

# Know Your River Report, Usk 2019

## Salmon and sea trout catchment summary

### Introduction

This report describes the status of the salmon and sea trout populations in the Usk catchments. Bringing together data from rod catches, stock assessments and juvenile monitoring, it will describe the factors limiting the populations and set out the challenges faced in the catchment.

Actions set out habitat improvements to restore freshwater productivity of salmon and sea trout populations. These actions include work which will be carried out by our partner organisations, not just Natural Resources Wales (NRW).

NRW has a duty, defined in the Environment (Wales) Act 2016 to have Sustainable Management of Natural Resources (SMNR) at the core of everything that we do. By applying the principles of SMNR in all of our activities - from agriculture, forestry and flood defence to development planning - we are undertaking catchment-wide initiatives that will deliver for fish stock improvements. Our reports highlight the importance of considering the whole catchment when identifying and addressing fisheries issues; and of working with partners.

NRW is committed to reporting on the status of salmon stocks in all of our principal salmon rivers for the Salmon Action Plans and condition assessments under the Habitats Directive in SAC rivers; all fish species in all of our rivers are reported for the Water Framework Directive (WFD). This report will fulfil these commitments and provide an informative and useful summary of stock status and remedial work planned, for our customers, specifically anglers, fishery and land owners, as well as our partners.

### Catchment

The river Usk rises at 530m on Black Mountain in the Brecon Beacons and flows in a south-easterly direction for about 125km to the Severn Estuary at Newport. The catchment is long and narrow with typically short steep tributaries and drains an area of about 1160 km<sup>2</sup>. The catchment is largely rural in nature, being dominated by the Brecon Beacons National Park, and sparsely populated, the exceptions being Newport, Abergavenny and Brecon.

There are four reservoirs in the upper Usk catchment: the Usk, Grwyne Fawr, Talybont (on the Caerfanell) and the Crai, and a further reservoir (Llandegfedd) lower down in the catchment on the Sor Brook.

The Usk estuary at Newport is linked to an extensive area of reclaimed coastal grasslands and network of drainage channels, the Gwent Levels. These Levels are controlled by tidal flaps, sluices and weirs but are known to hold some populations of coarse fish and eels.

The Monmouthshire – Brecon canal connects Newport and Brecon with a short side branch to the Ebbw valley. The canal relies on the abstraction of water from the Usk at Brecon, just upstream of the weir, and is topped up by additional abstractions from tributaries of the Usk, the largest of which is on the Crawnon.

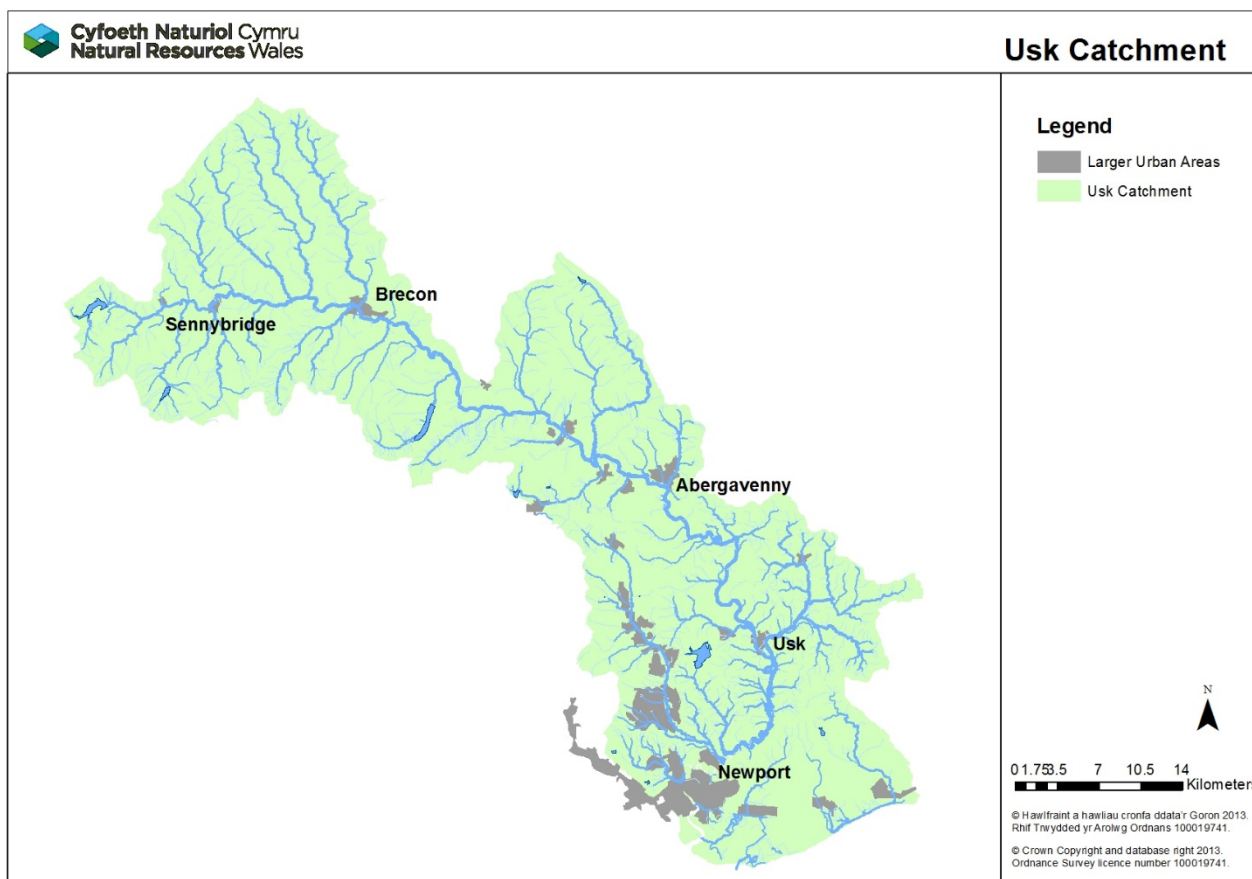


Figure 1 - Map of the Usk catchment showing the various urban areas

The river Usk and its major tributaries are designated a riverine SAC under the Habitats Directive for several rare or threatened nationally and internationally important species. These species include seven fish species - Atlantic salmon; allis and twaite shad; brook, river and sea lamprey; and bullhead.

The only significant obstruction to salmon migration on the main Usk, a weir at Brecon, was made passable in 2002 by the installation of a Larinier fish pass. A number of obstacles remain on the tributaries of the Usk, both natural e.g., the falls on the Crawnon and manmade, e.g., the weirs on the Gavenny or the dams at the bottom of the 5 reservoirs. These vary as to the degree of severity from fully impassable to partial barriers at certain flows. Work is being carried out by Natural Resources Wales and the Wye and Usk Foundation, to make some of them more easily surmounted by migrating salmon.

The river Usk is one of the premier salmon rivers in Wales, with its fishery contributing significantly to the local economy. In recent year there has been a decline in returning salmon numbers the most recent estimate of rod catches (2019) was only 216 salmon.

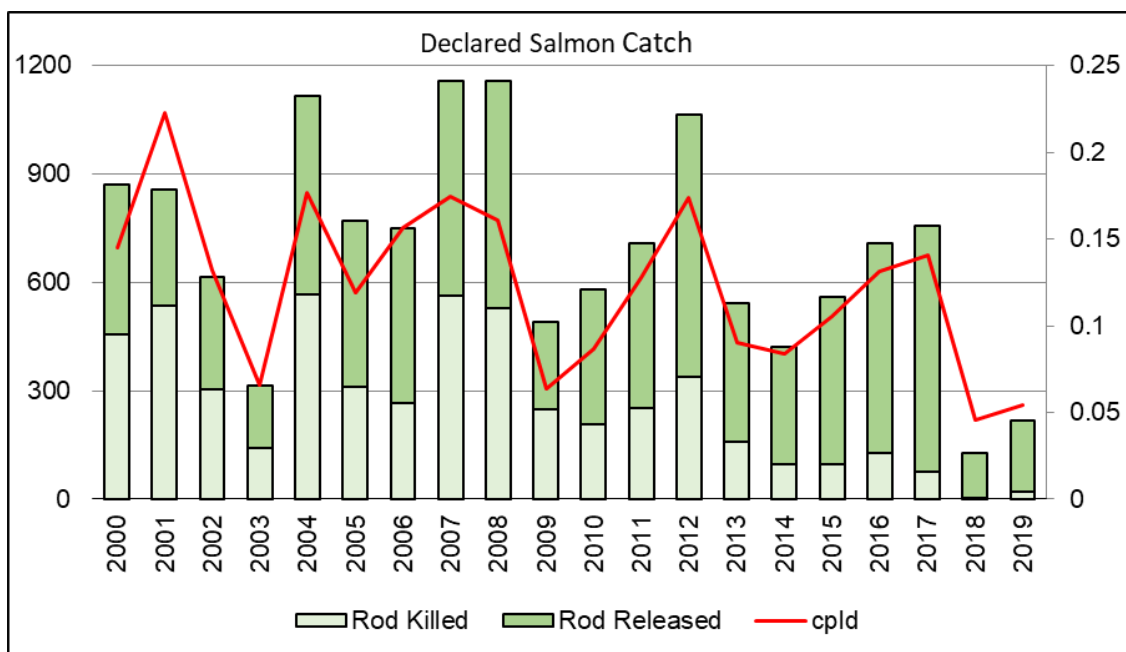
Atlantic salmon are found throughout all the accessible Usk catchment.

A small amount of sea trout fishing is supported by the Usk, with 2019 reported catches of 161 fish, a low number in comparison with many Welsh rivers but above recent average for the Usk. The Usk is better known as an important brown trout fishery than sea trout.

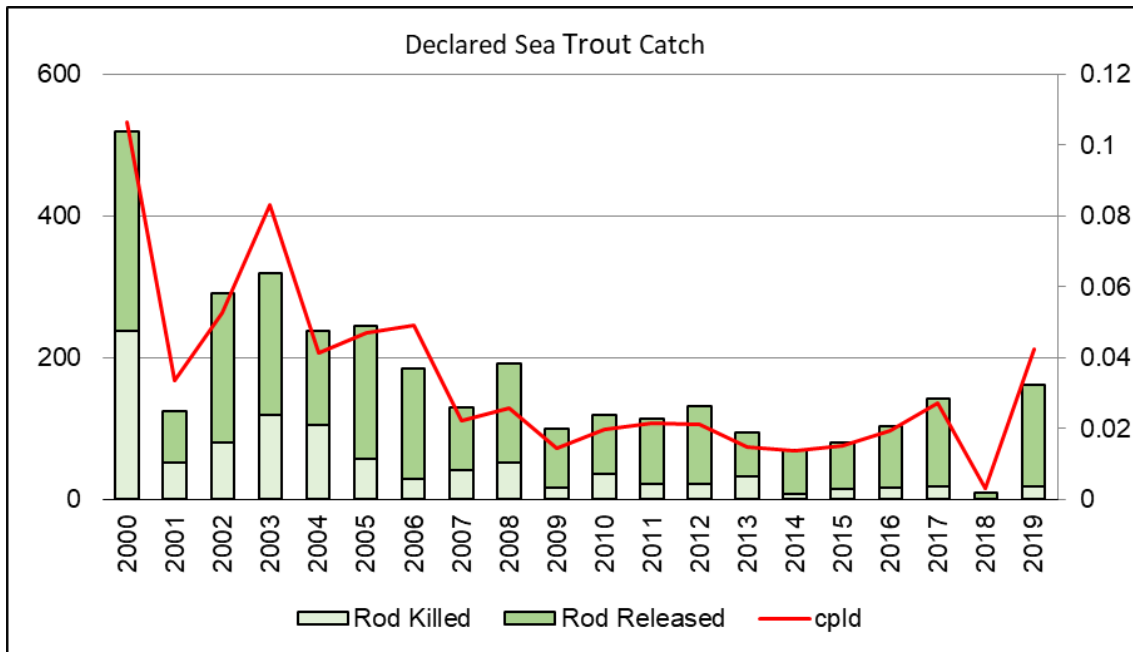
## Rod Catches

The following graphs show the total declared rod catches of salmon and sea trout on the Usk and Catch Per License Day. CPLD is an estimate of the average catch per fishing day on a catchment.

**Salmon Rod Catch** - Rod catches continue to be at extremely low levels, since 2018 there has been a collapse in the numbers of salmon caught. This is reflecting a national trend but appears slightly more severe on the Usk.



**Sea Trout Rod Catch** – Many rivers across Wales have seen declines in sea trout catches, the Usk has seen very few years of abundant catches and remains relatively stable with a low catch. As previously noted, the Usk is known for its brown trout fishery, it is highly likely that the Usk will remain a relatively poor sea trout fishery all the while brown trout grow and thrive in the main river and its tributaries.

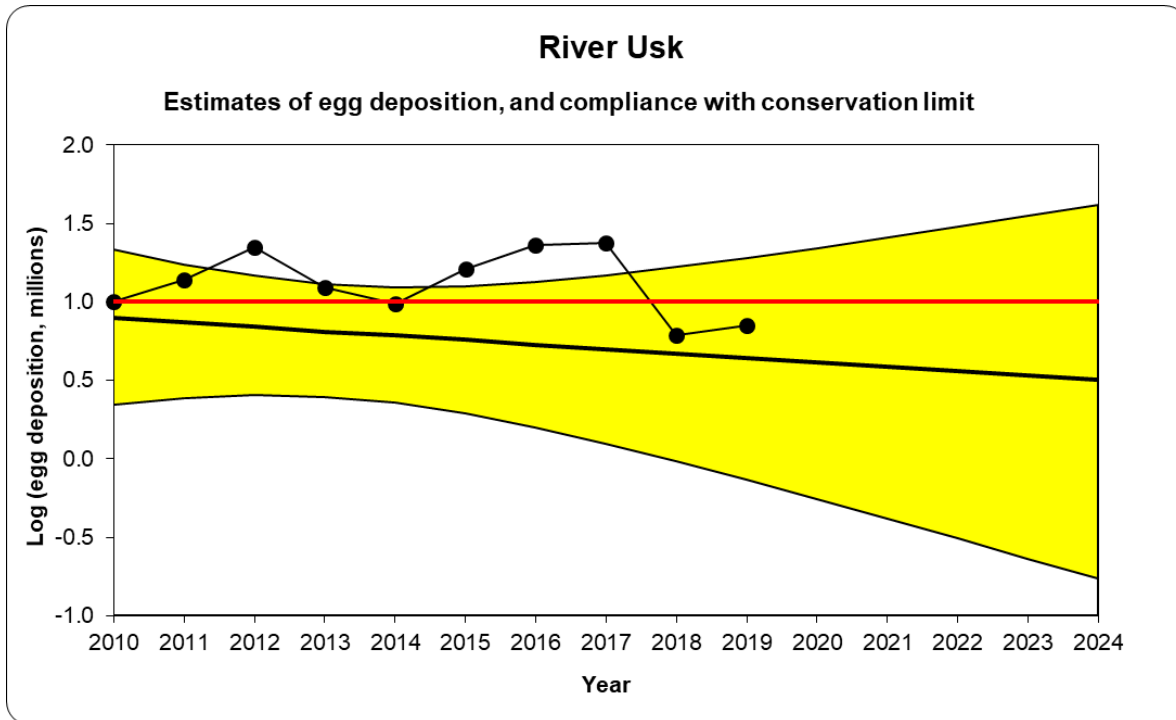


## Stock Status

### Conservation of salmon

Salmon stock status is assessed using 'Conservation Limits' which provide an objective reference point against which to assess the status of salmon stocks in individual rivers.

This is calculated by applying assumed angling exploitation rates to catch data to derive run estimates; adopting standard sex ratios and weight-fecundity relationships to generate egg deposition figures. The numbers of salmon a river can produce (and consequently the catches that the stocks support) are a function of the quality and quantity of accessible spawning and rearing area. Therefore, in general, big rivers have larger catches and have correspondingly bigger total spawning requirements than small rivers. Thus, for any given rivers there should be an optimum level of stock which the CL seeks to protect. The conservation limit represents the number of eggs that must be deposited each year within a given catchment to conserve salmon stocks in the future.



Are enough salmon eggs being deposited to conserve stocks in the catchment?

The red line represents the number of eggs required to be deposited to sustain a healthy salmon stock. The black trend line and its confidence limits (the yellow band) is fitted to the most recent 10-year series of egg deposition estimates (2010-2019).

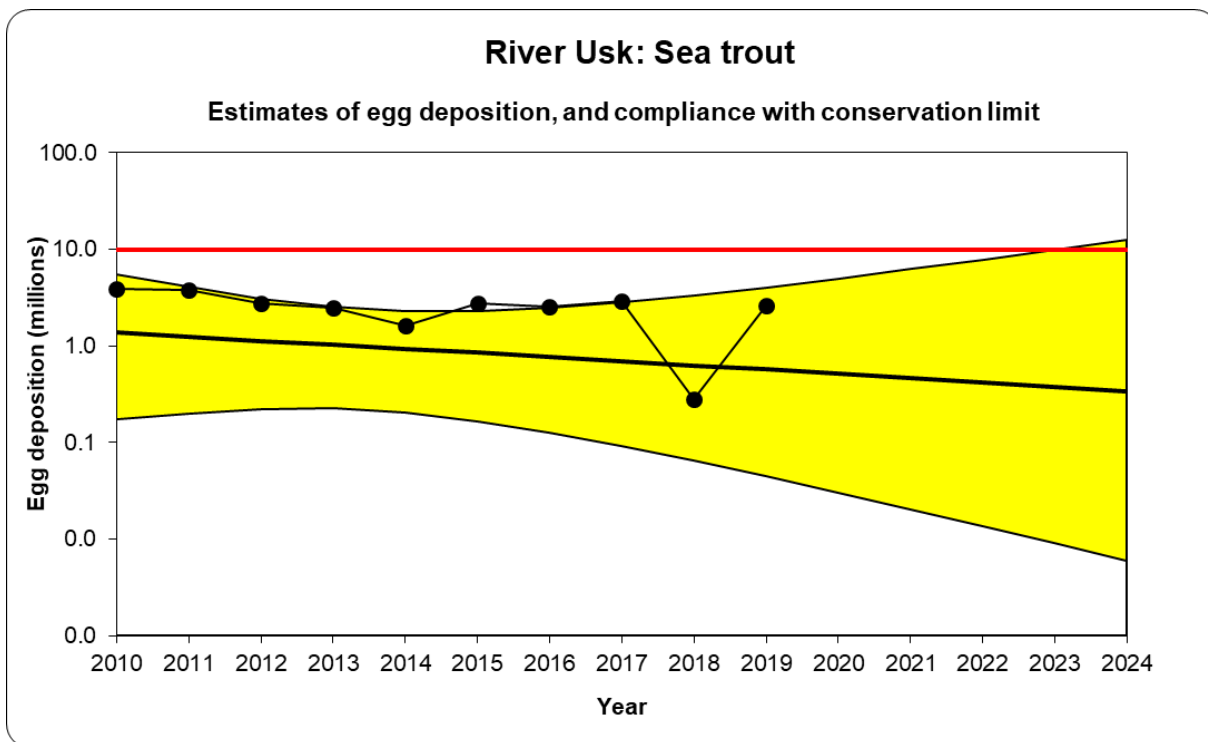
- Current number of eggs being deposited puts stocks as **probably at risk**
- In 5 years' time the predicted status of salmon stocks will be **probably at risk**
- Based on current data, and the projection of the graph, the stocks of salmon on the Usk will continue to **decline (uncertain trend)**

## Conservation of Sea Trout

In contrast to salmon, no established methods of setting Conservation Limits or similar have been available for sea trout. In the absence of such analysis, NRW and the Environment Agency have, for several years, routinely applied a fishery-based assessment to the principal sea trout rivers. This method – used previously in this report - utilises time-series of angling catch per unit effort (CPUE) data ('catch per day') to examine sea trout performance on a river-by-river basis.

Recently an alternative stock-based assessment method has been developed by NRW and is applied here. This utilises angling catch data to derive run and egg deposition estimates for sea trout in much the same way that similar data sets are used in Conservation Limit compliance procedures for salmon assessment.

Further details on this method are given in the recent Technical Case supporting net and rod fishery byelaw proposals on all rivers in Wales and the cross-border rivers Wye and Dee (see: [Technical case for fishing controls to protect salmon and sea trout](#))



Are enough sea trout eggs being deposited to conserve stocks in the catchment?

The red line represents the number of eggs required to be deposited to sustain a healthy sea trout stock. The black trend line and its confidence limits (the yellow band) is fitted to the most recent 10-year series of egg deposition estimates (2010-2019).

- Current number of eggs being deposited puts stocks **at risk**
- In 5 years' time the predicted status of sea trout stocks will be **probably at risk**
- Based on current data, and the projection of the graph, the stocks of sea trout on the Usk will continue to **decline (uncertain trend)**

## Juvenile Salmonid Monitoring Programme

In 2019 we completed the temporal (annual) programme, consisting of 13 sites on the Usk. All sites were surveyed using a semi quantitative (SQ) single run technique. We use the temporal data to look at trends in juvenile salmon and trout densities, and to give an idea of spawning across the whole catchment.

In addition to the temporal programme, we completed a full spatial programme on the Usk catchment as part of the 6-year rolling spatial programme across Wales; this comprised a further 60 semi-quantitative and 18 5-minute riffle sites (Minimum Estimate - ME). This programme is similar in its make-up to the investigative surveys carried out on the Usk in 2017 and 2018 as part of the Wales-wide investigations into the catastrophic failure in salmon recruitment noted in the 2016 data. The spatial results are included in the appendix.

## Salmon and Trout Classifications

The following maps show the results of the juvenile salmonid population survey programme on the Usk in 2019.

The symbols display the National Fish Classification Scheme (NFCS) grades which have been developed to evaluate and compare the results of fish population surveys in a consistent manner. The NFCS ranks survey data by comparing fish abundance at the survey sites with sites across Wales and England where juvenile salmonids are present. Sites are classified into categories A to F, depending on densities of juvenile salmonids at the site. The following table shows the values and classification of NFCS.

| Grade    | Descriptor | Interpretation                               |
|----------|------------|--|
| <b>A</b> | Excellent  | In the top 20% for a fishery of this type    |
| <b>B</b> | Good       | In the top 40% for a fishery of this type    |
| <b>C</b> | Fair       | In the middle 20% for a fishery of this type |
| <b>D</b> | Fair       | In the bottom 40% for a fishery of this type |
| <b>E</b> | Poor       | In the bottom 20% for a fishery of this type |
| <b>F</b> | Fishless   | No fish of this type present                 |

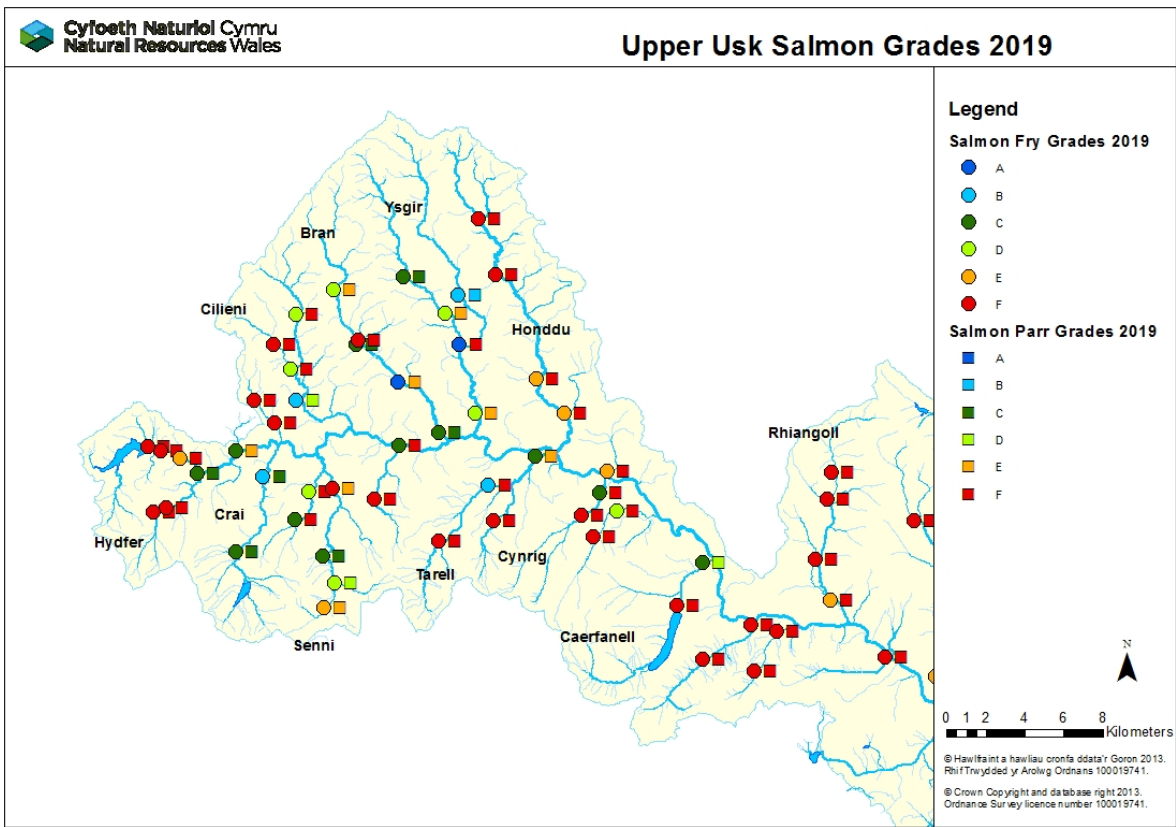


Figure 6 - Map showing the juvenile salmon grades and locations of sampling sites on the upper Usk catchment 2019

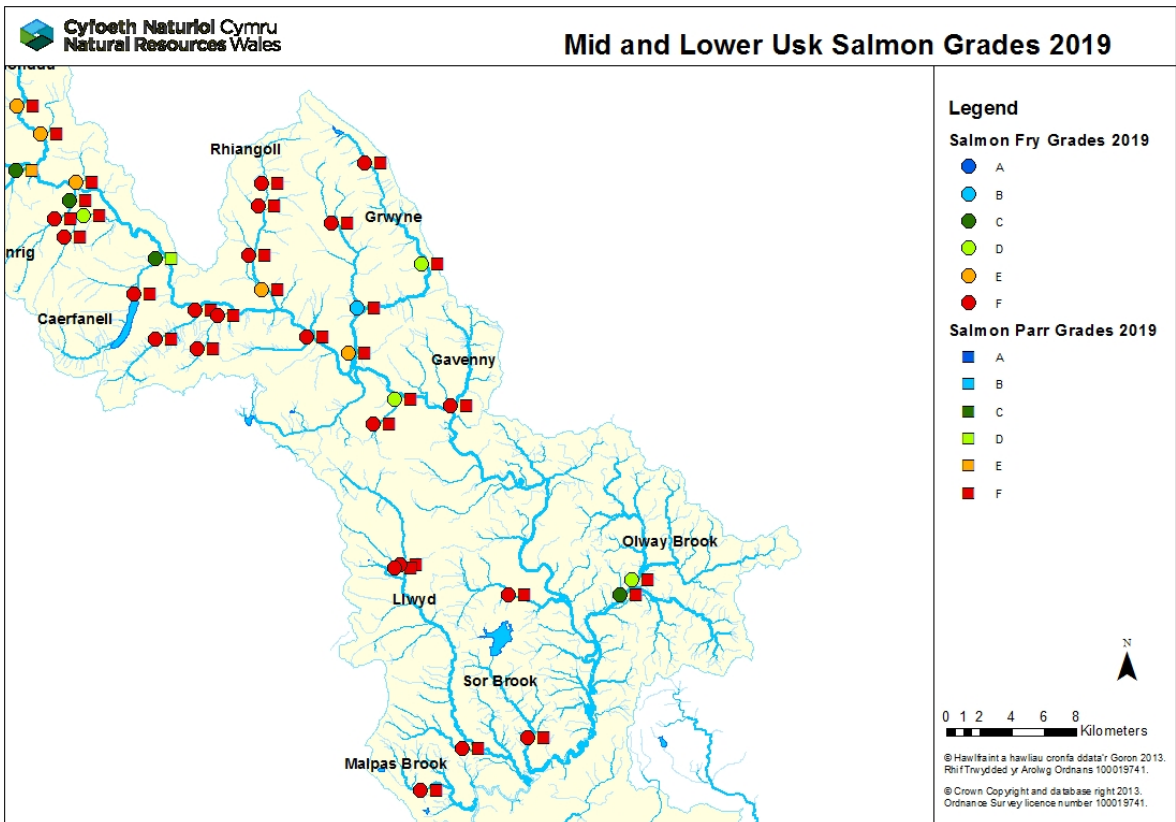




Figure 7 - Map showing the juvenile salmon grades and locations of sampling sites on the mid and lower Usk catchment 2019

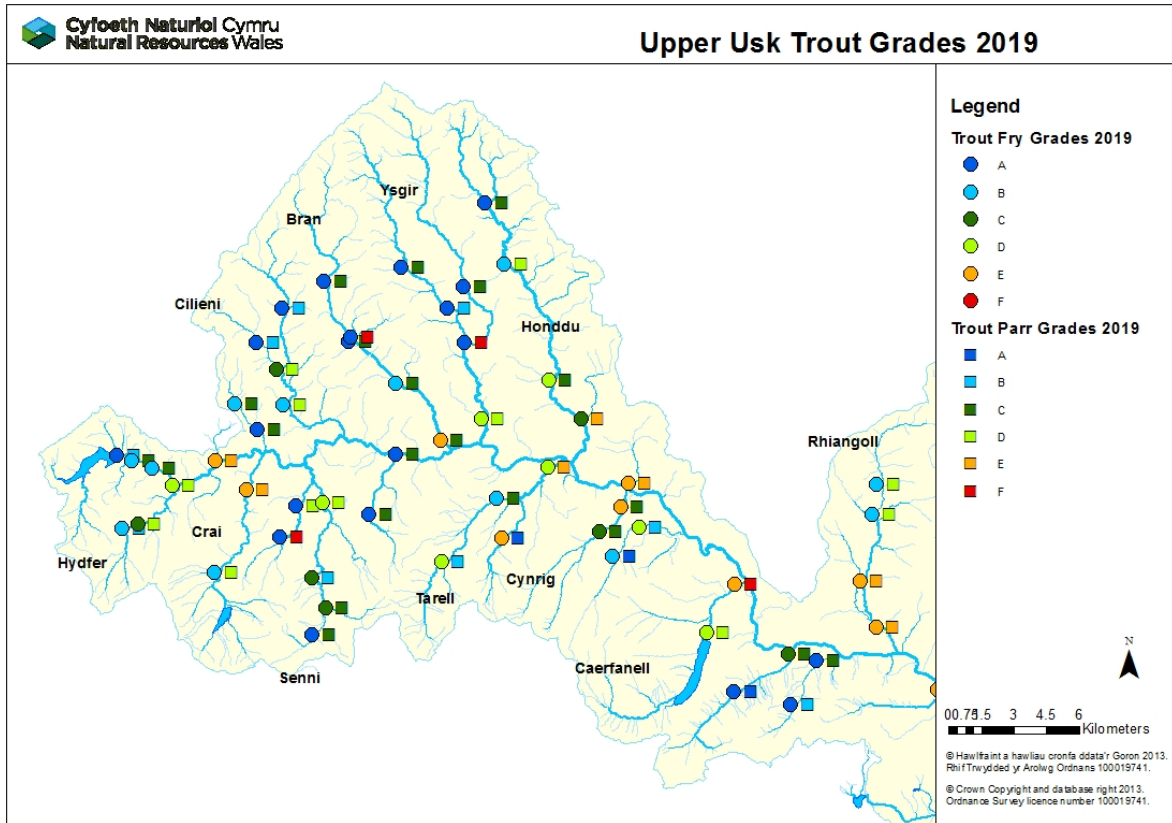


Figure 8 - Map showing the juvenile trout grades and locations of sampling sites on the upper Usk catchment 2019

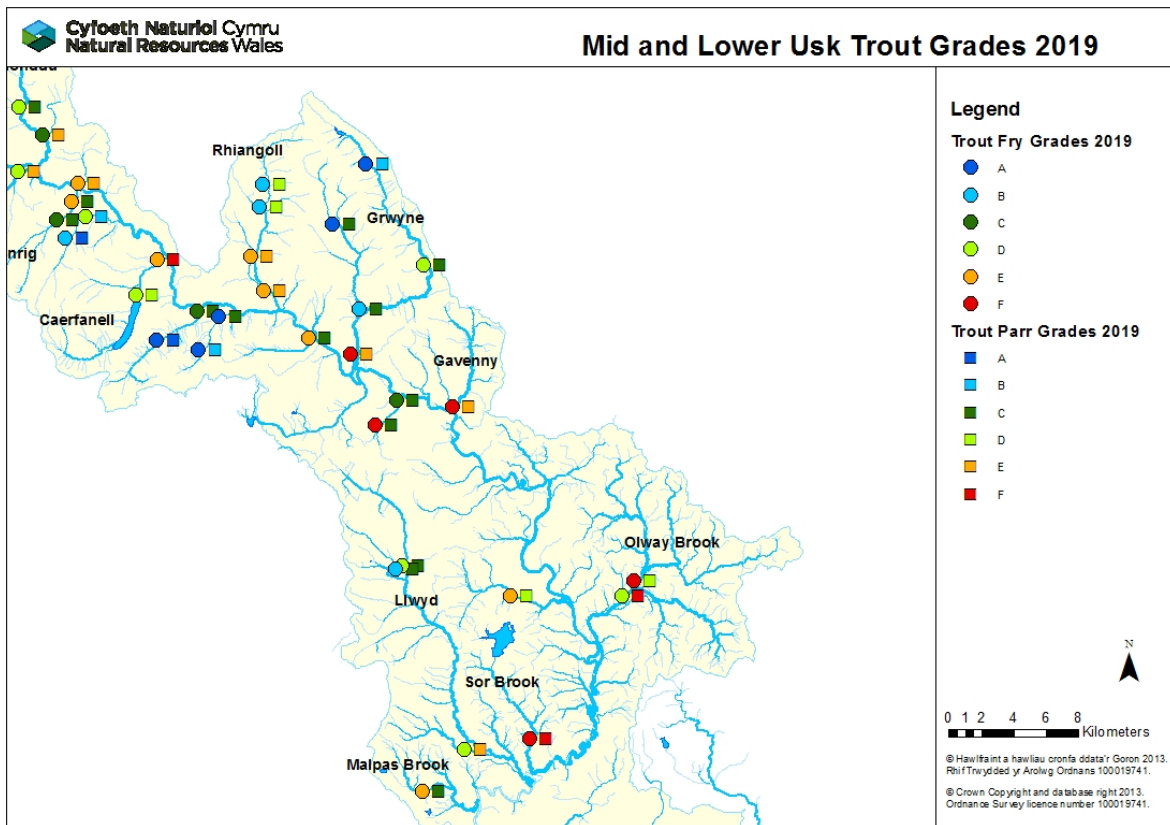


Figure 9 - Map showing the juvenile trout grades and locations of sampling sites on the mid and lower Usk catchment 2019

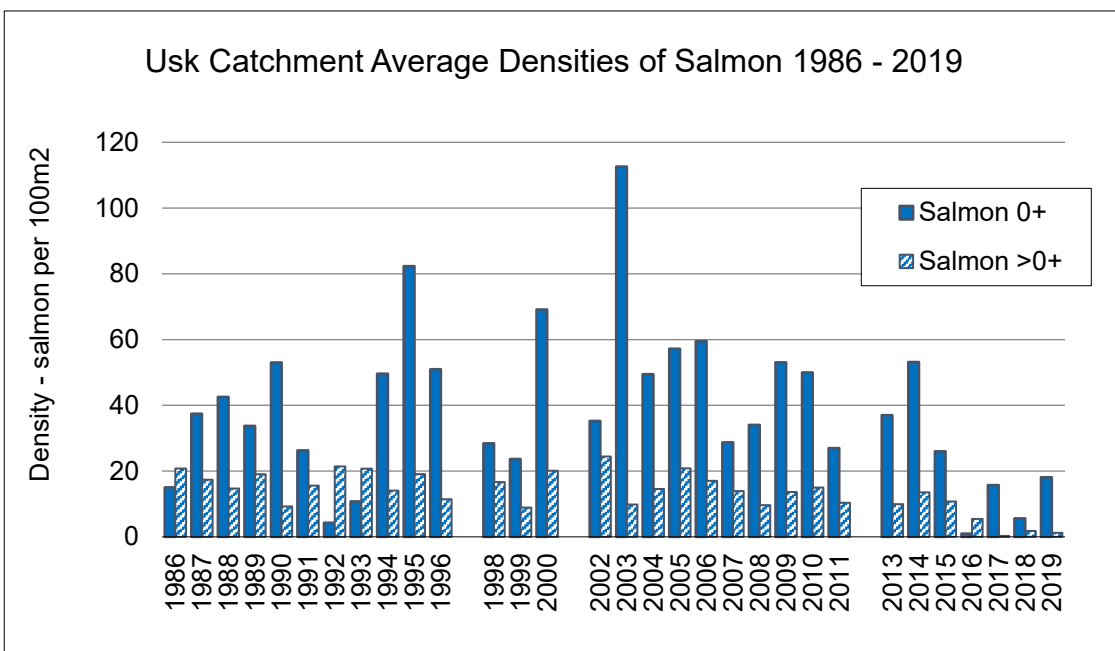
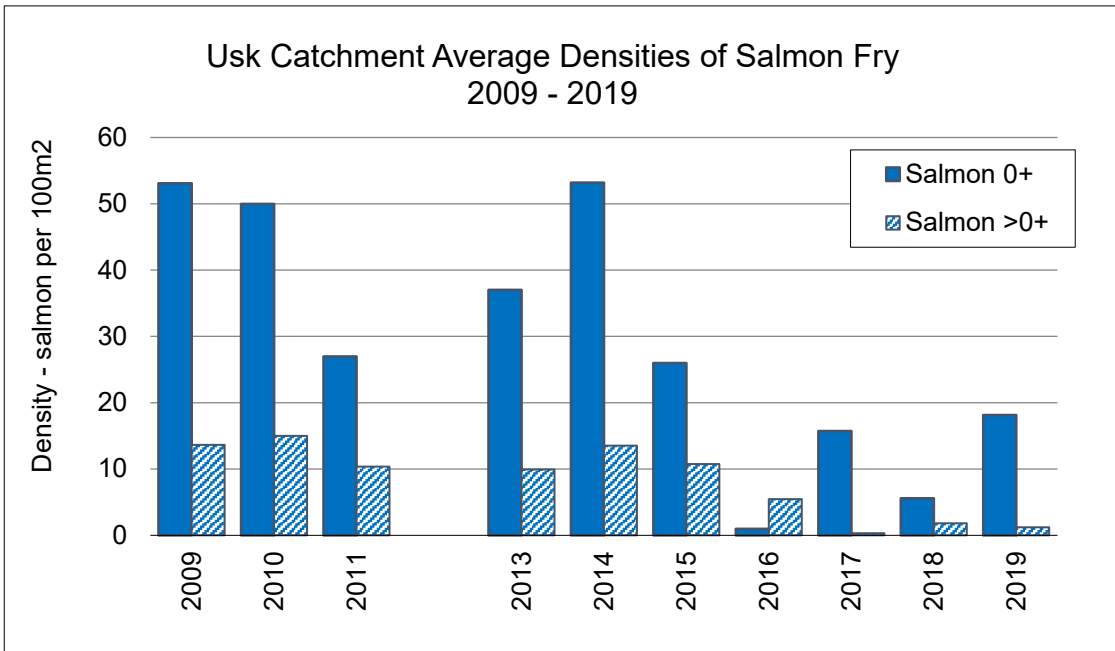
## Juvenile Trend Analysis

The graphs below show a simple comparison of average salmon and trout densities across the Usk catchment since surveying began in 1986. NB – the data shown here are only from the temporal survey programme. Quantitative and semi-quantitative density estimates are included; the former derived using 2 or 3 run catch depletion survey technique and the Carle and Strub calculations, the latter using an NRW derived multiplier for single run surveys.

## Salmon

Statistical analysis shows that up until 2013 there had been an upward trend in salmon fry densities in the Usk catchment since 1986, potentially influenced by spikes in densities in 1995, 2000 and 2003. The data in recent years however shows a decline in salmon fry, this appears to be driven by the poor fry recruitment since 2015; notably an almost total absence in the catchment in 2016.

No trend (up or down) is evident in the salmon parr densities until recently. In line with declines in salmon fry, a decline in parr numbers is evident from about 2016. It is thought that this decline is exacerbated by the main parr tributaries; the Grwyne for example, which all seem to have been hit hardest by poor fry recruitment.

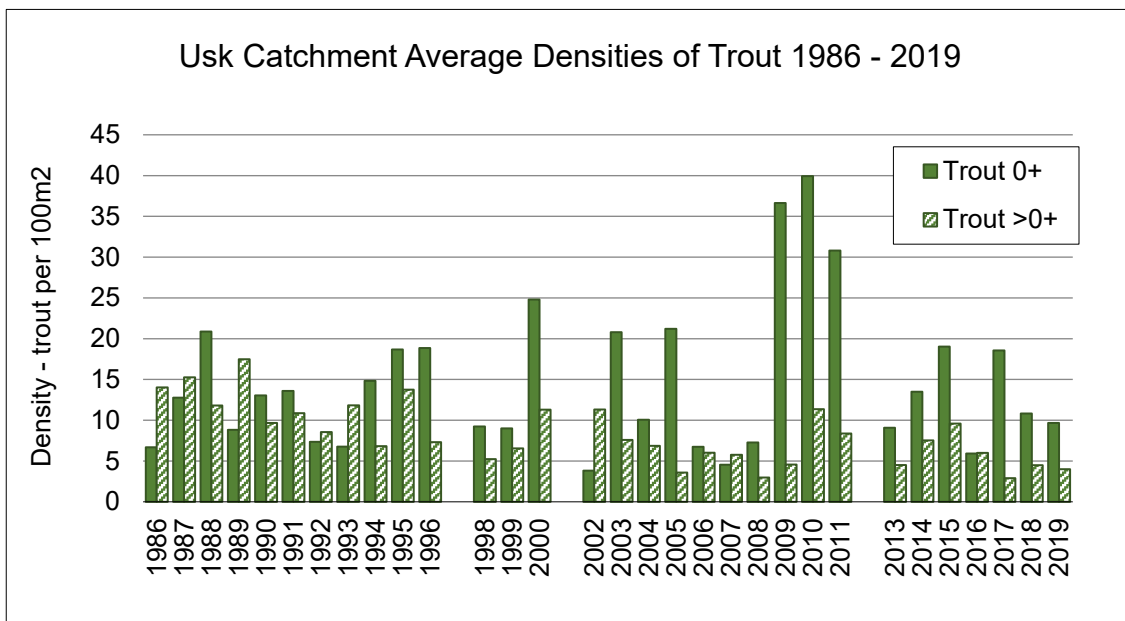
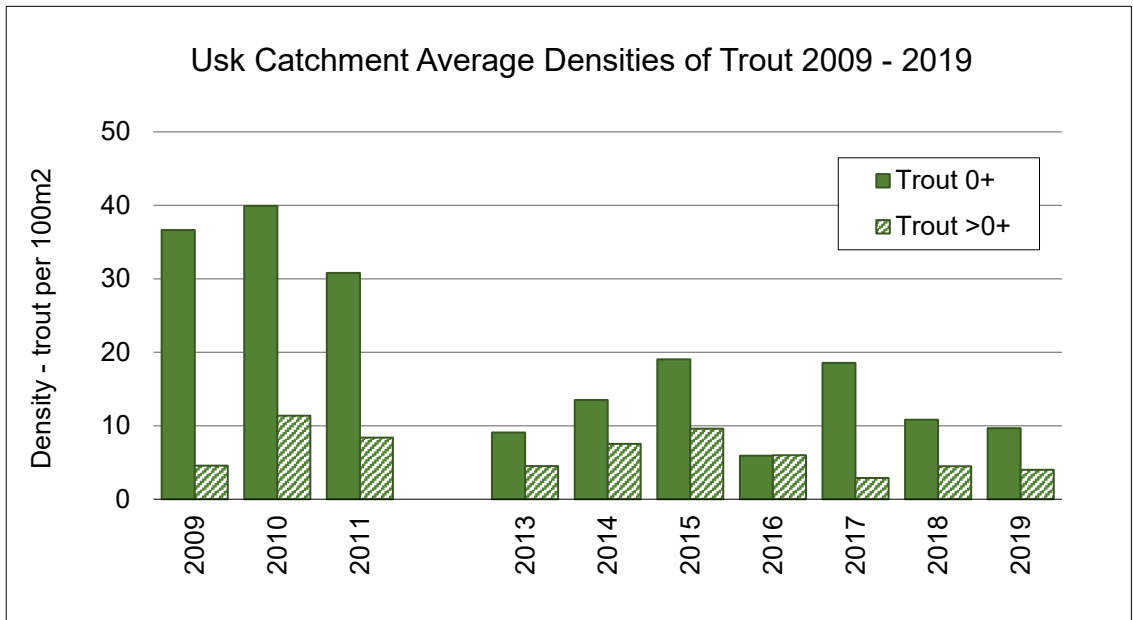


## Brown Trout

The trend in brown trout fry populations in the Usk catchment since 1986 has been generally upwards, probably influenced by the spike in densities recorded 2009 - 2011. Numbers are very variable year to year, and although the poor recruitment seen in salmon in 2016 was also evident in trout – and the corresponding poor year for parr in 2017 – the fry populations do seem to have recovered.

The trend in brown trout parr and adult populations in the Usk catchment since 1986 had been generally downwards, and although it had started to show signs of recovery in recent

years, this was halted in 2016. Whereas fry numbers seem to have recovered, parr and adult numbers have not yet done so on a catchment scale.



## Appendix 1 – survey data and classifications

Salmon and Brown Trout classifications for 2019 Usk temporal and spatial sites.

| River           | Site Code | Survey Type | 0+ Sal Grade | >0+ Sal Grade | Overall Sal Grade | 0+ BT Grade | >0+ BT Grade | Overall BT Grade |
|-----------------|-----------|-------------|--------------|---------------|-------------------|-------------|--------------|------------------|
| Lwyd            | L005      | SQ          | F            | F             | F                 | D           | C            | D                |
| Nant Frwyd      | L007      | SQ          | F            | F             | F                 | B           | C            | C                |
| Nant Dowlais    | L010      | SQ          | F            | F             | F                 | D           | E            | E                |
| Berthin Brook   | U030D     | SQ          | F            | F             | F                 | E           | D            | E                |
| Bran            | U006      | SQ          | A            | E             | B                 | B           | C            | C                |
| Bran            | U006A     | SQ          | C            | C             | C                 | E           | C            | D                |
| Bran            | U019      | SQ          | C            | C             | C                 | A           | C            | A                |
| Bran            | U040G     | SQ          | D            | E             | D                 | A           | C            | A                |
| Cwm Erchan      | U019a     | SQ          | F            | F             | F                 | A           | F            | A                |
| Brecon Brynich  | U088      | SQ          | E            | F             | E                 | E           | E            | E                |
| Caerfanell      | U025      | SQ          | C            | D             | D                 | E           | F            | E                |
| Caerfanell      | U025A     | SQ          | F            | F             | F                 | D           | D            | E                |
| Cwm Camlais     | U081      | SQ          | C            | F             | D                 | A           | C            | B                |
| Camlais Fawr    | U083      | SQ          | F            | F             | F                 | A           | C            | B                |
| Cilieni         | U005      | SQ          | D            | F             | D                 | C           | D            | D                |
| Cilieni         | U005a     | SQ          | B            | D             | C                 | B           | D            | D                |
| Cilieni         | U018      | SQ          | D            | F             | E                 | A           | B            | A                |
| Nant Eithrim    | U058      | SQ          | F            | F             | F                 | A           | B            | A                |
| Crai            | U003      | SQ          | B            | C             | C                 | E           | E            | E                |
| Crai            | U016      | SQ          | C            | C             | C                 | B           | D            | C                |
| Crawnon         | U024      | SQ          | F            | F             | F                 | C           | C            | D                |
| Crawnon         | U024A     | SQ          | F            | F             | F                 | A           | A            | A                |
| Cwm Cleisfer    | U075      | SQ          | F            | F             | F                 | A           | C            | B                |
| Cwm Cleisfer    | U076      | SQ          | F            | F             | F                 | A           | B            | A                |
| Cwm Llanwenarth | U071      | SQ          | D            | F             | E                 | C           | C            | C                |
| Cwm Llanwenarth | U073      | SQ          | F            | F             | F                 | F           | C            | E                |
| Cwm Onnau       | U068      | SQ          | F            | F             | F                 | E           | C            | D                |
| Cynrig          | U040A     | SQ          | C            | F             | D                 | E           | C            | D                |
| Cynrig          | U040B     | SQ          | F            | F             | F                 | C           | C            | C                |
| Dwr Llydan      | U099b     | SQ          | F            | F             | F                 | B           | C            | B                |
| Gavenny         | U029      | SQ          | F            | F             | F                 | F           | E            | E                |
| Grwyne          | U027      | SQ          | E            | F             | E                 | F           | E            | E                |
| Grwyne Fawr     | U012      | SQ          | D            | F             | E                 | D           | C            | D                |
| Grwyne Fawr     | U084      | SQ          | F            | F             | F                 | A           | B            | A                |
| Grwyne Fechan   | U013      | SQ          | B            | F             | D                 | B           | C            | C                |
| Grwyne Fechan   | U116      | SQ          | F            | F             | F                 | A           | C            | A                |
| Honddu          | U009      | SQ          | F            | F             | F                 | B           | D            | C                |

|                |       |    |   |   |   |   |   |   |
|----------------|-------|----|---|---|---|---|---|---|
| Honddu         | U023  | SQ | E | F | E | D | C | D |
| Honddu         | U023a | SQ | F | F | F | A | C | A |
| Honddu         | U023C | SQ | E | F | E | C | E | D |
| Hydfer         | U002  | SQ | C | C | C | D | D | D |
| Hydfer         | U015  | SQ | F | F | F | C | D | D |
| Hydfer         | U105  | SQ | F | F | F | B | B | B |
| Malpas Brook   | U119  | SQ | F | F | F | E | C | D |
| Menasgin       | U010  | SQ | D | F | E | D | B | C |
| Menasgin       | U053  | SQ | F | F | F | B | A | A |
| Nant Clydach   | U104  | SQ | F | F | F | A | C | A |
| Nant Clydach   | U141a | SQ | F | F | F | B | C | B |
| Nant Henwen    | U112  | SQ | F | F | F | A | B | A |
| Olway Brook    | U037  | SQ | C | F | D | D | F | E |
| Olway Brook    | U037C | SQ | D | F | E | F | D | E |
| Rhiangoll      | U011  | SQ | F | F | F | E | E | E |
| Rhiangoll      | U026  | SQ | F | F | F | B | D | C |
| Rhiangoll      | U026a | SQ | E | F | E | E | E | E |
| Rhiangoll      | U130b | SQ | F | F | F | B | D | C |
| Senni          | U004  | SQ | F | E | E | D | D | D |
| Senni          | U017  | SQ | C | C | C | C | B | C |
| Senni          | U017b | SQ | E | E | E | A | C | B |
| Cwm Treweryn   | U017e | SQ | C | F | D | A | F | B |
| Cwm Treweryn   | U017f | SQ | D | F | E | A | D | B |
| Nant Cwm Du    | U017K | SQ | D | D | D | C | C | C |
| Sor Brook      | U031A | SQ | F | F | F | F | F | F |
| Tarell         | U008  | SQ | B | F | C | B | C | C |
| Tarell         | U022  | SQ | C | E | D | D | E | E |
| Tarell         | U022A | SQ | F | F | F | D | B | C |
| Nant Cwm Llwch | U022e | SQ | F | F | F | E | A | C |
| Ysgir          | U007  | SQ | D | E | D | D | D | D |
| Ysgir Fawr     | U020  | SQ | B | B | B | A | C | A |
| Ysgir Fechan   | U007a | SQ | A | F | A | A | F | B |
| Ysgir Fechan   | U021  | SQ | D | E | D | A | B | A |
| Ysgir Fechan   | U021a | SQ | C | C | C | A | C | A |
| Usk            | U001  | SQ | E | F | E | B | C | C |
| Usk            | U014  | SQ | C | E | D | E | E | E |

## Appendix 2 – fisheries actions

Within the Salmon and sea trout plan of action for Wales 2020, there are listed a plan of actions.

The Plan includes:

1. Evidence
2. Managing exploitation
3. Protecting stocks through effective enforcement
4. Tackling physical habitat constraints in the freshwater environment
5. Safeguarding water quality and quantity
6. Addressing land management, and associated risks to water quality
7. Addressing predation on salmonids: fish-eating birds and seals
8. Understanding marine pressures
9. Understanding new and emerging potential pressures

### Fisheries action table, Usk specific

| Site | Planned actions   | Benefits   | Lead          | Partner(s)                            | Timescale for delivery |
|------|---|--|---------------|---------------------------------------|------------------------|
| Usk  | NRW has awarded funding for 12 projects across the Usk catchment. Including habitat improvement, barrier removal and easements and gravel replenishments. | Improved access to migratory fish, improved habitat for spawning and juvenile life stages. | NRW as funder | River trust delivery of the projects. | 2020/21                |
| Usk  | In the spring of 2021 NRW are leading a smolt tracking study. Tracking the smolts through the freshwater Usk. First of a three to four year project.      | Purpose to determine loss, reason, location and mitigation.                                | NRW           | WUF                                   | 2021-2024              |

|     |   |   |     |                |         |
|-----|---|---|-----|----------------|---------|
| Usk | River Usk fisheries byelaw review. The provision within the Wales national byelaws for the river Usk was three years, a reappraisal of the fishery byelaws is now due. To be completed December 2021. | Maintain appropriate fishery measures to sustain the fishery into the future. | NRW | All consultees | 2020/21 |
|-----|---|---|-----|----------------|---------|