

In 2016 we completed the temporal salmonid survey programme, consisting of 24 sites in Wales (annual). The Environment Agency completed a further 4 of the 8 Wye sites in England (2 yearly). We use the Welsh temporal data to look at trends in juvenile salmon and trout densities, and combine our data with the English data to give an idea of spawning across the whole catchment. The surveying programme (and responsibility for the river) is split between Natural Resources Wales, who are responsible for the Welsh Wye, and the Environment Agency on the English side.

#### Key Points

Juvenile salmon densities across Wales in 2016 have been poor, with some catchments showing significant absences of salmon fry. The Wye catchment has not seen these unexpected absences, but the average density in the catchment for both fry and parr is less than expected; roughly half when compared to 2015 and the 5 year catchment average; the lowest for fry since 2007 and the second lowest in survey history. This decline is seen across the whole catchment at all but two sites (Dernol W001 and Ithon W032d).

We recorded juvenile salmon at 19 of 28 Wye sites in 2016; the exceptions being the sites on the Monnow, Lugg and Arrow catchments. Salmon were also absent from the Llynfi and Einon sites, both of which have always had low and variable numbers of salmon and so an absence is not unusual.

Just one of the 28 sites had a salmon fry classification of Excellent (A) and four Good (B), and salmon parr classifications were lower again with none Excellent and just one Good.

We recorded juvenile brown trout at 26 of 28 Wye sites in 2016; the exceptions being the sites on the Ithon at Dol y Dre and the Clywedog, both of which have only ever recorded inconsistent and very low numbers of trout.

Just five of the 28 sites had trout fry classifications of Excellent (A) or Good (B). Again, only five sites had trout parr and adult (>0+) classifications of Excellent (A) or Good (B) – all of these were on the Lugg and Arrow catchments.

#### Salmon and Trout Classifications

The following maps show the results of the routine juvenile salmonid population surveys from 2016 in Wales and England (raw data are given in the Appendix). Also shown are the classification maps for the salmonid temporal programme in 2015, for comparison.

www.environment-agency.gov.uk



Environment Agency Juvenile Salmonid Summary River Wye 2016





Page | 2



Environment Agency Juvenile Salmonid Summary River Wye 2016





www.cyfoethnaturiolcymru.gov.uk www.naturalresourceswales.gov.uk www.environment-agency.gov.uk



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
А	Excellent	In the top 20% for a fishery of this type
В	Good	In the top 40% for a fishery of this type
С	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

### **Catchment Population Trends**

The graphs below show a simple comparison of average salmon and trout densities across the Wye catchment since surveying began in 1985. NB – the data shown here are only from fully quantitative surveys of sites in the current Welsh monitoring programme; this traditionally focussed on good salmon spawning habitat and the Lugg, Arrow and Monnow were only included from 1987. Not every site in the programme was done every year, and no surveys were done in 1995, 1996 or 2001, and only the Irfon catchment was surveyed in 2011.

Salmon fry and parr densities have shown a statistically significant decline over this time, in line with rod catches. However, analysis of the data from 2002 onwards – the date when the current survey programme was set and has remained largely consistent – showed an increasing trend up until, and including 2015. This upward trend has completely halted with the inclusion of 2016 survey data.

Brown trout densities in the Wye catchment have shown a contrasting picture since 1985, with fry densities remaining relatively stable but parr and adult (>0+) densities declining. It should be noted that adult densities are always low and variable in these surveys, which are targeting juvenile populations. Analysis of the data since 2001 suggests a more hopeful picture, with the trout fry trend continuing upwards and the parr and adult (>0+) trend shifting to be less strongly downwards. Unlike the salmon densities, inclusion of the 2016 has done nothing to alter this trend.





**Juvenile Salmonid Summary** 

**River Wye 2016** 



www.cyfoethnaturiolcymru.gov.uk www.naturalresourceswales.gov.uk





The following table shows a simple comparison of the catchment average density of juvenile salmon and trout from 2016, and compares this to 2015 and a 5-year average. NB – these densities are calculated from the first run of all quantitative surveys and any semiquantitative surveys of sites within the monitoring programme, and as such, numbers are not directly comparable to those given in the graphs above which are based on fully quantitative estimates only.

	0+ Salmon	>0+ Salmon	0+ Trout	>0+ Trout
2016 average density (per 100m <sup>2</sup> )	16.6	1.4	8.1	3.1
2015 average density (per 100m <sup>2</sup> )	27.8	2.5	10.5	3.4
Percentage difference to 2015	-40%	-47%	-24%	-8%
5-yr average density (per 100m <sup>2</sup> )	32.1	2.8	7.8	3.2
Percentage difference to 5yr average	-48%	-51%	4%	-1%

When compared to both the results from 2015 and the 5 year average, the 2016 catchment density for salmon fry and parr is approximately half, this is also reflected in the trend analysis. The decline in trout fry compare to 2015, albeit not as great as that of salmon, is of some concern, despite it not being present in the trend analysis or picked up when compared to the 5-year average density.

#### Wye and Usk Foundation Monitoring

As part of a wide scale juvenile salmonid monitoring programme in 2016, the Wye and Usk Foundation surveyed approximately 250 sites in the Wye catchment. These were mostly 5 minute riffle (ME) surveys, with several additional semi quantitative surveys. These data give us a good indication of juvenile salmon distribution throughout the catchment – see the map below.

There are widespread absences of juvenile salmon in the 2016 data. The majority of these sites with no salmon are within the Lugg, Arrow and Monnow catchments, where salmon spawning is still in recovery; numbers are lower and distribution less consistent than elsewhere in the Wye catchment. However, comparison with 2014 WUF surveys in the Lugg and Arrow catchment does show a marked increase in zero counts of salmon in 2016.

Salmon fry are no less prevalent than parr in these 2016 results.



Juvenile Salmonid Summary River Wye 2016



#### Further investigations

During the routine monitoring of fish that NRW carries out on rivers throughout Wales, we have noticed a general decline in salmon fry (0+) numbers; and in certain rivers, notably the Usk, Twyi and Clwyd, a near total absence of this age group in 2016.

These declines, coupled with the significant absences of salmon fry are unprecedented and of immediate concern. Our salmon and sea trout stocks are already facing serious challenges.

We have liaised with Cefas and the Fish Health Inspectorate to carry out fish health screening in the Usk, which is further to the routine *Gyrodactylus salaris* monitoring carried out on the Ogmore, Cleddaus, Dee and Mawddach in 2016. The tests returned negative results for serious pathogens or parasites and a disease and/or fish health cause has been ruled out at this stage.

We have noted that flows and temperatures in our rivers were extreme through November and December, the key spawning period for our salmon, and as such, we are pursuing this as a potential cause with our external partners. Other reasons, including a shortfall in the number of spawning fish and damage arising from very high flows, are not being ruled-out as potentially having had a significant localised affect.



## Juvenile Salmonid Summary River Wye

Appendix - Data from 2016 electric fishing surveys in the Wye catchment.

River	NGR	Site Code	Date Fished	Survey Type	0+ Sal No. per 100m <sup>2</sup>	0+ Sal Grade	>0+ Sal No. per 100m <sup>2</sup>	>0+ Sal Grade	Overall Sal Grade	0+ BT No. per 100m <sup>2</sup>	0+ BT Grade	>0+ BT No. per 100m <sup>2</sup>	>0+ BT Grade	Overall BT Grade
Dernol	SN 90185 75300	W001	01-Sep- 16	Q	117.7	А	6.2	С	А	25.4	В	6.2	С	С
Marteg	SN 95819 71432	W002	09-Sep- 16	Q	28.4	С	5.3	С	D	1.8	Е	1	E	E
Llanwrthwl Dulas	SN 97371 63696	W003	01-Sep- 16	Q	13.8	D	0	F	Е	46.9	А	7.7	С	В
Ithon	SO 10454 68113	W004	14-Sep- 16	SQ	4.5	D	0.3	Е	D	0	F	0	F	F
Clywedog	SO 08394 65065	W005	13-Sep- 16	Q	31.2	С	0.9	Е	D	0	F	0	F	F
South Dulas - Irfon	SN 91822 46916	W007	02-Sep- 16	Q	22.95	D	1.82	Е	D	0.45	Е	0.23	Е	E
Garth Dulas	SN 94231 50110	W008a	16-Aug- 16	Q	36.41	С	4.2	D	С	0.35	Е	4.9	D	E
Chwerfri	SO 02772 51289	W009	25-Aug- 16	Q	83.4	В	0.5	Е	С	1.03	Е	1.03	Е	E
Duhonw	SO 06195 50899	W010	26-Aug- 16	Q	28.7	С	1.2	Е	D	1.2	Е	7.7	С	D
Edw	SO 10952 48673	W011	18-Aug- 16	Q	32.3	С	4	D	D	1.8	Е	3.7	D	E
Sgithwen	SO 11331 41427	W012	23-Aug- 16	SQ	3.03	D	1.52	D	D	3.03	D	1.01	D	D
Lugg	SO 23685 68473	W014	08-Sep- 16	Q	0	F	0	F	F	16.1	С	5.1	С	С
Hindwell	SO 27992 60729	W016	14-Sep- 16	Q	0	F	0	F	F	31.9	В	20.4	В	В
Honddu	SO 29013 27284	W020	01-Sep- 16	Q	0	F	0	F	F	4.1	D	7.8	С	D
Wye	SN 87945 80366	W025	31-Aug- 16	Q	6.99	Е	1.02	Е	Е	1.46	Е	0	F	E

www.environment-agency.gov.uk





# Juvenile Salmonid Summary

### **River Wye**

River	NGR	Site Code	Date Fished	Survey Type	0+ Sal No. per 100m <sup>2</sup>	0+ Sal Grade	>0+ Sal No. per 100m <sup>2</sup>	>0+ Sal Grade	Overall Sal Grade	0+ BT No. per 100m <sup>2</sup>	0+ BT Grade	>0+ BT No. per 100m <sup>2</sup>	>0+ BT Grade	Overall BT Grade
Bidno	SN 89096 80823	W029	30-Aug- 16	Q	67.8	В	12.9	В	В	5.8	D	0.9	E	E
Ithon	SO 08351 80941	W032d	13-Sep- 16	Q	66.7	В	2.5	E	С	1.7	Е	0.8	Е	Е
Aran	SO 15603 71044	W033	12-Sep- 16	Q	1.4	Е	0.9	Е	Е	16.3	С	2.3	D	D
Dulas - Ithon	SO 06143 64518	W035a	12-Sep- 16	Q	3.6	Е	1	E	Е	1	Е	1.5	Е	Е
Cammarch	SN 92635 50312	W043a	17-Aug- 16	Q	69.3	В	5.97	С	В	4.18	D	1.79	Е	Е
Einon	SN 90800 50434	W044b	17-Aug- 16	Q	0	F	0	F	F	69.47	А	3.16	D	А
Llynfi	SO 14382 33065	W047e	15-Aug- 16	Q	0	F	0	F	F	2.43	Е	6.25	С	D
Arrow	SO 21776 50634	W052	06-Sep- 16	Q	0	F	0	F	F	14.5	С	7.99	С	С
Irfon	SN 85064 52855	W095L	24-Aug- 16	Q	31.6	С	2.05	Е	D	8.86	С	0	F	Е
Arrow	SO 34400 59302	The Forge	01-Sep- 16	SQ	0	F	0	F	F	11	В	25	А	В
Pinsley Brook	SO 45085 60611	Cobnash	31-Aug- 16	SQ	0	F	0	F	F	5	С	32	А	В
Arrow	SO 46157 57789	Monk land	01-Sep- 16	SQ	0	F	1	D	Е	0	F	18	А	С
Lodon	SO 61844 49376	Stoke Lacy	31-Aug- 16	SQ	0	F	0	F	F	0	F	13	В	С