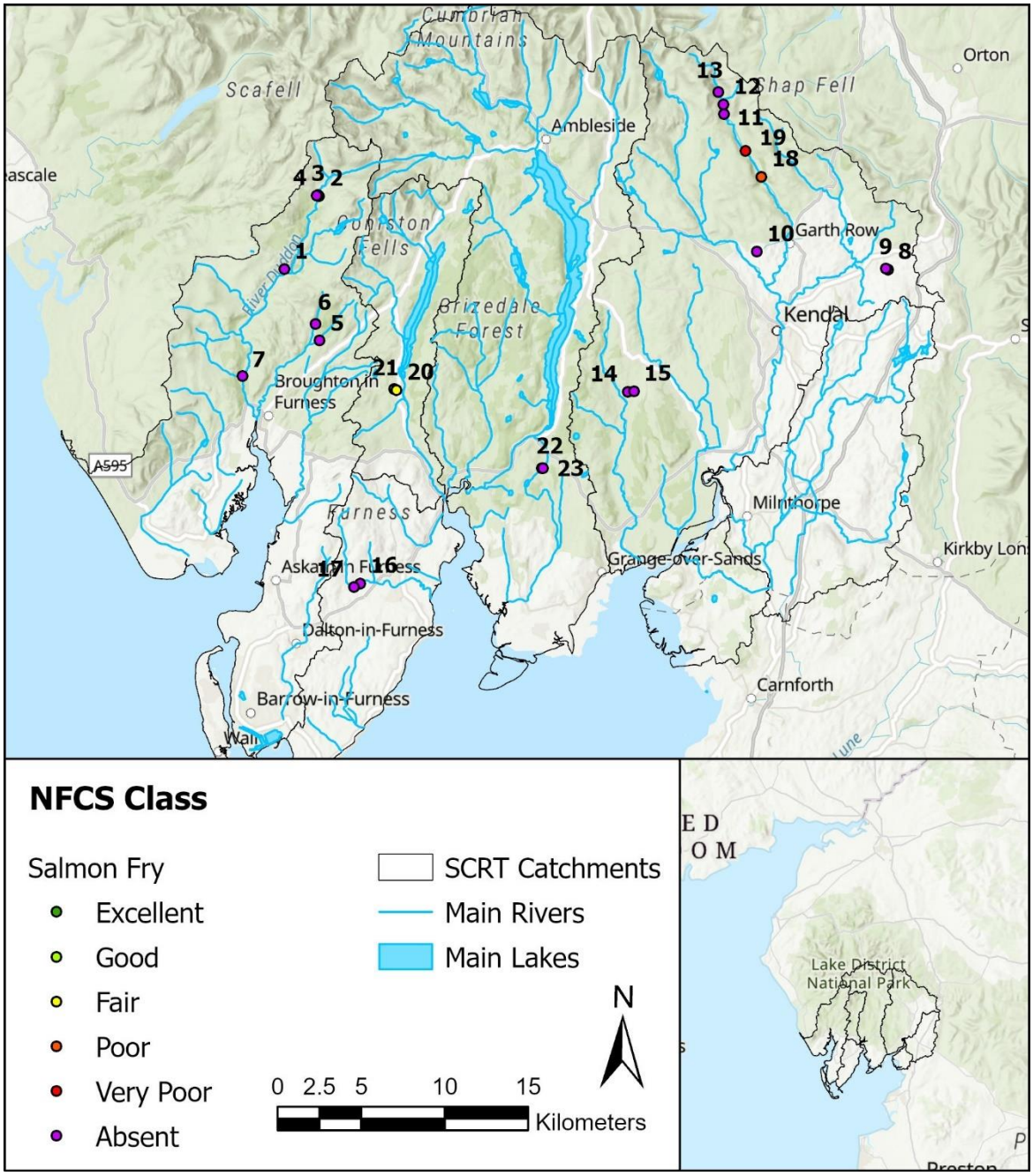



**Figure 1. Salmon fry abundance as classified under the National Fisheries Classification Scheme (NFCS) at sites surveyed across south Cumbria in 2024.**

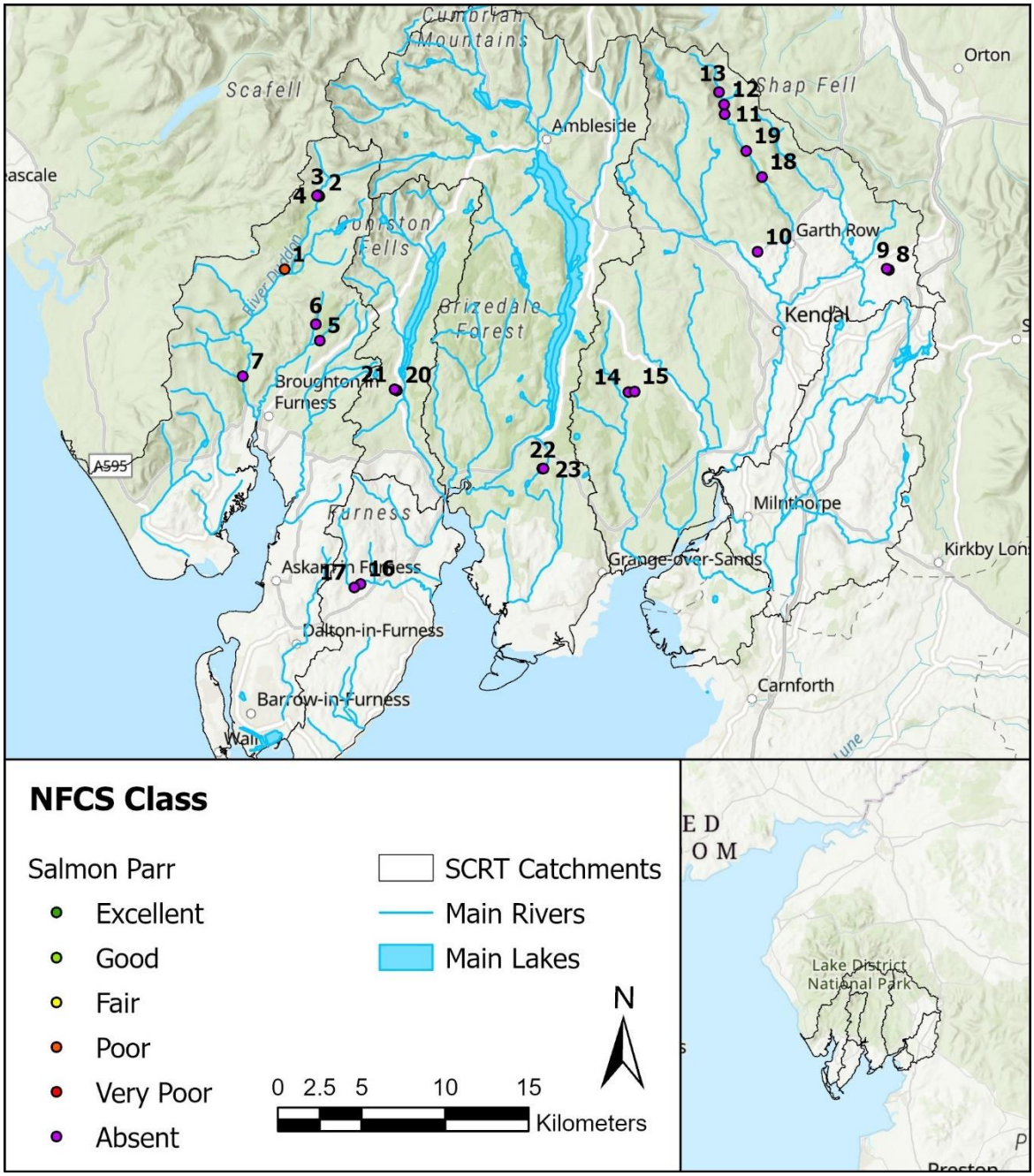



**Figure 2. Salmon parr abundance as classified under the National Fisheries Classification Scheme (NFCS) at site surveyed across south Cumbria in 2024.**

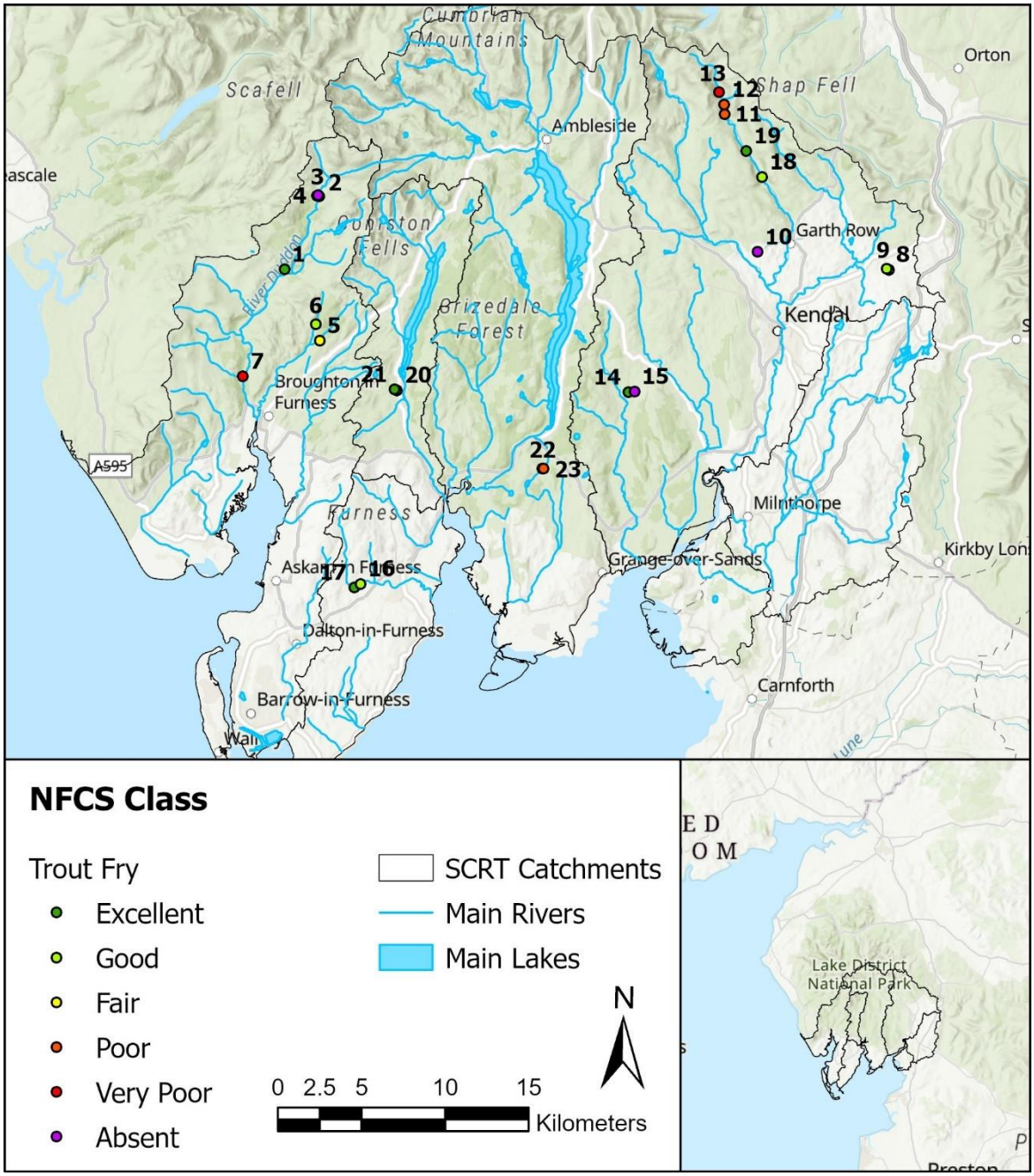



**Figure 3. Trout fry abundance as classified under the National Fisheries Classification Scheme (NFCS) for sites surveyed across South Cumbria in 2024.**

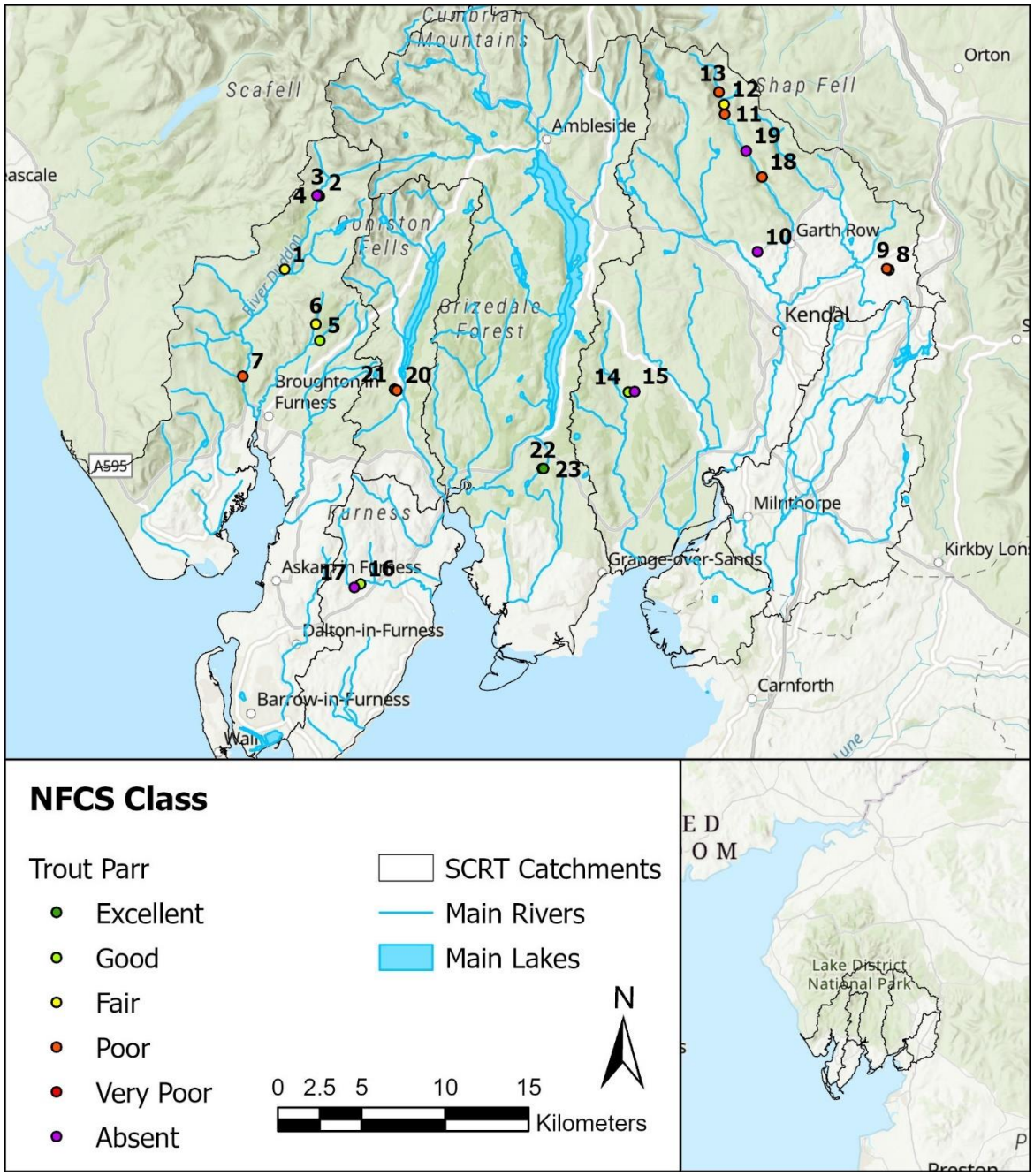



**Figure 4. Trout parr abundance as classified under the National Fisheries Classification Scheme (NFCS) for sites surveyed across south Cumbria in 2024.**

### *4.2 Duddon*

Seven sites were surveyed in the Duddon catchment, five on the main River Duddon and two on the River Lickle. Sites were selected due to locality to existing projects, or to expand the dataset of sites monitored in previous years. Sites were surveyed within three main areas; the United Utilities funded Raw water project area, the Upper Duddon Landscape Recovery area and the Lower Duddon Catchment Partnership project area.

The four surveys in the Upper Duddon catchments were repeats of 2021 and 2022 surveys, taken to obtain baseline conditions for the Landscape Recovery Project. Salmon were only found on one of the sites (categorised as Poor), Rake Beck. Populations were classified as poor, however this showed improvement on the 2021 survey where following drought conditions, salmon were reported as absent. Identified as an area for improvement, a bufferstrip was also installed on the lower reach of Castlehow beck in 2022, which has been establishing over the last two years. Whilst trout Parr were absent, which may be due to the size of the beck during the surveyed reach, Trout Fry were found to be good. No fish were found in the surveyed reach of Cockley Beck, this was a decline in comparison to a previous survey in 2022, however populations were found to be low in both instances. Similarly, populations in Dale Head Gill were identified to be consistently poor, with only Trout Fry recorded.

**Figure 5: A photograph of the electrofishing survey at Dale Head Gill, with the help of volunteers.**

Appletreeworth Beck and Croglinhurst sites were last surveyed in 2022, providing an indication of populations on the Lickle. No Salmon were identified in the 2024 surveys, despite being found in low numbers on Appletreeworth Beck in 2022. Trout fry populations were found to be consistent or slightly degreased, whilst trout parr had remained consistent or slightly increased, likely due to annual variation.

A new site, at Logan Beck, was surveyed prior to the installation of several large woody debris features. The features were installed to increase fish refuge areas on the beck. Salmon were not found, and trout populations were classified as poor and very poor. The beck however was a stronghold for the endangered European eel, with 11 caught during the survey with more identified but missed. It is hoped that the newly installed fish refuges will increase Salmon and trout populations, while maintaining the good population off eels. Eels were also found at Rake Beck and Appletreeworth beck

**Table 4: Comparison of NFCS classes for Salmon between 2024 and past data for the Duddon and Lickle.**

| | Trout Fry | | | Trout Parr | | |
|---|---|---|---|---|---|---|
| **Site** | **2021** | **2022** | **2024** | **2021** | **2022** | **2024** |
| **Rake Beck** | Absent | Not Surveyed | Excellent | Absent | Not Surveyed | Fair |
| **Dale Head Gill** | Not Surveyed | Poor | Poor | Not Surveyed | Absent | Absent |
| **Cockley Beck** | Not Surveyed | Poor | Absent | Not Surveyed | Absent | Absent |
| **Castlehow Beck** | Not Surveyed | Not Surveyed | Good | Not Surveyed | Not Surveyed | Absent |
| **Appletreeworth Beck** | Not Surveyed | Excellent | Fair | Not Surveyed | Very Poor | Good |
| **Lickle (Croglinhurst)** | Not Surveyed | Fair | Good | Not Surveyed | Good | Fair |
| **Logan Beck** | Not Surveyed | Not Surveyed | Very Poor | Not Surveyed | Not Surveyed | Poor |

### *4.3 Coniston & Crake*

Two sites were surveyed in the Coniston and Crake catchment, both on Greenholme Beck at an Upper and Lower site which are upstream and downstream of past river restoration works, respectively. These sites have been consistently monitored since 2019, over which time populations of salmon and trout recorded have fluctuated. Salmon fry were identified in their highest numbers at both sites since monitoring began in 2019 with classifications of Good (lower) and Fair (upper), however, no salmon parr were identified at either site.

**Figure 6: Volunteers e-fishing**

Trout fry populations were also categorised at their joint highest level since monitoring began, with both sites classed as Excellent. This represents an improvement on results from the previous year and a return to the numbers seen previously in 2019 and 2022. Trout parr were classified as poor at the lower site, a decrease compared to the Fair classification received in 2023. However, there was significant improvement in the numbers of Trout parr at the Upper site, from being classed as Very Poor in 2023 to Good in 2024.

**Table 5: Comparison of NFCS classes for Salmon between 2024 and past data for Coniston and Crake.**

| | Salmon Fry | | | | Salmon Parr | | | |
|---|---|---|---|---|---|---|---|---|
| **Site** | **2019** | **2022** | **2023** | **2024** | **2019** | **2022** | **2023** | **2024** |
| **Greenholme (Upper)** | Very Poor | Very Poor | Absent | Fair | Absent | Very Poor | Absent | Absent |
| **Greenholme (Lower)** | Fair | Fair | Absent | Good | Very Poor | Fair | Absent | Absent |

**Table 6: Comparison of NFCS classes for Trout between 2024 and past data for Coniston and Crake.**

| | Trout Fry | | | | Trout Parr | | | |
|---|---|---|---|---|---|---|---|---|
| **Site** | **2019** | **2022** | **2023** | **2024** | **2019** | **2022** | **2023** | **2024** |
| **Greenholme (Lower)** | Excellent | Good | Fair | Excellent | Good | Fair | Fair | Poor |
| **Greenholme (Upper)** | Excellent | Excellent | Poor | Excellent | Fair | Absent | Very Poor | Good |

*4.4*

The Leven catchment was surveyed at two reaches on the same site. Both surveys were completed to provide comparison to surveys completed in 2023. The surveys were done upstream and downstream of a culvert, which was opened after the 2023 survey, at the end of the same summer. Works to remove a small barrier to fish migration were also completed. Crayfish were identified at the downstream end and crayfish surveys were completed alongside the e-fish surveys. Salmon were not found in either 2023 or 2024. Trout populations were shown to have improved, with fish identified in the upper reach despite being absent in the previous year. With the exception of Trout Fry in the tributary (upstream reach), all Trout populations were classified as excellent.

**Figure 8: SCRT Staff with a crayfish during the crayfish survey.**

**Table 7: Comparison of NFCS classes for trout between 2024 and past data for Windermere and Leven**

| | Trout Fry | | Trout Parr | |
|---|---|---|---|---|
| **Site** | **2023** | **2024** | **2023** | **2024** |
| **Miller Beck (Main)** | Excellent | Excellent | Fair | Excellent |
| **Miller Beck (Tributary)** | Absent | Poor | Absent | Excellent |

### *4.5 Kent*

A total of eight sites was surveyed across the Kent catchment, as part of the LIFE R4Ever Kent project. Majority of these sites were surveyed as part of our ongoing programme or as baseline assessment for river works to be occurring in the future.

**Figure 9: Photo of a juvenile crayfish, only a couple of millimetres long**

Lambrigg beck was re-surveyed post the river works that was completed in 2022 and 2023. The results (Table 8) show that there has been an increase in the classification particularly in trout parr upstream of the weir. Although it has only been a year since the weir has been removed, this is a promising sign that increase fish movement upstream and downstream can occur. Further monitoring will continue to ensure numbers increase. Crayfish numbers were high at both survey locations with a range of ages from young juveniles to large adults.

**Table 8: Comparison of data pre and post weir removal at Lambrigg Beck.**

| | | Trout Fry | Trout Parr |
|---|---|---|---|
| Upstream of Weir | 2022 | Fair | Poor |
| | 2024 | Good | Good |
| Downstream of Weir | 2022 | Good | Absent |
| | 2024 | Good | Poor |

The river Sprint was surveyed in numerous locations, both trout and salmon were identified, however, salmon numbers were lower than trout. White clawed crayfish were observed at all locations apart from the upper sections of Sadgill where a natural barrier exists to migration. This barrier is expected to be the main cause of the difference between trout populations upstream and downstream in the valley.

**Figure 10: Volunteers measuring fish**

**Table 9: Comparison of NFCS classes for Trout within the River Sprint.**

| | Trout Fry | Trout Parr |
|---|---|---|
| **Site** | **2024** | **2024** |
| **Sadgill – 1** | Absent | Poor |
| **Sadgill - 2** | Poor | Fair |
| **Sadgill – 3** | Poor | Poor |
| **Well Foot** | Excellent | Absent |
| **Low House** | Good | Poor |

**Table 10: Comparison of NFCS classes for Salmon within the River Sprint.**

| | Salmon Fry | Salmon Parr |
|---|---|---|
| **Site** | **2024** | **2024** |
| **Sadgill – 1** | Absent | Absent |
| **Sadgill - 2** | Absent | Absent |
| **Sadgill – 3** | Absent | Absent |
| **Well Foot** | Very Poor | Absent |
| **Low House** | Poor | Absent |

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. White clawed crayfish were observed in high numbers throughout the survey.

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 high abundance in becks of varying sizes, from small juveniles to adults.

**Figure 11: Volunteer measuring and recording fish at Dubbs Beck**

### *4.7 Minor Catchments*

**Poaka**

Minor catchments are those which do not sit directly within one of our five main catchments. This includes the Poaka Catchment and Furness Peninsula. Two sites were surveyed in the catchment in 2024 season. Both sites were completed under the AMbOM Eel project, to ease migration for the endangered European Eel. The upstream site had also been surveyed in 2023 as a baseline, prior to easement works along Pennington Beck which are being completed in summer 2024 and 2025. Salmon were not identified in either year. Trout Fry numbers were shown to have improved from being classified as very poor in 2023 to excellent in 2024. Trout Parr however were absent in 2024. Eel numbers had also increased at the site, from 2 in 2023 to 10 in 2024. The new site, at Ellerbarrow was taken downstream of one of the largest barriers for comparison to the upstream site. Again, no Salmon were found. Trout Parr and Fry however, where found to be good.

**Figure 12: A photograph of SCRT measuring fish at Pennington Beck.**

**Table 11: Comparison of NFCS classes for trout between 2023 and past data for the Poaka catchment**

| | Trout Fry | | Trout Parr | |
|---|---|---|---|---|
| **Site** | **2023** | **2024** | **2023** | **2024** |
| **Pennington Beck** | Very Poor | Excellent | Very Poor | Absent |
| **EllerBarrow** | Not Surveyed | Good | Not Surveyed | Good |

**Winster**

Two surveys were completed on a site in the Winster Catchment. The surveys had not been done previously, providing a baseline for a FiPL project to improve habitat and water quality on a private landholding. No Salmon were found on either site. The two sites, one a modified ditch, and one a section of Arndale displayed contrasting populations of Trout despite close proximity. In the modified reach, Trout were absent, however Stickleback were identified. The second site excellent populations of Fry and good populations of Parr, despite heavy sedimentation in the watercourse. It is hoped that the works under the FiPL funded project will help to increase populations in both becks.

**Table 12: Comparison of NFCS classes for trout between 2023 and past data for the Winster catchment**

| | Trout Fry | Trout Parr |
|---|---|---|
| **Site** | **2024** | **2024** |
| **Arndale Beck - Town End** | Excellent | Good |
| **Small Beck - Town End** | Absent | Absent |

### *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.

Additionally, the sites surveyed in south Cumbria by the EA can be seen in Figure 13 below; the Duddon, Kent, Crake, Rothay were well covered by the EA teams during 2023. The raw data from the EA is now (freely) 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/

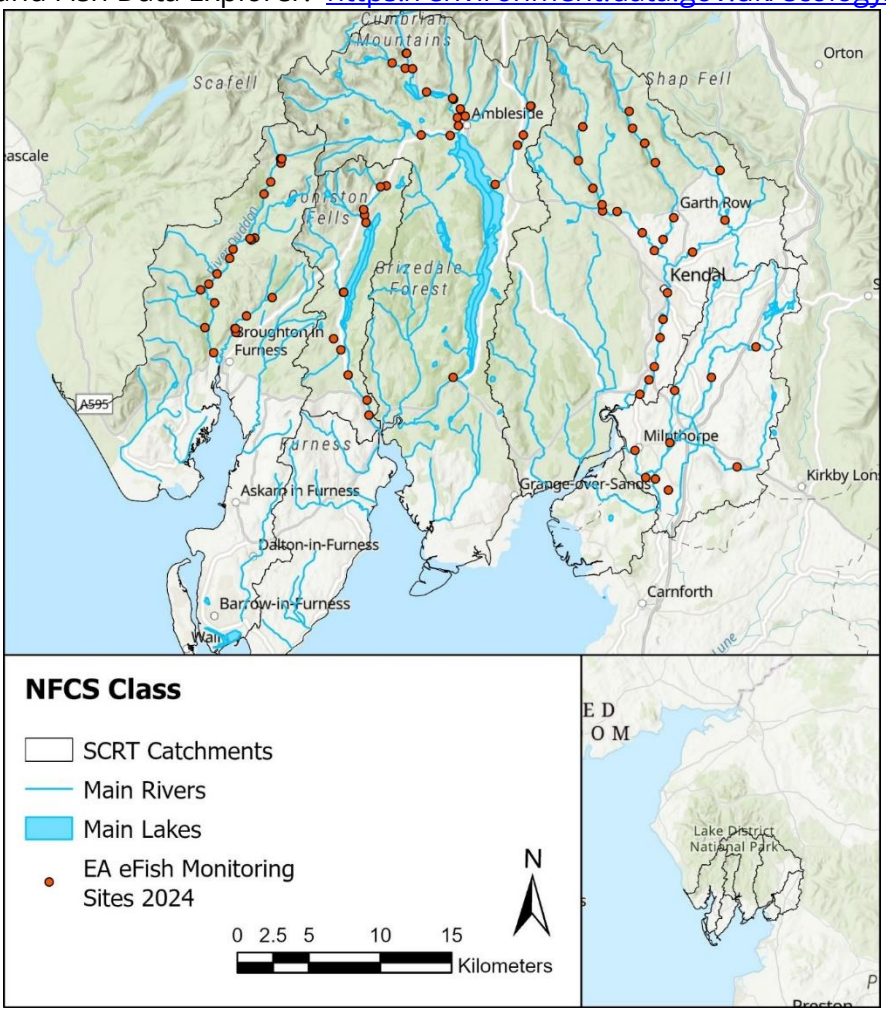



**Figure 13. Environment Agency (EA) electrofishing sites 2024.**

### *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 2024 had relatively good conductivity, although some reaches in the upper Duddon, and upper Sprint experienced 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. Data from surveys after 2021 can be found in the e-fish reports.

You can view a copy of the maps by clicking here.
You can view past reports 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, 2024 data is not yet available.

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.

For further information the 2023 report can be found here: Assessment of Salmon Stocks and Fisheries in England and Wales

## 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.

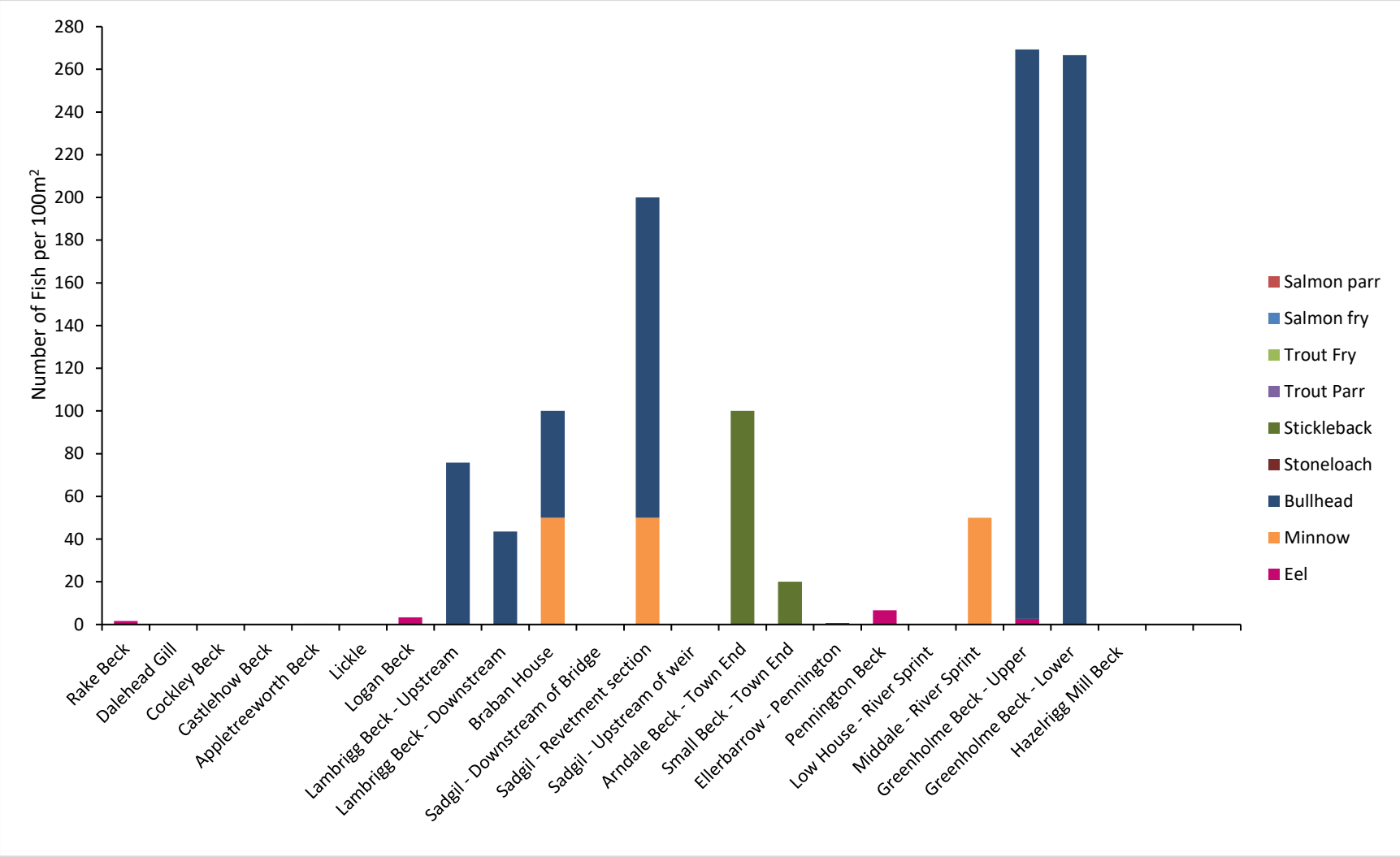



**Figure 14. Abundance of all fish species recorded during 2024 surveys. Note this has been adjusted for density however, it has not been adjusted to take into account the fact that surveys were semi-quantitative.**

## 8. Next Steps for 2025

There will be a continued focus on expanding the programme. 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 2024.*

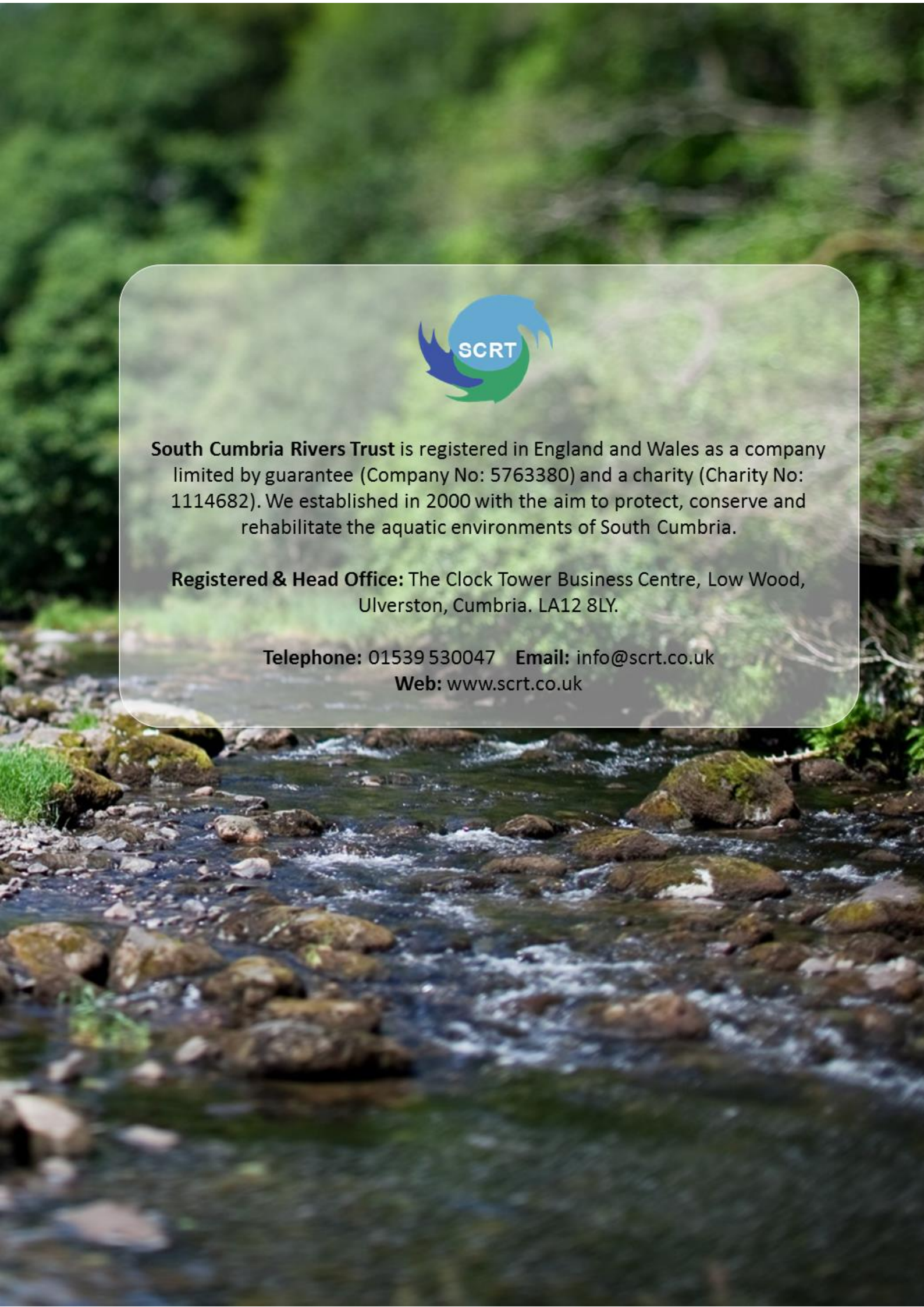
| No. | Site Name | Catchment | No. Salmon Fry | Total No. per 100m2 | Salmon Fry NFCS Classification | No. Salmon Parr | Total No. per 100m2 | Salmon Parr NCFS Classification | No. Trout Fry | Total No. per 100m2 | Trout Fry NCFS Classification | No. Trout Parr | Total No. per 100m2 | Trout Parr NCFS Classification |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Rake Beck | Duddon | 0 | 0.00 | F | 1 | 3.77 | D | 21 | 65.24 | A | 3 | 8.91 | C |
| 2 | Dalehead Gill | Duddon | 0 | 0.00 | F | 0 | 0.00 | F | 3 | 5.83 | D | 0 | 0.00 | F |
| 3 | Cockley Beck | Duddon | 0 | 0.00 | F | 0 | 0.00 | F | 0 | 0.00 | F | 0 | 0.00 | F |
| 4 | Castlehow Beck | Duddon | 0 | 0.00 | F | 0 | 0.00 | F | 12 | 37.28 | B | 0 | 0.00 | F |
| 5 | Appletreeworth Beck | Duddon | 0 | 0.00 | F | 0 | 0.00 | F | 24 | 16.95 | C | 24 | 16.19 | B |
| 6 | Lickle | Duddon | 0 | 0.00 | F | 0 | 0.00 | F | 30 | 19.42 | B | 17 | 10.51 | C |
| 7 | Logan Beck | Duddon | 0 | 0.00 | F | 0 | 0.00 | F | 1 | 0.60 | E | 4 | 2.28 | D |
| 8 | Lambrigg Beck - Upstream | Kent | 0 | 0.00 | F | 0 | 0.00 | F | 14 | 20.59 | B | 14 | 19.68 | B |
| 9 | Lambrigg Beck - Downstream | Kent | 0 | 0.00 | F | 0 | 0.00 | F | 22 | 18.57 | B | 4 | 3.23 | D |
| 10 | Braban House | Kent | 0 | 0.00 | F | 0 | 0.00 | F | 0 | 0.00 | F | 0 | 0.00 | F |
| 11 | Sadgil - Downstream of Bridge | Kent | 0 | 0.00 | F | 0 | 0.00 | F | 8 | 4.44 | D | 4 | 2.12 | D |
| 12 | Sadgil - Revetment section | Kent | 0 | 0.00 | F | 0 | 0.00 | F | 7 | 5.44 | D | 9 | 6.68 | C |
| 13 | Sadgil - Upstream of weir | Kent | 0 | 0.00 | F | 0 | 0.00 | F | 2 | 1.29 | E | 8 | 4.95 | D |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | Arndale Beck - Town End | Winster | 0 | 0.00 | F | 0 | 0.00 | F | 26 | 50.49 | A | 10 | 18.55 | B |
| 15 | Small Beck - Town End | Winster | 0 | 0.00 | F | 0 | 0.00 | F | 0 | 0.00 | F | 0 | 0.00 | F |
| 16 | Ellerbarrow - Pennington | Poaka | 0 | 0.00 | F | 0 | 0.00 | F | 23 | 29.77 | B | 12 | 14.84 | B |
| 17 | Pennington Beck | Poaka | | 0.00 | F | 0 | 0.00 | F | 56 | 72.49 | A | 0 | 0.00 | F |
| 18 | Low House - River Sprint | Kent | 5 | 9.60 | D | 0 | 0.00 | F | 11 | 18.99 | B | 2 | 3.30 | D |
| 19 | Middale - River Sprint | Kent | 3 | 3.70 | E | 0 | 0.00 | F | 40 | 44.38 | A | 0 | 0.00 | F |
| 20 | Greenholme Beck - Upper | Crake | 4 | 23.04 | C | 0 | 0.00 | F | 29 | 150.16 | A | 1 | 4.95 | D |
| 21 | Greenholme Beck - Lower | Crake | 11 | 63.35 | B | 0 | 0.00 | F | 20 | 103.56 | A | 3 | 14.84 | B |
| 22 | Hazelrigg Mill Beck | Leven | 0 | 0.00 | F | 0 | 0.00 | F | 17 | 132.04 | A | 14 | 103.90 | A |
| 23 | Hazelrigg Trib | Leven | 0 | 0.00 | F | 0 | 0.00 | F | 1 | 7.77 | D | 3 | 22.26 | A |

## Appendix II

*Densities per 100m$^2$ 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 (0to 9, 10 to 99, 100 to 999 etc.)*

| | Area Adjusted | | | | | | |
|---|---|---|---|---|---|---|---|
| **Site Name** | **Eel** | **Lamprey** | **Minnow** | **Bullhead** | **Stoneloach** | **Stickleback** | **Marine Species** |
| Rake Beck | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dalehead Gill | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cockley Beck | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Castlehow Beck | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Appletreeworth Beck | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lickle | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Logan Beck | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lambrigg Beck - Upstream | 0 | 0 | 0 | 76 | 0 | 0 | 0 |
| Lambrigg Beck - Downstream | 0 | 0 | 0 | 43 | 0 | 0 | 0 |
| Braban House | 0 | 0 | 50 | 50 | 0 | 0 | 0 |
| Sadgil - Downstream of Bridge | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sadgil - Revetment section | 0 | 0 | 50 | 150 | 0 | 0 | 0 |
| Sadgil - Upstream of weir | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Arndale Beck - Town End | 0 | 0 | 0 | 0 | 0 | 100 | 0 |
| Small Beck - Town End | 0 | 0 | 0 | 0 | 0 | 20 | 0 |
| Ellerbarrow - Pennington | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pennington Beck | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Low House - River Sprint | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Middale - River Sprint | 0 | 0 | 50 | 0 | 0 | 0 | 0 |
| Greenholme Beck - Upper | 3 | 0 | 0 | 267 | 0 | 0 | 0 |
| Greenholme Beck - Lower | 0 | 0 | 0 | 267 | 0 | 0 | 0 |
| Hazelrigg Mill Beck | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hazelrigg Trib | 0 | 0 | 0 | 0 | 0 | 0 | 0 |



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