Know Your River Report, Wye 2019

Salmon and sea trout catchment summary

Introduction

This report describes the status of the salmon and sea trout populations in the Wye 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 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 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 Wye rises from an altitude of 741m in the Welsh mountains at Plynlimon and at 250km in length it is the 6th largest river in the UK. The principal tributaries are the Elan, Ithon, Irfon, Lugg and Arrow, and the Monnow. The Lugg and Arrow rise in Wales and then flow east through England before joining the Wye at Hereford, in addition significant parts of the Monnow catchment and main river Wye also lie within England.

Land-use in the catchment is predominantly agriculture (with some woodland and residential areas). Higher grounds and poorer soils to the north and west supporting largely monoculture conifer forestry and pastoral farming, give way to higher quality and more intensive arable agriculture in the south and east of the catchment. In the upper catchment the headwaters of the Elan River are impounded, creating the Elan Valley system of reservoirs.

The Wye catchment is one of great ecological value. It has many SSSIs and the main river and many of its tributaries are designated as a riverine SAC under the Habitats Directive for ten 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.

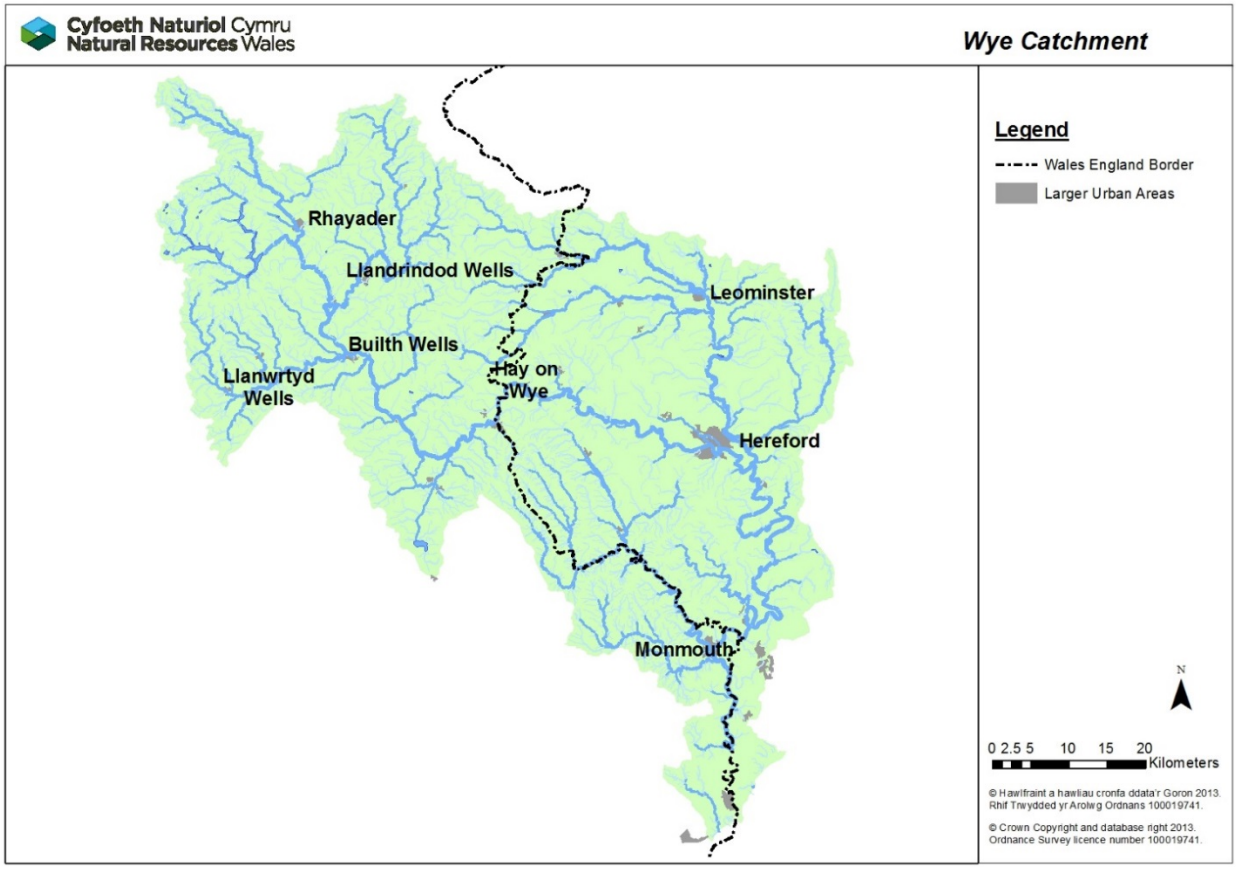


Figure 1 - Map showing the River Wye catchment with urban areas

The River Wye is a well-established and nationally significant salmon rod fishery with the most recent reported rod catch (2019) of 348. Salmon are found throughout the Wye catchment except in the upper reaches of the Elan, above the reservoirs. Fish passes installed at numerous weirs across the Lugg and Arrow, and at Osbaston on the Monnow have opened these catchments and have resulted in the inclusion of these catchments in the Salmon Conservation Targets. The Wye catchment has suffered from declining rod catches, and after some years of promoting voluntary catch and release, a Wye specific byelaw was introduced in June 2012 which mandated the release of all rod caught salmon.

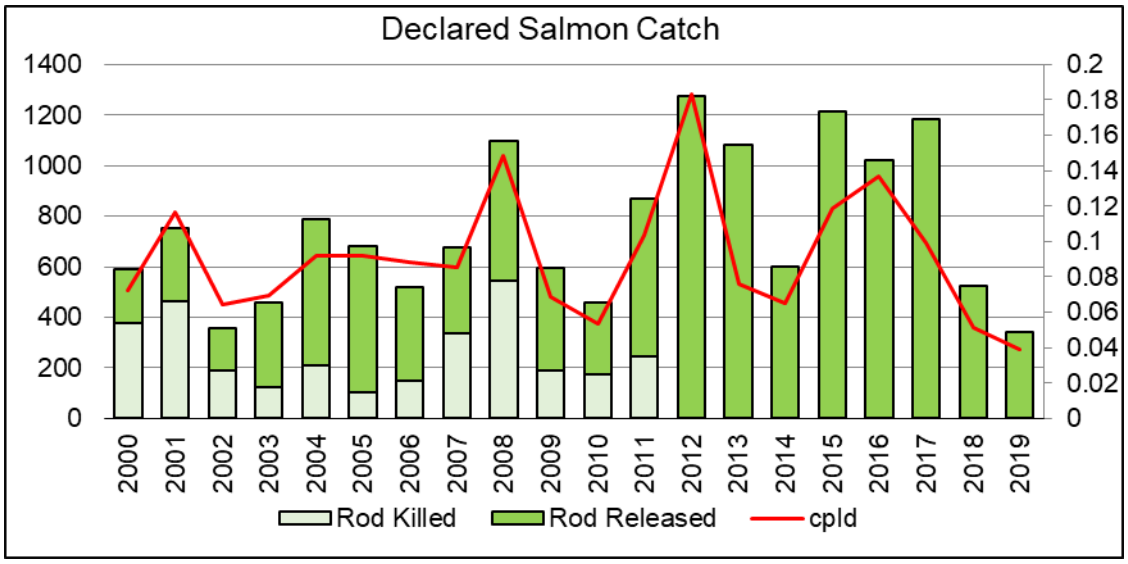
A small number of sea trout are caught on the Wye (46 fish in 2019). Similar to the neighbouring river Usk the Wye is not known for sea trout and has never had a significant rod catch.

The River Wye and its tributaries are also a locally important brown trout, coarse fish and grayling fishery. Elver fishing takes place within the tidal reaches of the Wye.

Rod Catches

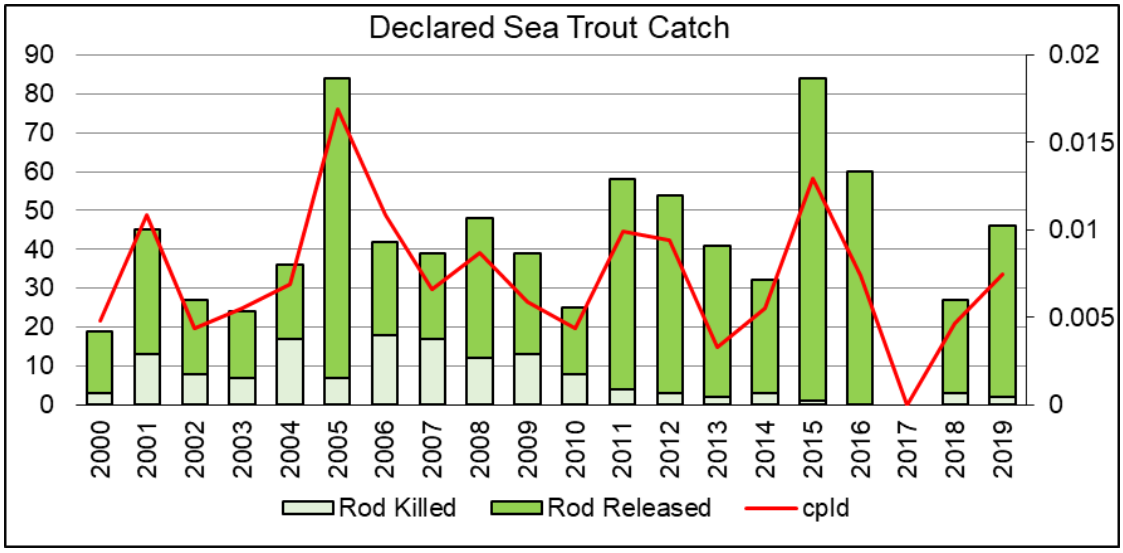
The following graphs show the total declared rod catches of salmon and sea trout on the Wye and Catch Per License Day. CPLD is an estimate of the average catch per fishing day on a catchment.

Salmon Rod Catch - Since 2012 rod catches had been stabilising and prospects were looking good for Wye salmon. Unfortunately, like many Atlantic salmon river stock, in 2018 the catch collapsed, in 2019 the catch further declined.



Sea Trout Rod Catch – Many rivers across Wales have seen declines in sea trout catches, this trend is not reflected in the Wye catch, the catch has consistently been low and remains so.

The Wye does not have a sea trout fishery, little or no targeted sea trout fishing occurs. This small catch is likely due to the few sea trout that enter the Wye rather than the lack of targeted angling effort. The Wye along with the nearby Usk and Severn, all draining to the Severn Estuary, have no history of supporting large sea trout fisheries. The main salmonid angling focus is salmon, and brown trout in the upper reaches and larger tributaries.



Net Catches

There are now no net fisheries operating within the river Wye.

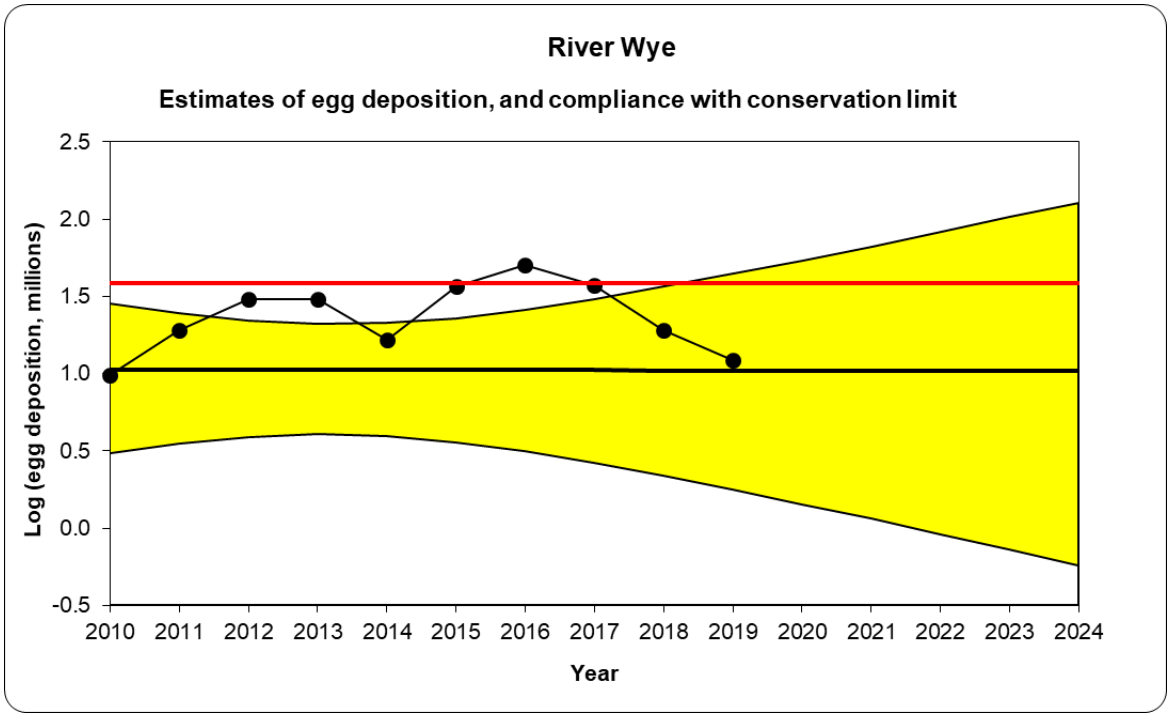
There is one Heritage Lave net fishery operating in the Severn Estuary adjacent to the mouth of the river Wye. In 2019, following a Habitats Directive Regulation Assessment (HRA), this fishery was not allocated licences to kill salmon for the 2020 season.

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).

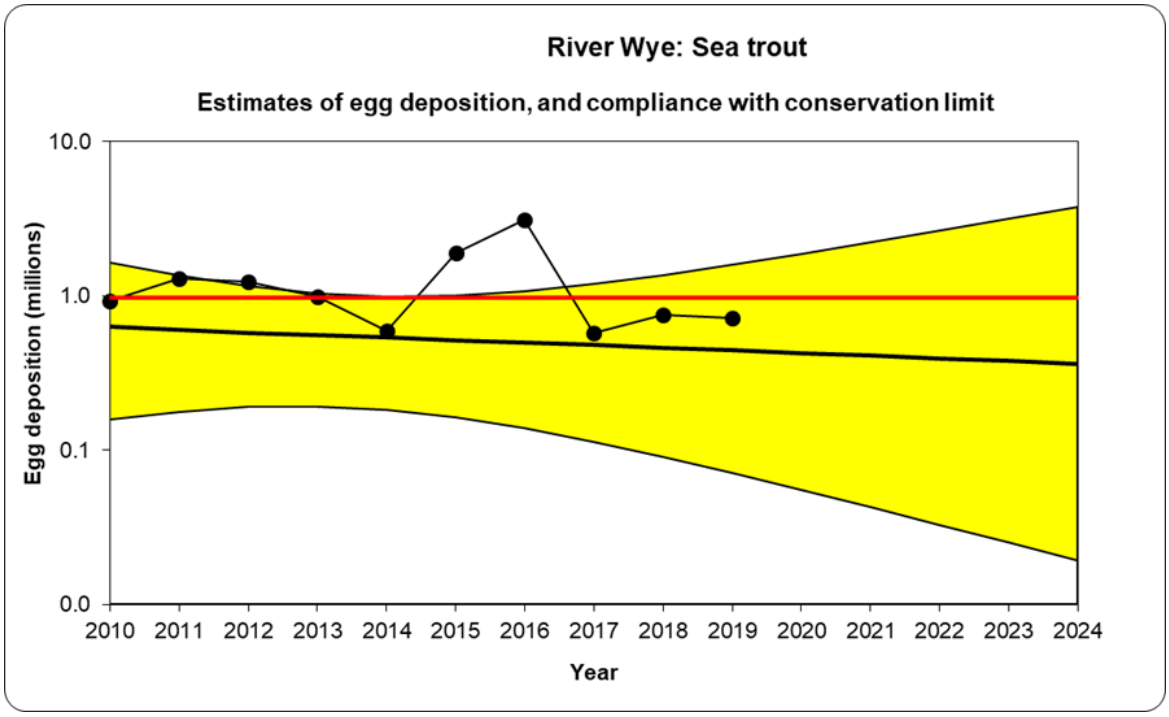
- Current number of eggs being deposited puts stocks as **probably at risk**
- In 5 years' time the predicted status of salmon stocks will be **probably at risk**
- Based on current data, and the projection of the graph, the stocks of salmon on the Wye will continue to **decline (uncertain trend)**

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 **probably 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 Wye will continue to **decline (uncertain trend)**

Juvenile Salmonid Monitoring Programme

In 2019 the temporal (annual) survey programme consisted of 24 sites in Wales. All the 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.

The surveying programme (and responsibility for the catchment) is split between Natural Resources Wales (NRW), who are responsible for the Welsh Wye, and the Environment Agency on the English side.

Salmon and Trout Classifications

The following maps show the results of the routine juvenile salmonid population survey programme on the Wye 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
A	Excellent	In the top 20% for a fishery of this type
B	Good	In the top 40% for a fishery of this type
C	Fair	In the middle 20% for a fishery of this type
D	Fair	In the bottom 40% for a fishery of this type
E	Poor	In the bottom 20% for a fishery of this type
F	Fishless	No fish of this type present

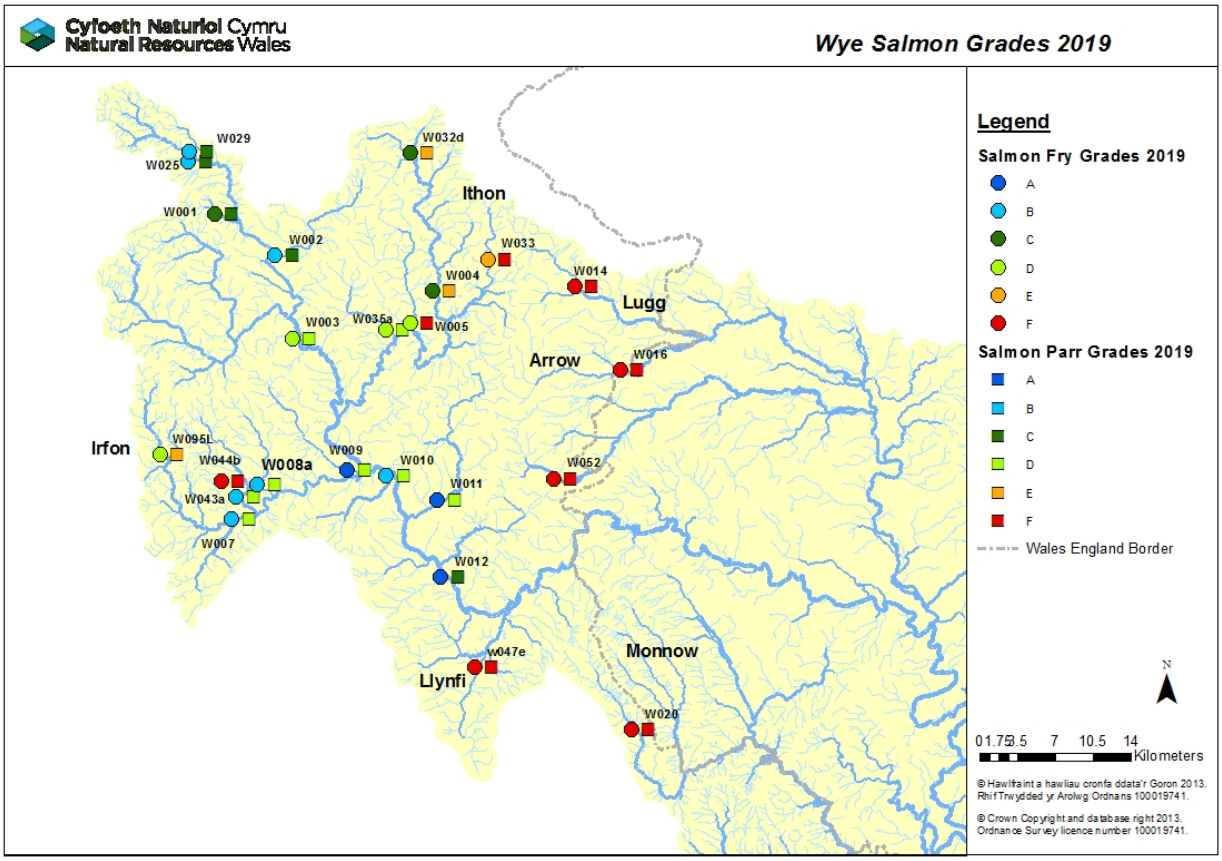


Figure 6 - Map showing the juvenile salmon grades and locations of sampling sites on the Wye catchment 2019.

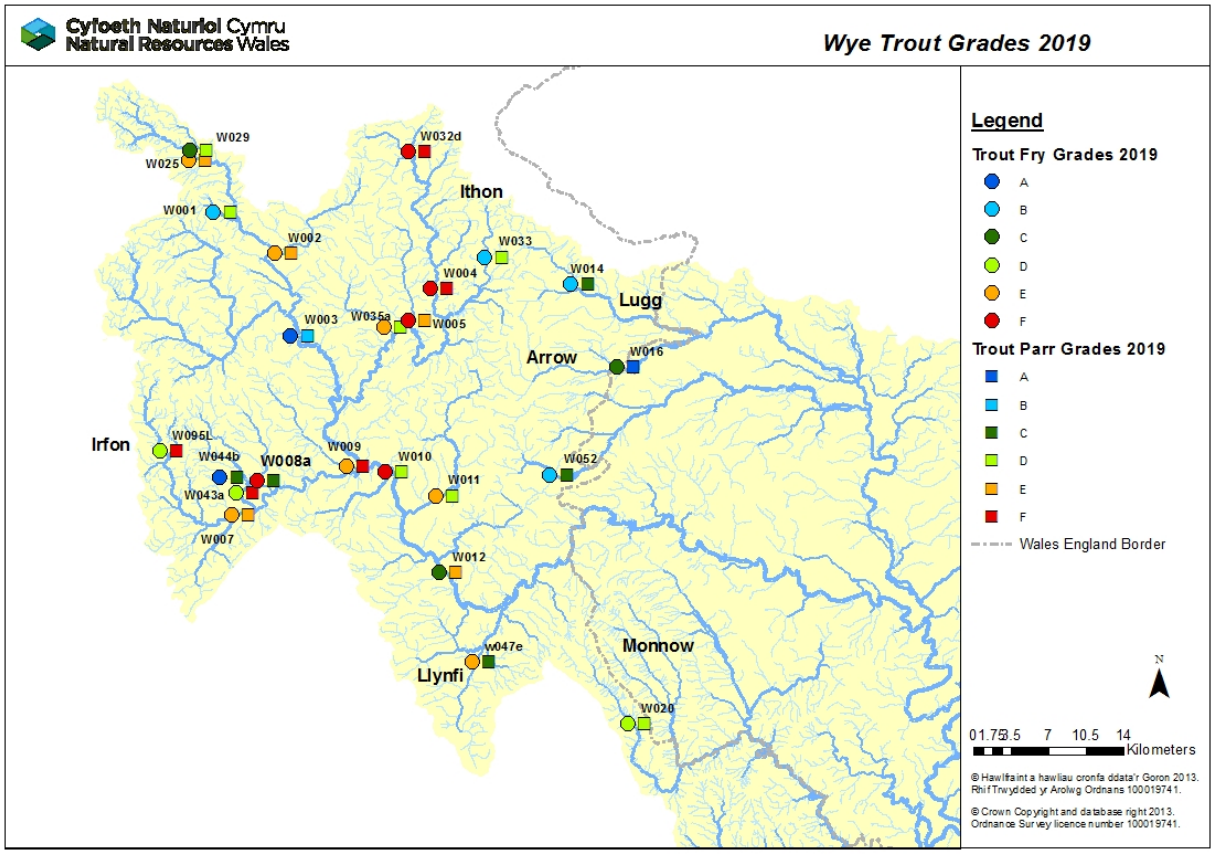


Figure 7 - Map showing the juvenile trout grades and locations of sampling sites on the Wye catchment 2019.

Juvenile Trend Analysis

The graphs below show a simple comparison of average salmon and trout densities across the Wye catchment; since surveying began in 1985 and focussed on the last ten years.

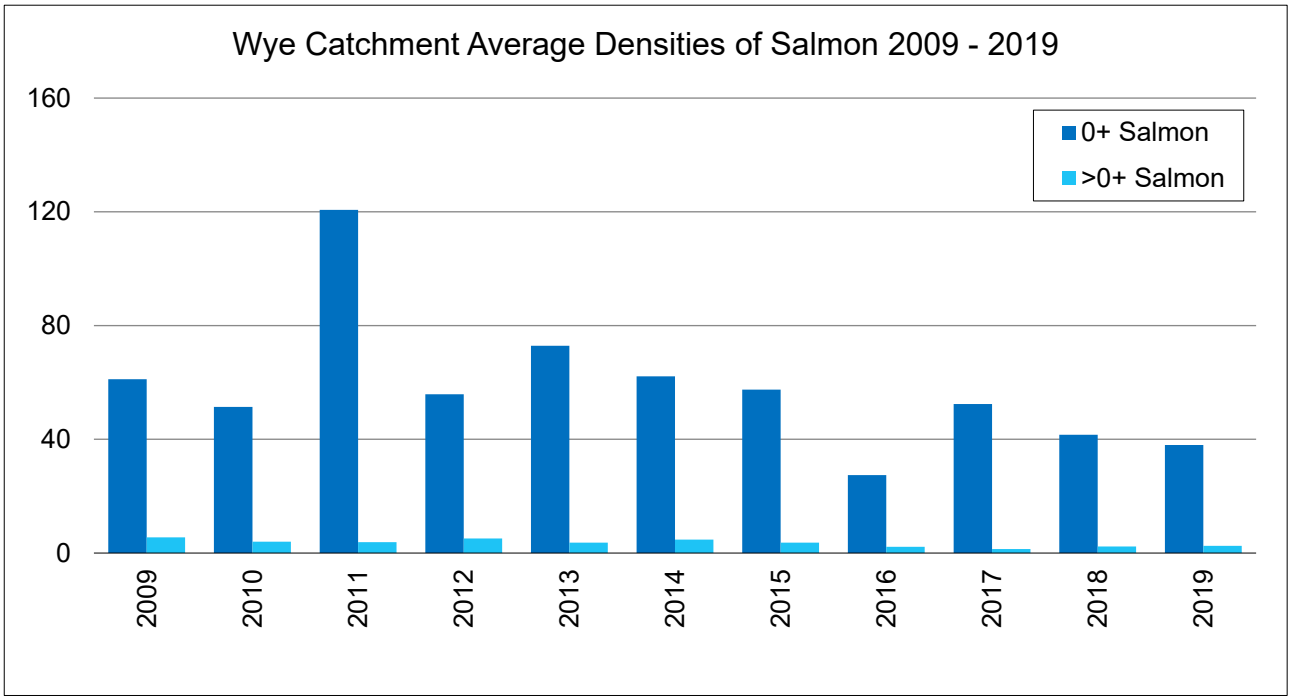
NB – the data shown here are only sites in the current Welsh monitoring programme; not every site in the programme was done every year; no surveys were done in 1996 or 2001, and only the Irfon catchment was surveyed in 2011. Quantitative and semi-quantitative density estimates are included in these trends and the catchment averages; 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. This means that the graphs, and the catchment averages below will differ to those presented in previous reports.

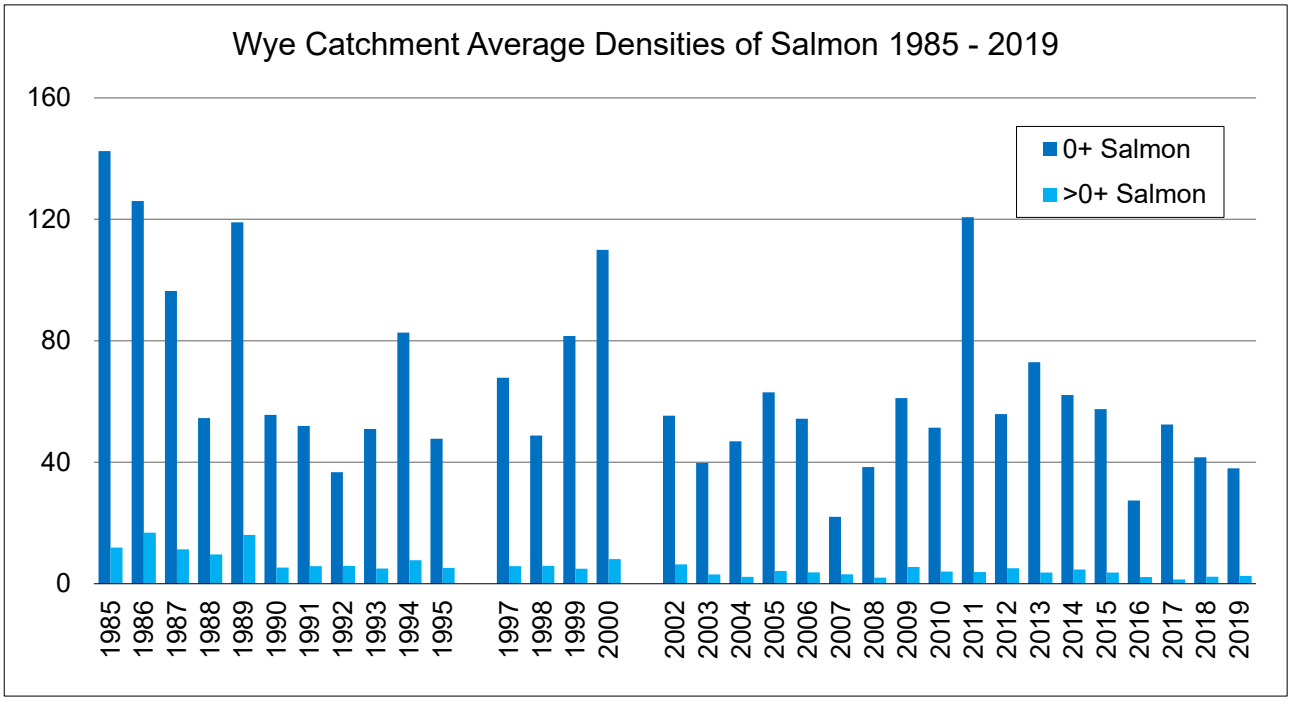
Salmon

Recent years have seen a decline in densities, possibly in river survival related, although the 2019 survey results for salmon fry (0+) were only marginally less than last year. However, densities for salmon fry for the last 8 years have been less than half of what they were in 2011 (120 per hundred metres squared).

The sites within our temporal monitoring programme include stretches of river which are still inaccessible, and no salmon numbers were recorded at these sites. These zeros generally driving down the averages displayed in the graphs below. Remaining rivers impacted by barriers where no salmon were recorded include the Lugg, Arrow, Hindwell Brook, Honddu (Monnow tributary), Einon and the Llynfi.

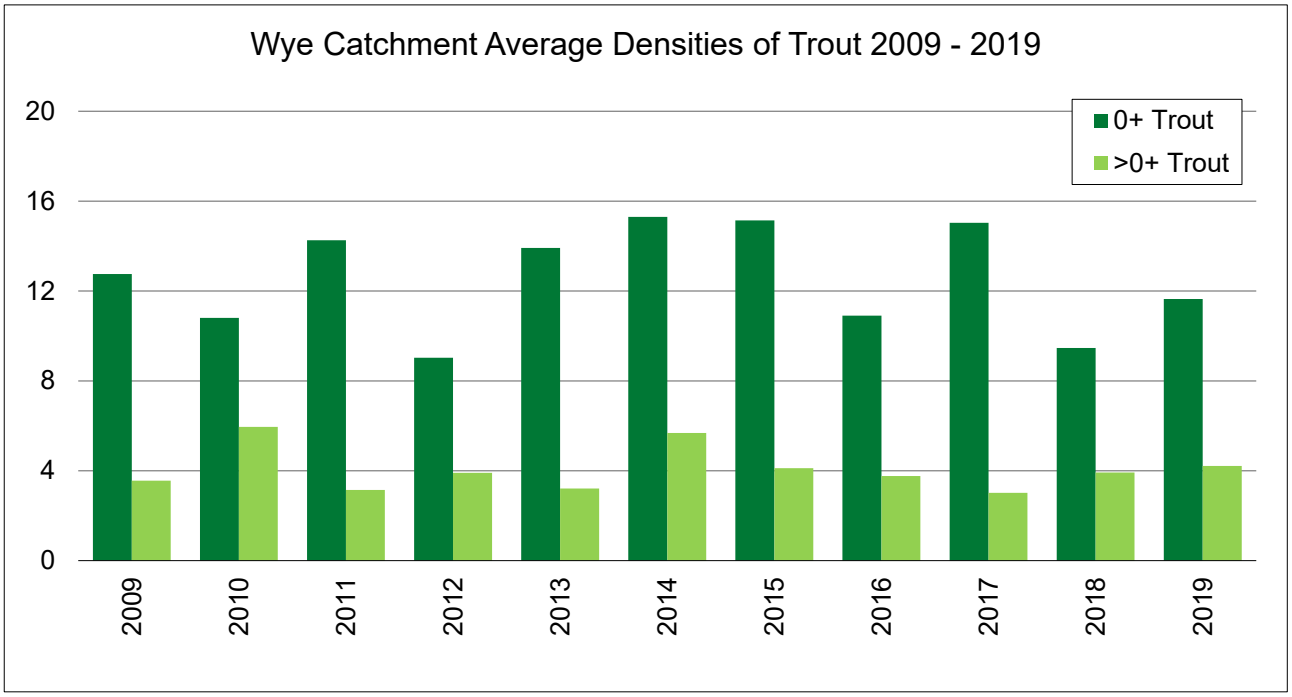
Salmon parr are not faring well either at our survey sites. These sites were originally selected as sites to assess spawning, so parr numbers might normally be relatively low if the habitat favours 0+ fishes. Seven sites had no salmon parr present at all.





Brown Trout

From the graphs below it can be seen that the trout densities appear stable. This may be a reflection of the status of the trout (it clearly is at these sites) but over the whole catchment it perhaps does not give a good picture, these densities while stable are low. A more targeted assessment of habitat suitability and densities may give a better ‘health status’ of the wye trout. We will hopefully get a better picture with our next spatial survey which is planned for 2020.


Wye Catchment Average Densities of Trout 2009 - 2019
0+ Trout
>0+ Trout
20
16
12
8
4
0
2009
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2014
2015
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2018
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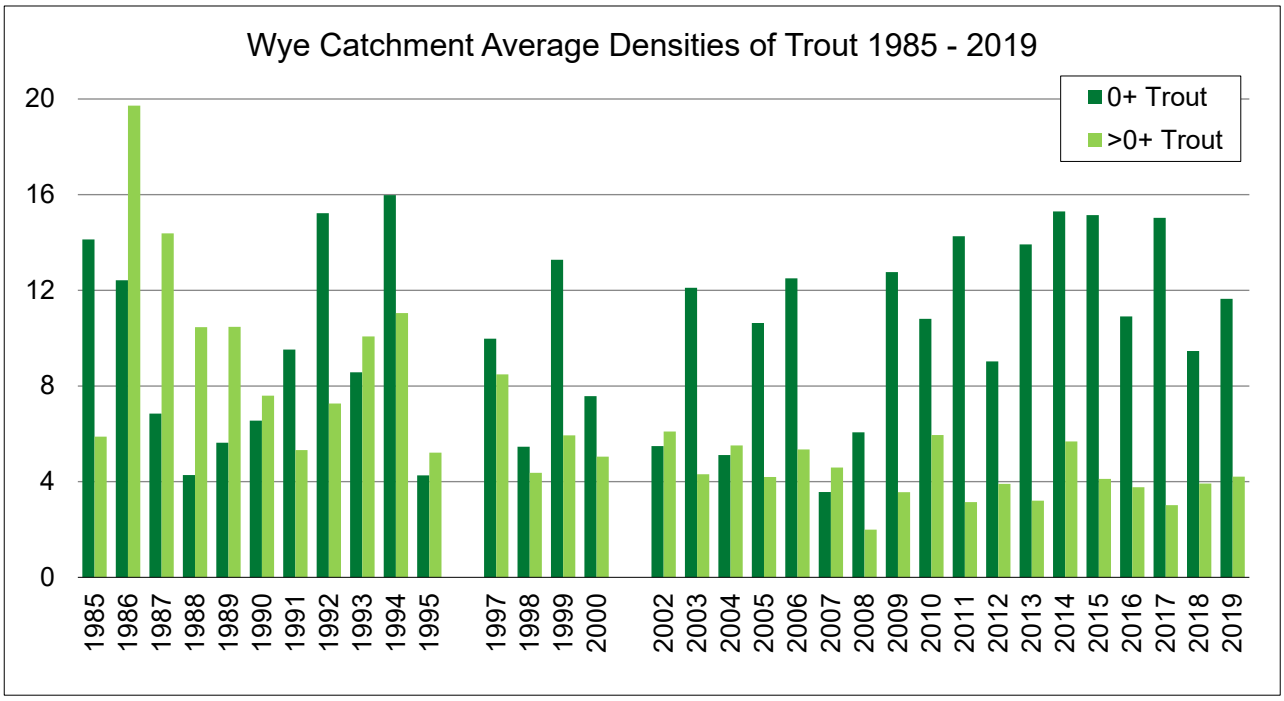
Wye Catchment Average Densities of Trout 1985 - 2019
0+ Trout
>0+ Trout
20
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1988
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Appendix 1 – Fisheries actions

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, Wye (in Wales) specific

Site	Planned actions	Benefits	Lead	Partner(s)	Timescale for delivery
Wye	NRW has awarded funding for 12 projects across the Wye catchment. Including habitat improvement, barrier removal and easements.	Improved access to migratory fish, improved habitat for spawning and juvenile life stages.	NRW as funder	River trust delivery of the projects.	2020/21
Wye	Fisheries Habitat Restoration Plan	Identify actions for improvement	NRW	River trust delivery of the projects.	2021

Wye	Liming upper Wye & Irfon	Buffering of pH to mitigate acid run off.	NRW/River Trust	River trust delivery of the projects.	Complete May 2020 250 tonnes distributed to 96 sites. 250 tonnes extra purchased and delivered for 2021 liming operation.
Wye	Elan Gravel replenishment	Mitigate for reservoir impact upon sediment transportation. Provides spawning and nursery habitat for fishes.	NRW/DCWW	River trust delivery of the projects.	2020/21
Wye	River Wye fisheries byelaw review. The existing byelaw runs out after the 2021 season, 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	2020/2021