# Habitat Characterisation Survey

## Electrofishing Results Summer 2015

By

West Cumbria Rivers Trust

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# Executive Summary

West Cumbria Rivers Trust (WCRT) embarked on its first electrofishing and habitat characterisation survey over the summer months in 2015. Using backpack equipment and the five minute semi quantitative survey technique the following two key objectives were delivered:

- to report populations of juvenile salmonid fry (i.e. those aged less than one year) at the 89 sites surveyed, and
- to give an overview of the physical character of and around those sites (referred to as the "Catchment Condition" in the report) and provide an overall assessment of their potential for future improvement.

The populations of juvenile salmonids were reported at the sites surveyed and data for salmonid fry populations is shown in detail by the maps in section 4 of the report:

- Figure 1 – a catchment wide map showing salmonid fry occurrence and proportions for each species (or absence where neither species was found) at each site.
- Figures 2 – 12; individual tributary maps showing trout and salmon fry at each of our sites grouped (separately for each species) into occurrence categories A – E for each species.

The table below summarises an overview of the fry survey results.

| Derwent Fry 2015 – headlines | Salmon fry | Trout fry |
|---|---|---|
| Sites surveyed | 89 | 89 |
| Total fry recorded | 631 | 1118 |
| Average fish per site | 7.1 | 12.5 |
| Number of sites where no fry recorded | 51 | 7 |
| Percentage of sites where no fry recorded | 57% | 8% |
| | | |

# 1. Introduction

## 1.1 Acknowledgement and thanks

1.1.1 This is the first major project which West Cumbria Rivers Trust (WCRT) has undertaken with funding entirely from within the Derwent catchment. This project could not have been undertaken without the enthusiastic support of a number of organisations and individuals. In particular WCRT would like to highlight:

1.1.2 The co-operation from landowners and tenants in permitting access to their property,

1.1.3 The volunteer time from a large number of individuals who turned out to assist the Trust's team with the site surveys.

1.1.4 All of the organisations and individuals who contributed financially to the project including Lord Egremont, the River Corridors Group (part of Bassenthwaite Reflections), Derwent Owners Association (DOA) plus the fishing associations from Cockermouth, Keswick and Isel (BGFA) and some individuals.

1.1.5 The EA officers based at Penrith for the contribution of their expertise.

1.1.6 Colleagues at other Rivers Trusts who provided assistance – particularly at Eden, Ribble and West Country RT's.

## 1.2 Thanks from the board of Trustees

1.2.1 To all who contributed the Board of Trustees at WCRT extends its most sincere thanks. The Board believes this report will provide a sound data base to assist with planning future environmental improvement projects as well as a solid foundation to build our collective knowledge of the riverine habitat in the Derwent catchment and its juvenile salmonid populations in future years.

# 2 Objectives

## 2.1 The key objectives

2.1.1 The two key objectives which were set in the Project Plan in May 2015 are delivered in this report:

2.1.2 To report populations of juvenile salmonid fry (i.e. those aged less than one year) at the 89 sites surveyed, and

2.1.3 To give an overview of the physical character of and around those sites (referred to as the "Catchment Condition" in the report) and provide an overall assessment of their potential for future improvement.

# 3 Data Collection

## 3.1 The Data Collected

3.1.1 The data collected for each site include site location, date surveyed, fish numbers (by size & number for salmonids & by number only for six other species), habitat data which includes type of substrate in the channel (boulders, cobbles, silt etc.), occurrence of plant life and large woody debris. For each bankside, details of erosion and damage, fencing, vegetation, and adjacent land use were also recorded.

3.1.2 Using the salmonid fish data two primary goals can be delivered: firstly to identify and record different levels of juvenile salmonid populations at each site and secondly to detect change in those populations in future years at a scale which WCRT and others are likely to be able to carry out future repair and restoration works.

3.1.3 Fish surveys at each of the chosen sites were carried out using a standard “back pack” electro fishing set. After a set time of 5 minutes at each site the surveyors identify, count and measure the fish, before returning them to the water. This is known as the “semi-quantitative” method of carrying out electro fishing surveys.

3.1.4 EA carries out a much smaller number of larger, area based surveys (described as ‘fully quantitative triple pass depletion surveys’) and they use those results to grade each site against a national data base.

3.1.5 Once sufficient data from our 5 minute surveys have been accumulated then the more detailed data from EA surveys can be used to calibrate the results from the 5 minute surveys so that our (5 minute) results can be converted into “number per 100m2 water surface area” (which is the nationally used unit of measurement) and would allow us to compare our data with other researchers. WCRT has been advised that results from a single year such as reported here provide insufficient data to allow meaningful comparisons and therefore that calibration work has not been done in 2015 for the Derwent. WCRT is further advised that a minimum of three years of data will be required before this task can be meaningfully undertaken.

3.1.6 The habitat data collected at each site provides the basis for the “Catchment Characterisation” report given in section 5 and appendix 1. The habitat condition on 28 tributaries, becks and gills is reported and, in addition to reporting on the existing condition, the areas which are likely to benefit from differing degrees of future work are also identified.

3.1.7 For the “Catchment Condition” section of the report each tributary has been categorised into one of three groupings (adapted from the system used on the River Tweed) depending on the data found; these groupings are described as either “Maintain”, “Repair”, or “Restore” which are defined in section 5.1.

3.1.8 The River Derwent Conservation Action Plan prepared by the Chairman of the DOA and subsequently adopted by the DOA identifies “habitat improvement” as one of its five action areas which are all directed towards improving salmon numbers in the Derwent catchment. The information provided in the “Catchment Condition” section of this report links closely with and directly supports the DOA action area.

3.1.9 Some important points of detail to note:

- Fish populations are naturally extremely variable, both within rivers and through time. So results from a single year cannot provide statistically sound measures of population (for comparison with other data) and changes in that population.

- Notwithstanding that reservation our surveys are excellent for highlighting anomalous areas within the river system, and the environmental data collected in the field are as valuable as the actual fish results for assisting in identifying areas for potential future action.
- The numerical result for each survey site is assigned to one of five classes designated A - E. This classification A (the top quartile), B (the second quartile), C (the third quartile), D (the bottom quartile) and E (absent) and is specific to the Derwent catchment results from 2015. (NB: the quartiles of a ranked set of data values are the three points that divide the data set into four equal groups, each group comprising a quarter of the data. The first quartile (Q1 or D) is defined as the middle number between the smallest number and the median of the data set. The second quartile (Q2 or C) is the median of the data. The third quartile (Q3 or B) is the middle value between the median and the highest value of the data set. Q4 or A is the top quartile.)

3.1.10 GIS software was then used to plot these results onto the maps which appear in section 4 of this report.

3.1.11 The WCRT surveys specifically target salmonid fry and therefore take place in fry habitat. The numbers reported are of fry only for salmon and for trout. Of course larger, older fish are encountered during many fry surveys, and their details are recorded. However, as those larger, older fish are not the survey target, there is not a method which gives us definite numbers for those larger fish and their numbers and are therefore not included in this report. The results show that parr or older fish have been encountered (or not) and maybe on some rivers are encountered more frequently than on others.

3.1.12 Each site survey also records other species of fish including minnows, stone loach, eels and lampreys; as with larger fish these species are not the target of the surveys and are not reported here.

# 4 Populations of Juvenile Salmonids

## 4.1 Report of populations of juvenile salmonids at the sites surveyed.

4.1.1 Data for salmonid fry populations is shown in the figures below:

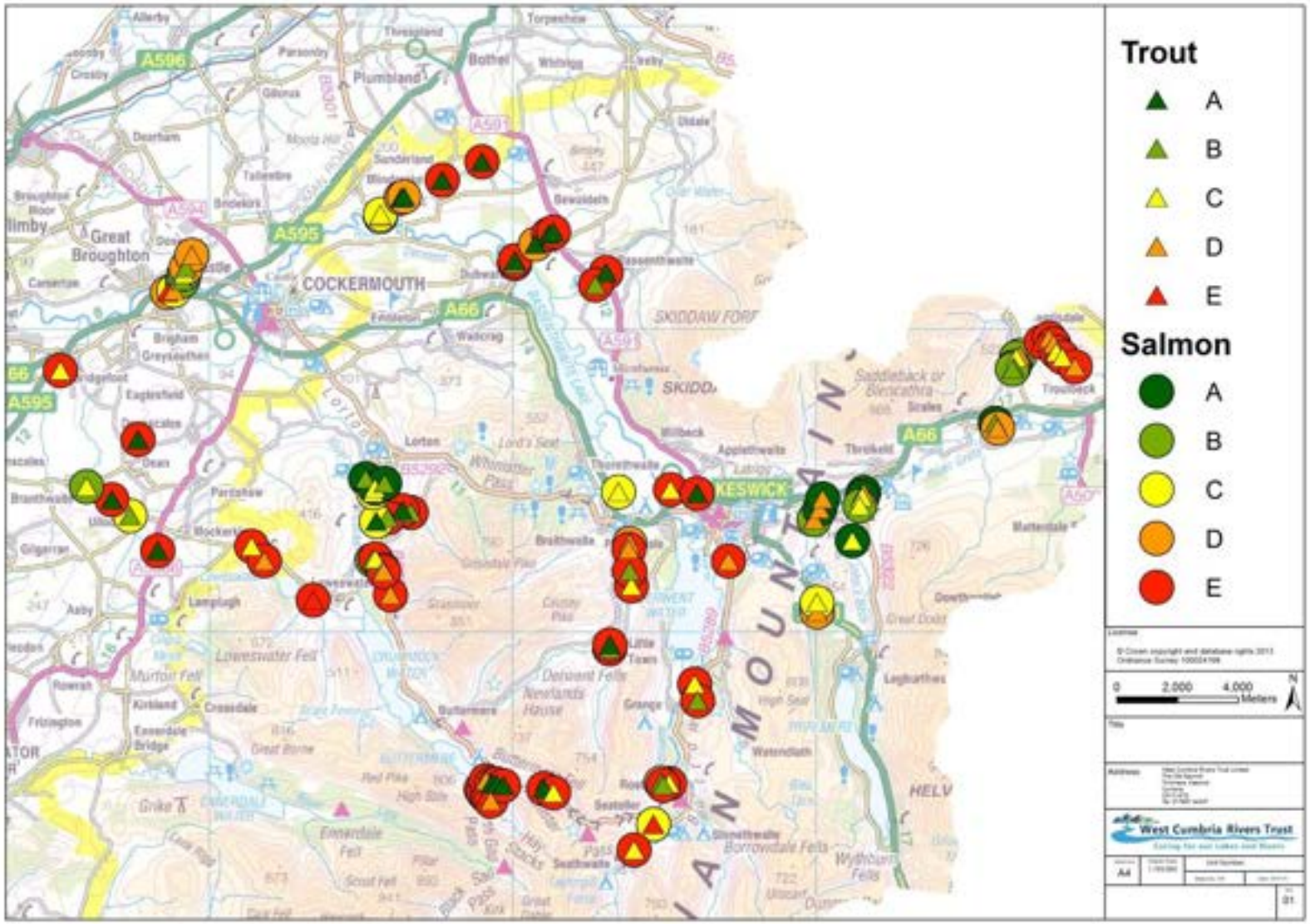
- Figure 1 – catchment wide map showing salmonid fry occurrence and proportions for each species (or absence where neither species was found) at each site.
- Figures 2 – 11; individual tributary maps showing trout and salmon fry at each of our sites grouped (separately for each species) into occurrence categories A – E for each species.

## 4.2 Comparison with Quantitative Surveys

4.2.1 Although direct comparison with EA fully quantitative surveys cannot be made (see 3.1.4 & 3.1.5 above) the results from the EA from their surveys in earlier years have been considered. In addition to the absence of calibration surveys by WCRT in 2015 the location of sites in the two data sets differs and the number of sites in the WCRT survey is significantly greater than those covered by EA. However, and notwithstanding those differences, the general picture from the overall comparison is that areas of the catchment which have been at the better end of the results in earlier years remain at that better end in 2015 (e.g.; ST Johns & R. Glenderamackin):

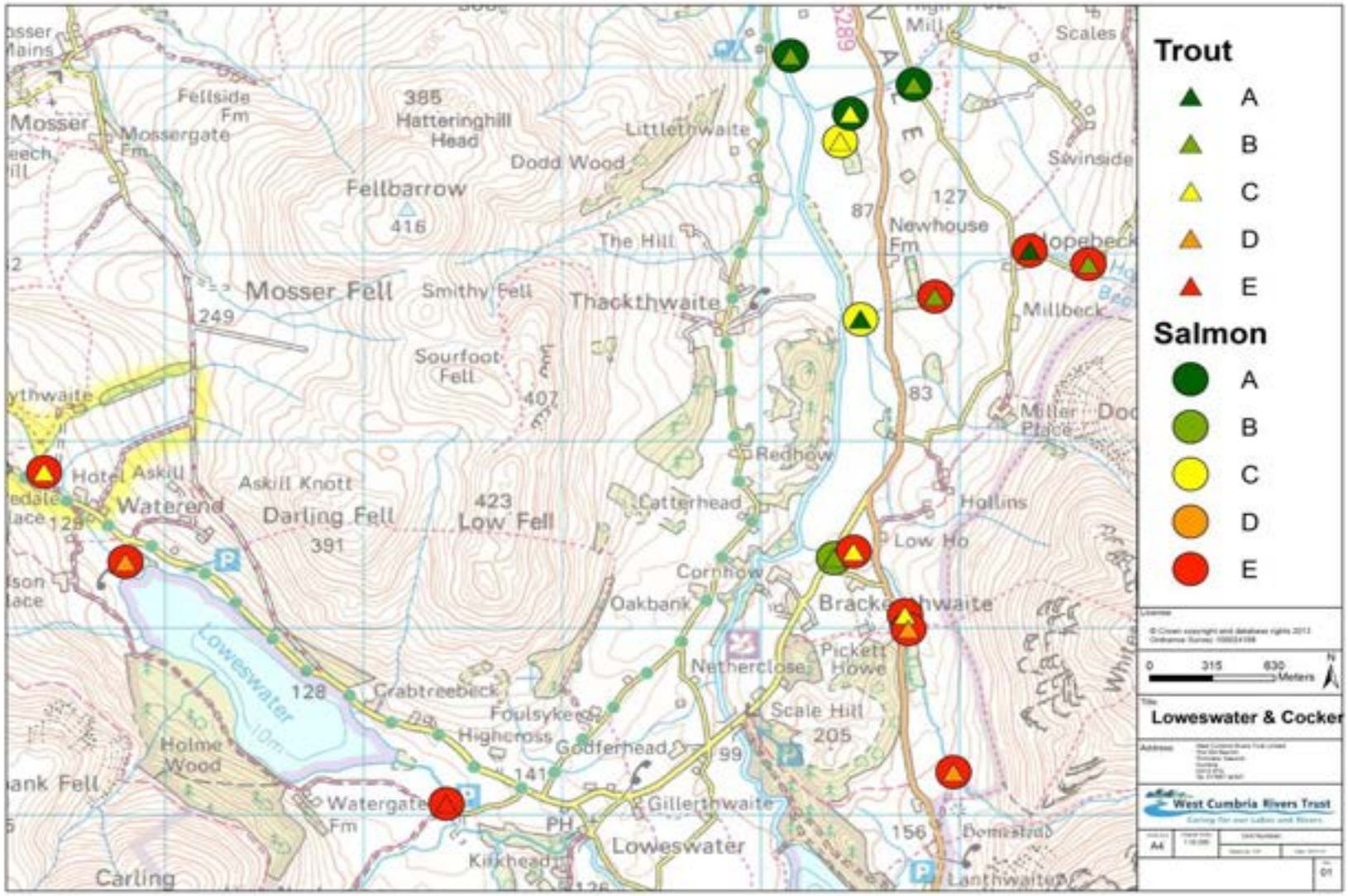
similarly those areas where poorer results in earlier years have been recorded remain at that poorer end of the results spectrum.

Figure 1: Catchment wide map of all sites



## Figure 2: River Marron

Figure 3: Cocker catchment.



## Figure 4: Buttermere.

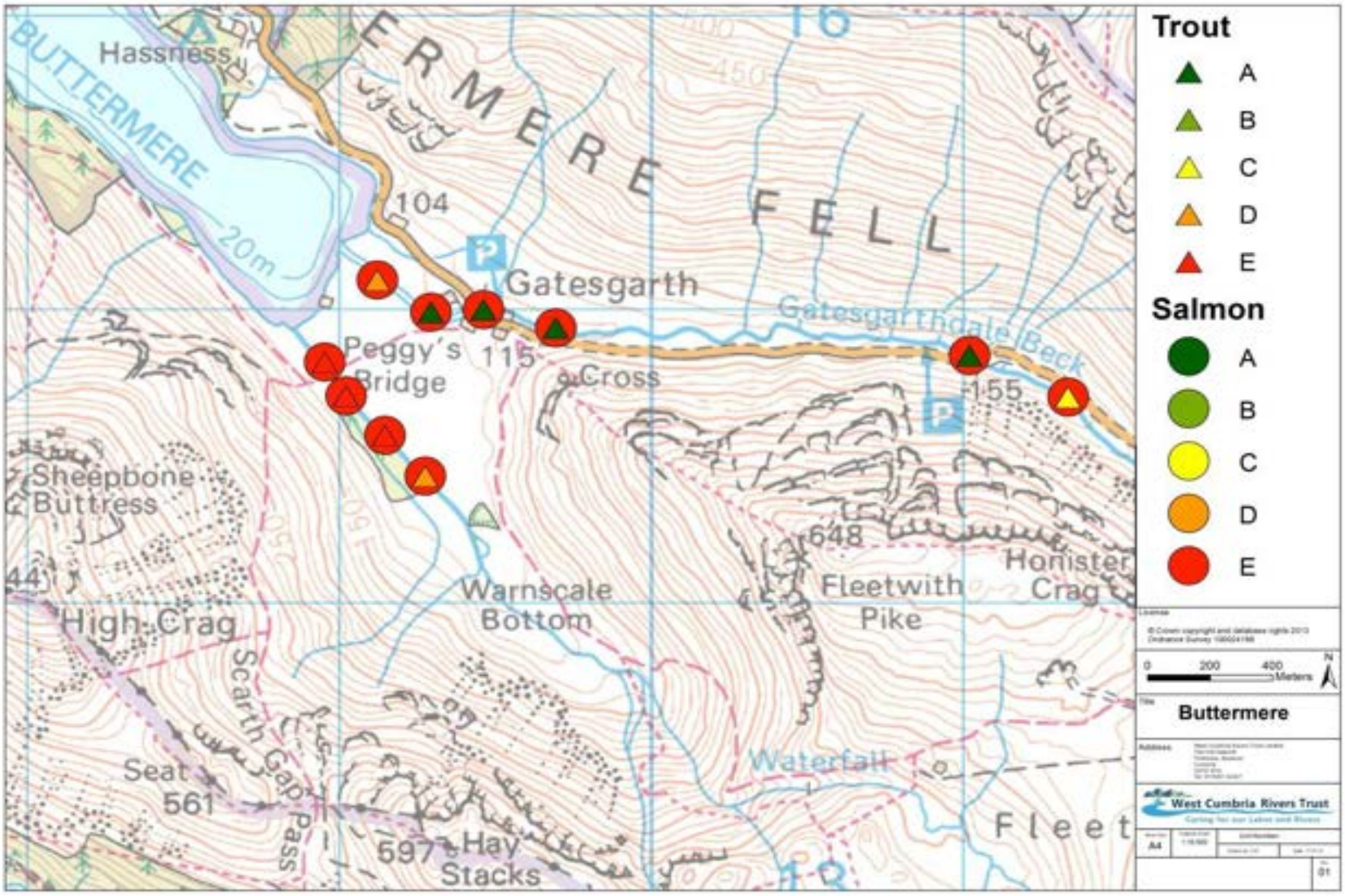
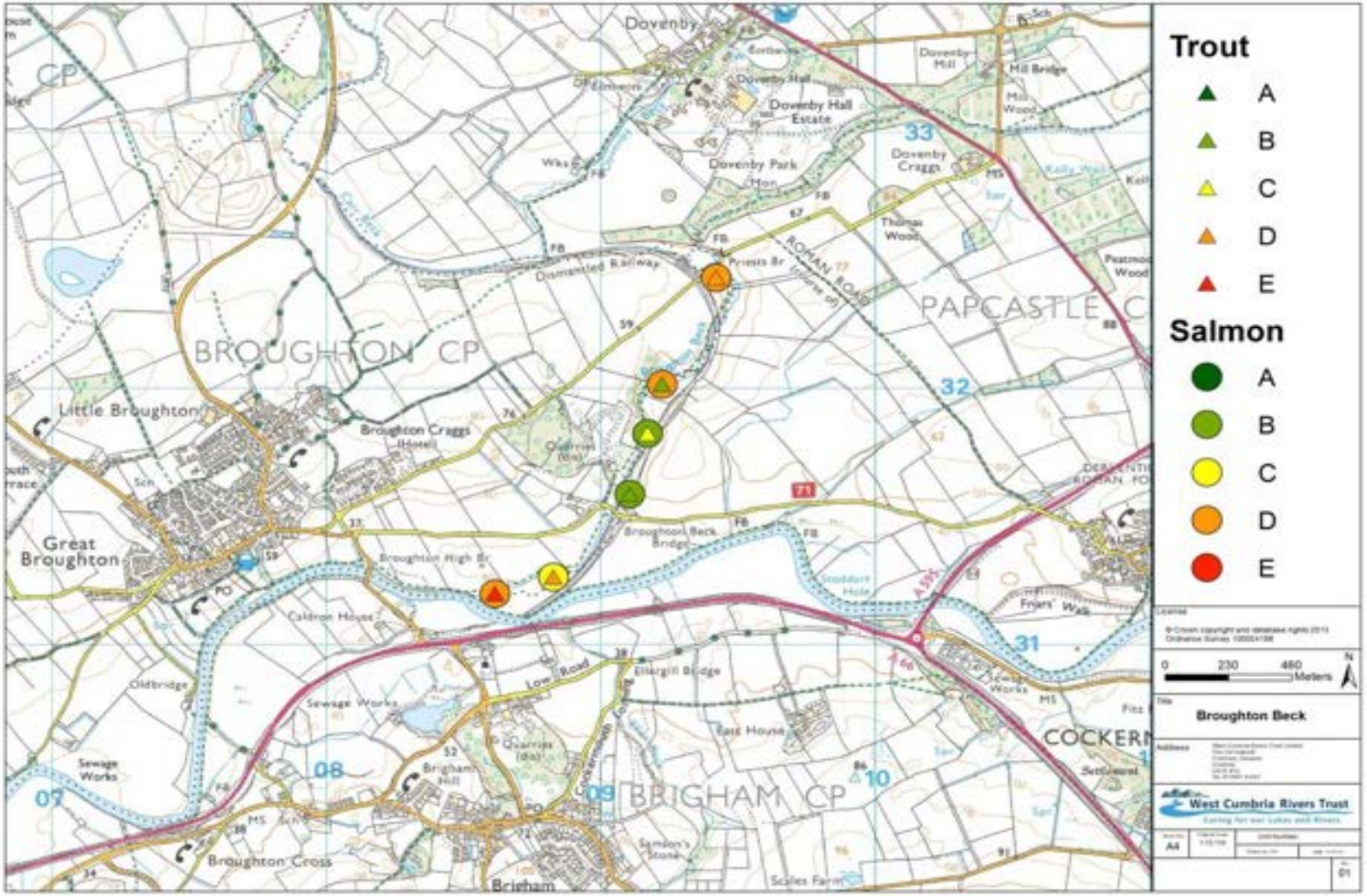
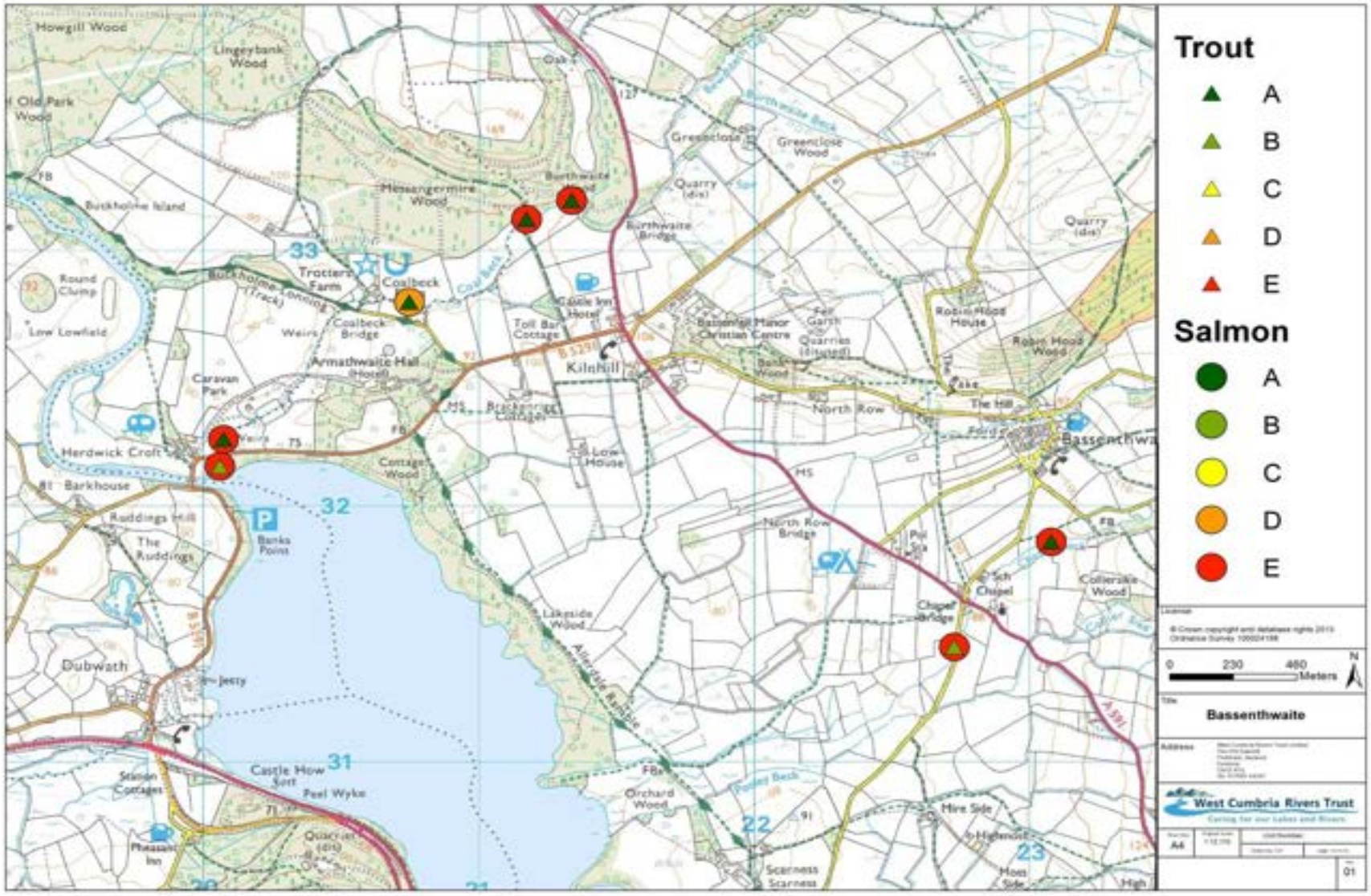


Figure 5: Broughton Beck.



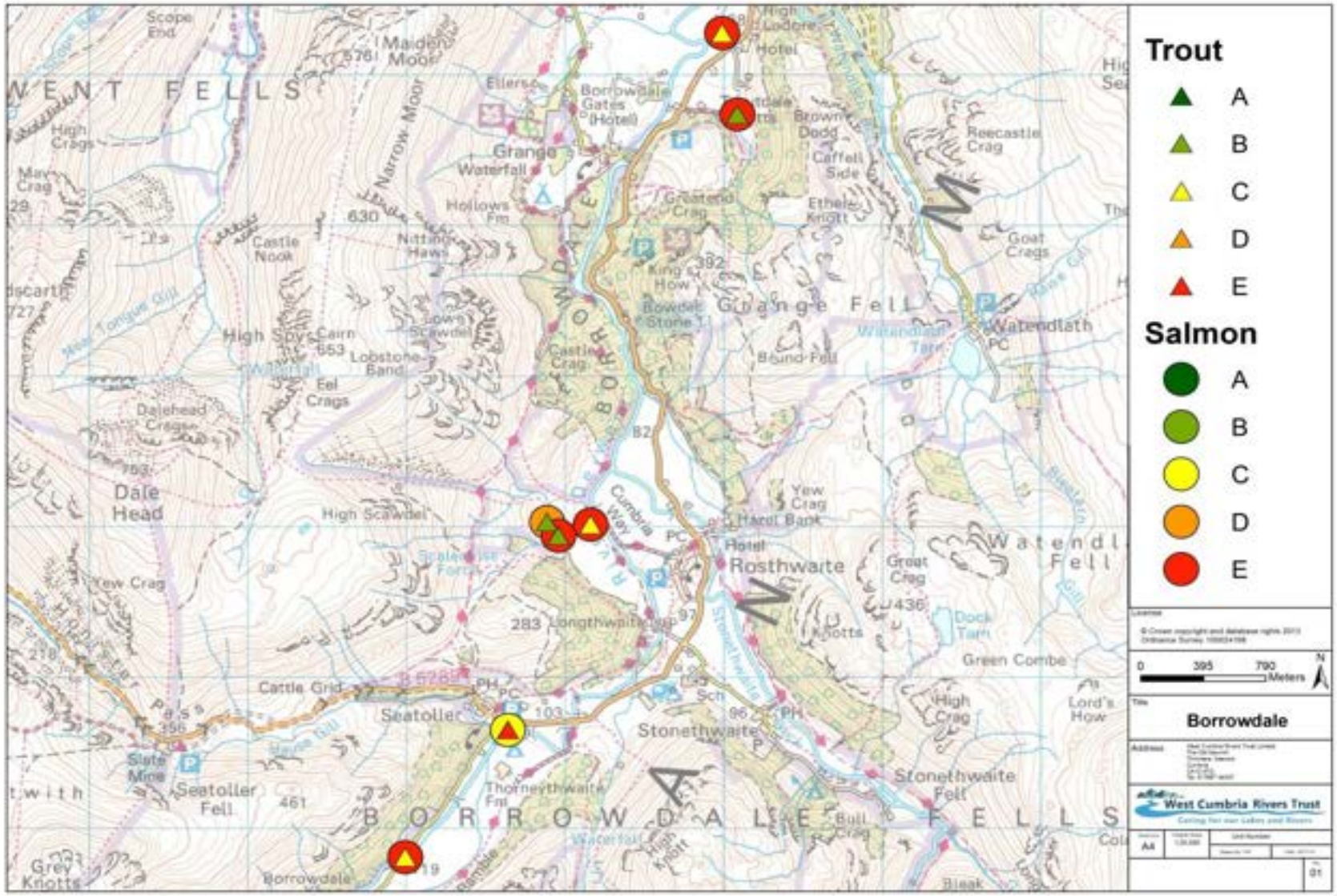
## Figure 6: Blumer Beck.

Figure 7 Bassenthwaite

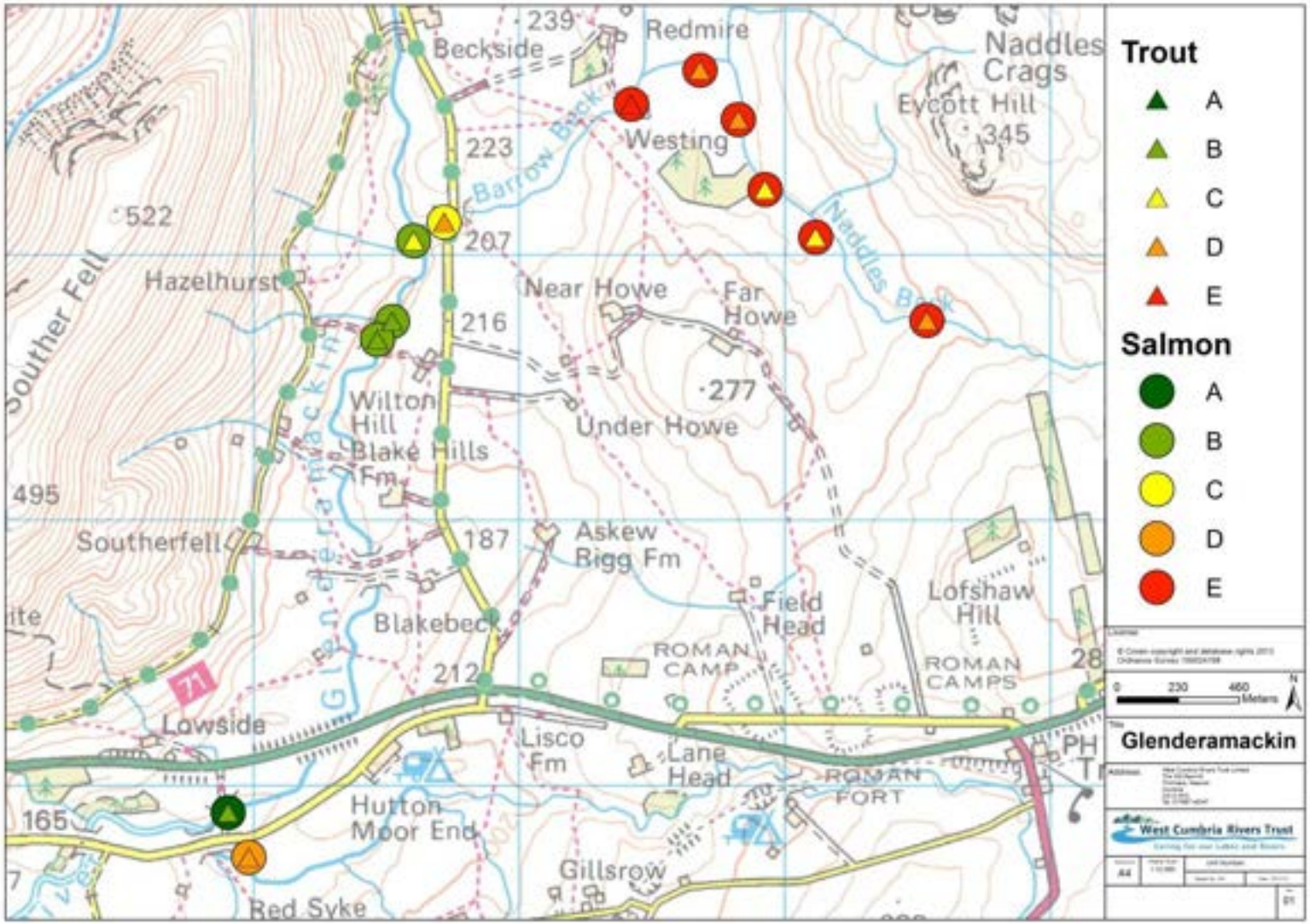


## Figure 8 Keswick Area

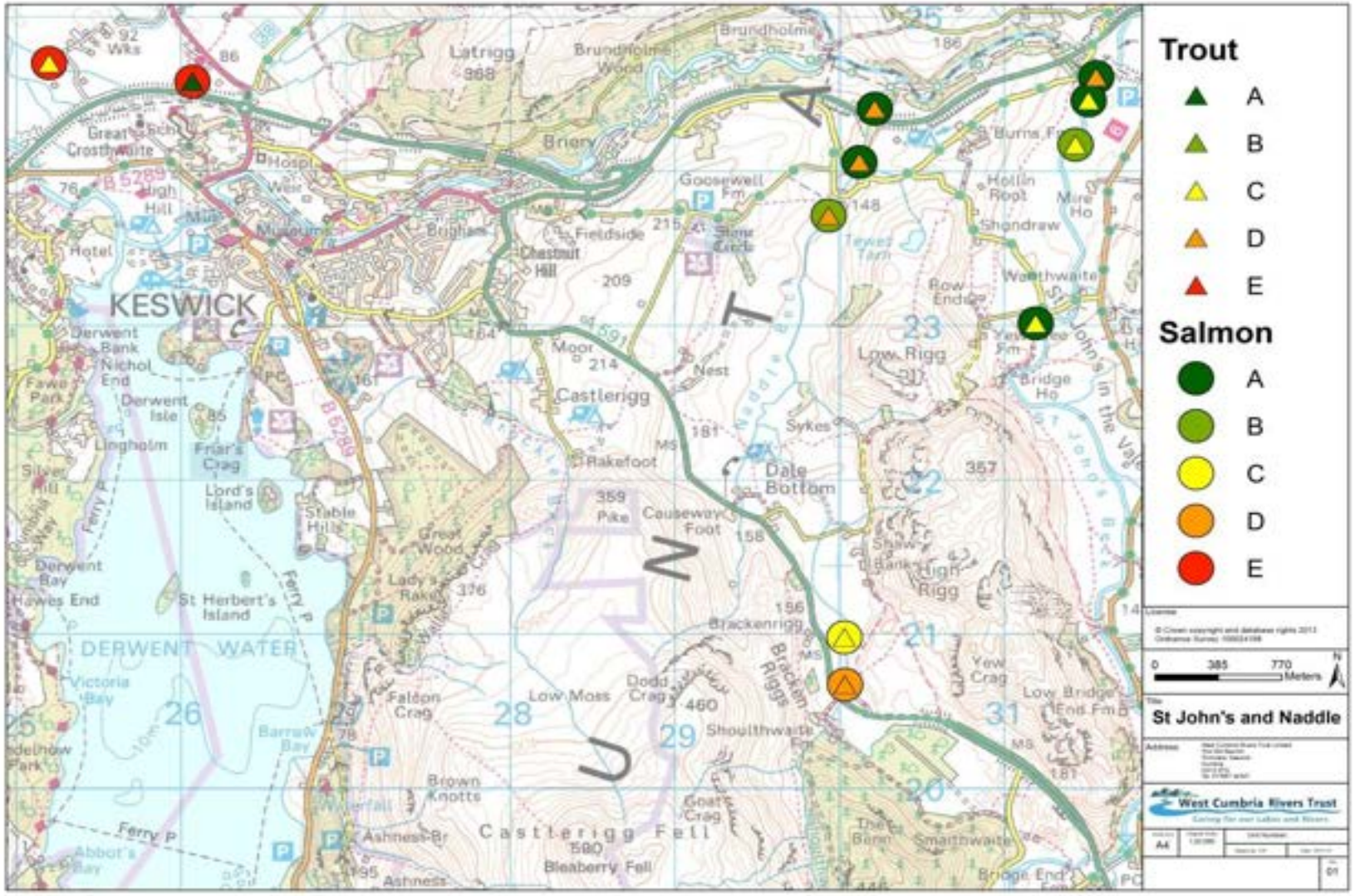
## Figure 9 Borrowdale



## Figure 10 Glenderamackin



## Figure 11 St Johns and Naddle Beck



# 5 Catchment Characterisation Report.

## 5.1 Electrofishing Results

5.1.1 Appendix 1 sets out a detailed summary of the electrofishing results and habitat condition on each of 28 tributaries surveyed together with an outline of the opportunities which exist on each.

5.1.2 Each tributary is grouped into one of the three categories defined as either:-

- "**Maintain"** - where limited small scale works such as insertion of large woody debris may be beneficial but little additional substantive work is necessary, or
- **"Repair"** - where further modest work of a limited nature such as creating buffer strips with new fencing, provision of new gravels & boulders where appropriate, insertion of willow spilling and other tree & shrub planting as well as insertion of large woody debris will be beneficial, or
- **"Restore"** - where major channel restoration works such as re-routing the channel and associated full restoration works are necessary in order to achieve substantive improvement.

5.1.3 Of the 28 tributaries considered in 2015 the above three category method of assessment shows 8 categorised as "Maintain" (28%), 16 as "Repair"(58%) & 4 as "Restore" (14%) with a further 4 "Restore" options in the longer term.

5.1.4 An estimate of the potential scope for future works on areas not surveyed in 2015 is given in section 7 of this report.

5.1.5 The full impact of the major floods in December 2015 has not been fully assessed by the time this report was completed: changes caused by that event will be picked up and assessed in detail in future surveys.

# 6 Water Framework Directive Classification

## 6.1 Derwent Classification

6.1.1 Across the Derwent catchment 33 water bodies are identified in the WFD, (24 in the Derwent sub Catchment, 9 in the Cocker Sub catchment), which are classified between "good" & "poor". However the physical scale of the Water Framework Directive (WFD) water bodies and the scale of the tributaries considered in this catchment characterisation section of this report are very different; the WFD water bodies are much larger than the tributaries considered here with the result that multiple sites considered here can fall within one WFD water body.

6.1.2 The area covered by each WFD water body is considered to be on too large a scale to contribute to the substance of this report and as such comparisons cannot be made.

6.1.3 Up to date WFD water body classification data can be found at:

http://environment.data.gov.uk/catchment-planning/ManagementCatchment/17

# 7 Future Years

## 7.1 Scope of work for Future Years

7.1.1 The "Catchment Tree" (CT) included in appendix 2 sets out a listing of all the main sub-catchments and tributaries in the Derwent catchment and provides a quick point of reference to show the opportunities for future habitat improvement works.

7.1.2 The CT identifies a total of around 130 separate sections of river and tributaries (including becks and gills) identified by name across the catchment (note that there are many more unnamed becks & gills not included in these numbers).

7.1.3 Data was gathered during 2015 from 28 tributaries, becks and gills which represent approximately 21% of the total number of named tributaries, becks and gills identified in the CT.

7.1.4 On the basis that the sample used in 2015 is approximately representative of all the tributaries, becks and gills then, as a ball park figure, a total of approximately 36 of those becks and tributaries would be classified as being in the "maintain" category (as defined above), approximately 74 as requiring "repair" and approximately 18 as requiring full "restoration".

7.1.5 These figures, whilst approximate, are the best evidence available to illustrate the massive potential scope for further habitat improvement works required to maximise the potential production of juvenile fish and smolts across the Derwent catchment.

# 8 Survey Areas

## 8.1 Areas not surveyed

8.1.1 Areas not surveyed this year include the main stem of the river and sub-catchments. It has been noted that on the River Spey techniques are being developed to improve the potential for electro fishing using backpack technology. These developments will be reviewed in future years with a view to maximising the scope for their use on the Derwent catchment.

# 9 Next Steps

## 9.1 Further Surveys

9.1.1 Further electrofishing surveys (over and above those carried out by EA) are highly desirable during 2016 but the scope and extent of that work will be dependent on securing future funding.

9.1.2 This report outlines the range and extent of potential habitat work on the 28 tributaries now reported; however as a next step on any of those tributaries which are targeted for future work site visits will be necessary to establish the precise scope and extent of work to be undertaken along with examining the arrangement for access and ensuring all necessary consents are in place before commencement of any work.

9.1.3 Expansion of the coverage of data gathering in future years for both electrofishing and habitat surveys may be guided by reference to the "Catchment Tree" included in appendix 2.

9.1.4 It is of course acknowledged that fry surveys and habit improvements are only part of the "tool kit" of measures available and that all other opportunities to undertake funded projects across a range of work areas should be maximised.

# 10 Conclusion

## 10.1 Achievements

10.1.1 The work undertaken during 2015 has achieved the following outcomes across 28 tributaries in the Derwent catchment:

- an enlarged data base of juvenile salmonid populations
- a habitat condition data base for 28 tributaries
- a pre-December 2015 flood base line for both the above
- a gazetteer of potential future investments for use by WCRT & RCG
- a model approach to guide the expansion of the data base for use in future years

10.1.2 To capitalise on the increased data, habitat improvement projects now need to be established in detail and taken forward. Detailed project plans will be worked up for each prospective scheme such as length of fencing, quantity of willow spilling, tree planting etc. These will be developed with the wide team of partners involved with the River Corridors Group to expand coverage of similar work in 2016 and beyond.

# 11 Appendices

## Appendix 1 Catchment Character Condition

Catchment Character & Condition: Summary of Existing Condition & Opportunities on 28 Tributaries as assessed from 2015 site visits.

| Site Nos (2015) | Tributary & Location | Salmonid Fry category (2015 data) | | Existing (General condition) | Opportunities for:- | | | | | Category for future work | Key Improvements for future consideration at RCG |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Trout (A - E) | Salmon (A - E) | Note: unless otherwise stated "Flow Type" is "Pool & Riffle" | Large Woody Debris | Fencing | Substrate Improvement | Erosion prevention | Occupier Consent Potential (High - medium - Poor) | Maintain/Repair/Restore | |
| 1 to 3 | Newlands Beck (Lower): Newlands Valley | D | D - E | Poor in most places; LWD scarce: gravels eroding: mostly fenced: extensive boarded toe. Flow type - "Smooth | Extensive | None | Stabilise spawning gravels by insertion of beck | Extensive - requires major river renovation works | High | Restore | Full river restoration with introduction of meanders in medium term: boulder & wooded debris provision in short term |
| 5 & 6 | Newlands Beck (Upper) : Newlands Valley | B - C | E | Good; LWD localised. | Extensive | None | None | Limited | Unknown | Repair | Addition of large woody debris; provision of dapple shade. |
| 4 | Keskdale Beck: Newlands Valley | A | E | Good; LWD absent: no fencing. | Extensive | Extensive | None | Limited | Unknown | Repair | Addition of large woody debris; fencing: provision of dapple shade. |
| 7 | Tongue Gill: Borrowdale (lower) | E | E | Good but dries out due to raised channel | poor site for investment in short term due to frequent drying out in low flow | | | | | Restore | Full restoration to return beck to its natural course. |
| 8 | Tongue Gill: Borrowdale (upper) | B - C | D - E | Moderate; LWD limited; partly fenced. | Extensive | Limited | None | Limited | High | Restore | Addition of large woody debris and partial fencing |
| 9 | Scale Close Gill: Borrowdale | B | E | Good; LWD absent: fenced. | Extensive | Limited | None | Limited | High | Maintain | Addition of large woody debris & partial fencing |
| 10 to 12 | River Marron | A - C | B - E | Good; LWD absent; partly fenced | Extensive | Limited | None | Limited | Unknown | Repair | Addition of large woody debris and partial fencing |
| 13 | Snary Beck (Marron) | A | E | Good; no LWD | Extensive | One bank | None | Limited | Unknown | Repair | Addition of large woody debris and fencing to one bank + improvement to fish easement under A5086. |

| Site Nos (2015) | Tributary & Location | Salmonid Fry category (2015 data) | | Existing (General condition) | Opportunities for:- | | | | | Category for future work | Key Improvements for future consideration at RCG |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Trout (A - E) | Salmon (A - E) | Note: unless otherwise stated "Flow Type" is "Pool & Riffle" | Large Woody Debris | Fencing | Substrate Improvement | Erosion prevention | Occupier Consent Potential (High - medium - Poor) | Maintain/Repair/Restore | |
| 14 | Far Stock Beck (Marron) | A | E | Good; no LWD; no fencing | Extensive | Extensive | None | Limited | Unknown | Repair | Addition of fencing and large woody debris. |
| 15 | Lostrigg Beck (Marron) | C | E | Good; LWD present; site is wasteland/ wild area | Limited | N/A | None | Limited | Unknown | Review & reassess | Review beck condition over wider area than this surey site. |
| 16 to 20 | Coal Beck | A | D - E | Moderate; little LWD: partly fenced | Extensive | Limited | None | Low | High | Repair | Addition of large woody debris and partial fencing + provision of dappled shade |
| 21 to 23 | Upper Glenderamackin | B - C | B - C | Good;little LWD: mostly fenced or walled: | Extensive | Limited | None | Low | High | Repair | Addition of large woody debris and partial fencing plus provision of dappled shade. |
| 24 to 29 | Blumer Beck | A - D | B - E | Good; some LWD in forrestry section; some fencing. | Extensive | Limited | None | Low | High (mostly - but some poor) | Repair | Addition of large woody debris and limited fencing (u/s of road bridge) plus provision of dappled shade. |
| 30 to 33 | Hope Beck (Cocker) | A - B | C - E | Good; partly fenced; some LWD | Moderate | Extensive | None | Low | High | Repair | Addition of large woody debris and partial fencing |
| 44 to 48 | Liza Beck (Cocker) | B - D | B - E | Moderate in part; very poor in part; | Moderate in part | Extensive (but well back to tie in with land use changes) | None | High | High | Repair / Restore | Making room for water (land taken out of farming) in medium term: large woody debris provision in short term |
| 34 to 37 | Wanscale Beck (Buttermere | D - E | E | Poor; modified channel; no fencing; no LWD. | Extensive | Extensive | None | Low | High | Restore | Full restoration with introduction of meanders & reed beds in medium term: boulder & wooded debris provision in short term; further study required on acidity. |

| Site Nos (2015) | Tributary & Location | Salmonid Fry category (2015 data) | | Existing (General condition) | Opportunities for:- | | | | Category for future work | Key Improvements for future consideration at RCG |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Trout (A - E) | Salmon (A - E) | Note: unless otherwise stated "Flow Type" is "Pool & Riffle" | Large Woody Debris | Fencing | Substrate Improvement | Erosion prevention | Occupier Consent Potential (High - medium - Poor) | Maintain/Repair/Restore | |
| 38 to 43 | Gatesgarth Beck (Buttermer | A - D | E | Good; some LWD; some fencing. Flow type - "Artificial smooth glide" | Extensive | Extensive | None | Low | High | Repair | Addition of large woody debris and partial fencing; addition of dappled shade. |
| 49 to 51 | Glenderamackin (middle & lower) | B - D | A - C | Good; some LWD: mostly fenced. | Moderate | Limited | None | Low | High | Maintain | Some LWD opportunities; limited fencing opportunities. |
| 51A | Trout Beck | D | C | Moderate; little LWD: fenced | Extensive | None | Needs features to establish & stabilise gravel. | Low | High | Maintain | Addition of large woody debris + provision of dappled shade. |
| 52 to 54 | St. John's Beck | C | A - B | Good; little LWD; partly fenced | Extensive | Moderate | None | Low | High | Repair | Addition of large woody debris, partial fencing & provision of dappled shade. |
| 55 & 56 | Chapel Beck (Bassenthwaite | A - B | E | Good; little LWD; fenced; recent tree planting | Extensive | None | None | Low | High | Maintain | Addition of large woody debris + provision of dappled shade. |
| 57 to 62 | Broughton Beck | B - E | B - D | Lower section poor; elsewhere moderate; some LWD; no fencing. Flow type on Lower Section - "overdeepened slow glide". | Moderate | Extensive | None | High in lower section; elsewhere low | High | Repair / Restore | Narrowing and substrate provision in lower section: wooded debris, fencing to upper section & provision of dappled shade.. |

| Site Nos (2015) | Tributary & Location | Salmonid Fry category (2015 data) | | Existing (General condition) | Opportunities for:- | | | | | Category for future work | Key Improvements for future consideration at RCG |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Trout (A - E) | Salmon (A - E) | Note: unless otherwise stated "Flow Type" is "Pool & Riffle" | Large Woody Debris | Fencing | Substrate Improvement | Erosion prevention | Occupier Consent Potential (High - medium - Poor) | Maintain/Repair/Restore | |
| 63 - 68 | Eycott Hill: Naddles Beck & Barrow Beck | C - E | E | Poor: straightened channel: LWD absent: mostly unfenced: much silt pesent. | Extensive | Extensive | Good in places (gravel provision in gorge section) | Limited | High | Short term - Repair; Medium term - Restore | Short term - fencing, local gravels, boulders & woody debris. Medium term - 1. embank back from the stream along the boundary of Eycott Hill to promote channel meandering and transport of gravels. Material provision will also create wetlands & ponds on the |
| 69 to 73 | Naddle Beck | D | A - D | Good;little LWD: partly fenced | Extensive | Moderate | Good in places | Low | High | Repair | Addition of large woody debris, partial fencing & provision of dappled shade: addition of gravels in parts. |
| 74 to 78 | Borrowdale | B - E | E (+1C) | Poor: straightened channel: LWD absent: mostly unfenced. | Extensive | Extensive | None | Low | High | Repair | Addition of large woody debris and partial fencing |
| 79 to 81 | Lair Beck Keswick) | A - C | E (+1C) | Moderate: LWD largely absent: fenced in spring 2015 | Extensive | None | None | Low | High | Maintain | Addition of woody debris provision of dappled shade |
| 82 to 84 | Dub Beck (Loweswater) | C - E | E | Poor: straightened channel: LWD absent: mostly unfenced. | Extensive | Extensive | None | High in places | High | Repair/ Restore | Addition of large woody debris and partial fencing in short term; full river restoration to the section u/s of lake in medium term. |
| 85 to 88 | Whit Beck (Cocker) | B - C | A (+1C) | Excellent; recently restored channel. | Moderate | None | None | Low | High | Maintain | Addition of large woody debris |
| 89 | Whit Beck (Cocker) u/s of road | B | A | Moderate; LWD absent; no fencing; eroding. | Extensive | Extensive | None | High | High | Repair | Addition of large woody debris and partial fencing |

NB: Provision of "dappled shade" includes thinnning of existing tree cover or planting of new woodland as appropriate to the site.

## Appendix 2 - Catchment Tree

**River Derwent: Catchment Tree.**

| Sub Catch-ment Ref Nr. | Subcatchment (& main stem river) | Beck Ref Nr. | Tributary 1 | Tributary 2 | Tributary 3 | Comments |
|---|---|---|---|---|---|---|
| 1 | River Derwent, Downstream Bassenthwaite (NB: Marron & other sub-catchments are below) | 1.1 | Cloffocks Beck | | | Right bank - minor stream in Workington |
| | | 1.2 | Mill Stream | | | Left bank - mill stream from Yeart Weir |
| | | 1.3 | Copeland Gill | | | |
| | | 1.4 | Holdens Gill | | | Minor trib on right bank in Ribton area |
| | | 1.5 | Flamiggs Gill | | | |
| | | 1.6 | Ennops Gill | | | |
| | | 1.7 | Ellerbeck | | | Minor trib left bank: Brigham |
| | | 1.8 | Broughton Beck | Dovenby Beck | 1. Carr Beck & 2. Brides Beck | |
| | | 1.9 | Tommy Gill | | | Minor trib right bank in Cockermouth |
| | | 1.10 | Blumer Beck | Scalegill Beck | 1. Kiln Beck & 2. Bewaldeth Beck | |
| | | 1.11 | Coal Beck | Coal Beck (in Burthwaite Wood) | 1. Bewaldeth Gill & 2. Burthwaite Gill | |
| 2 | River Derwent, Bassenthwaite Smaller Tributaries | 2.1 | Dash Beck | Halls Beck | Hause Gill & Burntod Gill & Frozenfell Gill | |
| | | | | Chapel Beck | Mill Beck & Barkbeth Beck | |
| | | 2.2 | Pooley Beck | | | |
| | | 2.3 | Broadness Beck | Numerous un-named gills & becks | | |
| | | 2.4 | Skill Beck | Gable Gill | | Mire House area |
| | | 2.5 | Wythop Beck | Wythop Beck | Many un-named gills in Whythop Hall area | Aka Dubwath beck |
| | | 2.6 | Beck Wythop | Hagg Beck | | West bank |
| | | 2.7 | Beckstones Gill | | | Porter How |
| | | 2.8 | Newlands Beck | (Mainstem Newlands Beck) | | |
| | | 2.9 | | Coledale Beck | | |
| | | 2.1 | | Keskadale Beck | | |
| | | 2.11 | | Rigg Beck | | |
| 3 | River Derwent, Bassenthwaite To Derwentwater | 3.1 | River Derwent | | | (Mainstem Derwent, Bassenthwaite To Derwentwater) |
| | | 3.2 | | Mill Beck | Wath Beck | |
| | | 3.3 | | Applethwaite Gill | | |
| | | 3.4 | | Lair Beck | | |

## River Derwent: Catchment Tree.

| Sub Catch-ment Ref Nr. | Subcatchment (& main stem river) | Beck Ref Nr. | Tributary 1 | Tributary 2 | Tributary 3 | Comments |
|---|---|---|---|---|---|---|
| 4 | River Derwent, Derwentwater Smaller Tributaries | 4.1 | Brockle Beck | | | |
| | | 4.2 | Watendlath Beck | Blea Tarn Gill | | |
| 5 | River Derwent, Upstream Derwentwater | 5.1 | River Derwent | River Derwent | Styhead Gill & Grains Gill | (Mainstem Derwent To Thornthwaite) |
| | | 5.2 | | Stonethwaite Beck | Langstrath Beck | (Headwaters Upstream Thornthwaite) |
| | | ~~5.3~~ | | Combe Gill | | |
| | | 5.4 | | Hause Gill | | |
| 6 | River Marron | 6.1 | River Marron (Mainstem trib) | | | |
| | | 6.2 | Lostrigg Beck | | | Main trib 1 on left bank |
| | | 6.3 | Townend Beck | | | |
| | | 6.4 | Curl Beck | | | |
| | | 6.5 | Comeyflat Beck | Farstock Beck | | |
| | | 6.6 | Near stock Beck | | | |
| | | 6.7 | Black Beck | Ellergill Beck | | |
| | | 6.8 | Snary Beck | | | |
| | | 6. 9 | Wisenholme Beck | | | |
| | | 6.10 | Scallow Beck | | | |
| | | 6.11 | Collergate beck | | | |
| | | 6.12 | Liza Beck | | | Drainage beck to Cogra Moss |

## River Derwent: Catchment Tree.

| Sub Catch-ment Ref Nr. | Subcatchment (& main stem river) | Beck Ref Nr. | Tributary 1 | Tributary 2 | Tributary 3 | Comments |
|---|---|---|---|---|---|---|
| 7 | River Cocker | 7.1 | River Cocker (Mainstem trib) | | | |
| | | 7.2 | Simonscales Beck | | | Left bank |
| | | 7.3 | Paddle Beck | | | |
| | | 7.4 | Little Sandy Beck | | | |
| | | 7.5 | Sandy Beck | Mosser Beck | Cat Gill | |
| | | 7.6 | Whinfell Hall Beck | | | |
| | | 7.7 | Meregill Beck | Thackthwaite beck | | |
| | | 7.8 | Bitter Beck | | | Right Bank |
| | | 7.9 | Tom Rudd Beck | Tom Rudd Beck | | |
| | | 7.10 | Stanger Beck | | | |
| | | 7.11 | Wyhte Gill | | | |
| | | 7,12 | Whit Beck | Spout Force Beck | 1.Blaze Beck 2. Elier Beck | |
| | | 7.13 | Hope Beck | Hope Beck | | |
| | | 7.14 | Liza Beck | Liza Beck | | |
| | | 7.15 | Cinderdale Beck | | | Crummock Becks |
| | | 7.16 | Rannerdale Beck | Squat Beck | | |
| | | 7.17 | Park Beck | Mosedale Beck | | Loweswater Becks |
| | | 7.18 | | Whiteoak Beck | | |
| | | 7.19 | | Highnook Beck | | |
| | | 7.20 | | Dub Beck | | |
| | | 7.21 | Holme Beck | | | minor tributary of Loweswater |
| | | 7.22 | Crabtree Beck | | | minor tributary of Loweswater |
| | | 7.23 | Buttermere Dubs | | | Becks upstream Crummock |
| | | 7.24 | Mill / Sail Beck | | | |
| | | 7.25 | Hassnesshow Beck | | | |
| | | 7.26 | Galtsgarthdale Beck | | | |
| | | 7.27 | Warnscale Beck | | | |

## River Derwent: Catchment Tree.

| Sub Catch-ment Ref Nr. | Subcatchment (& main stem river) | Beck Ref Nr. | Tributary 1 | Tributary 2 | Tributary 3 | Comments |
|---|---|---|---|---|---|---|
| 8 | River Greta | 8.1 | River Greta | Mainstem Greta | | |
| | | 8.2 | | Glenderaterra Beck | | |
| | | 8.3 | Naddle Beck | Naddle Beck | | |
| | | 8.4 | River Glenderamackin | (Mainstem Glenderamackin) | Barrow Beck & Naddles Beck | |
| | | 8.5 | | Mosedale Beck | | |
| | | 8.6 | | Trout Beck | | |
| | | 8.7 | | Bullfell Beck | | |
| | | 8.8 | | Bannerdale Beck | | |
| | | 8.9 | St Johns Beck | Mill Gill | | |
| | | 8.10 | | Helvellyn Gill | | |