



The Spring Salmon run of 2009

1. Most Tweed Spring Salmon are 2.2s – spending two winters in the river and two in the sea. Adding the winter spent in the gravel as eggs makes these fish five winters old. A Spring Salmon run is therefore mainly spawned by the Spring Salmon of five years before, e.g. most of 2009s run was spawned by that of 2004, which was mainly spawned, in turn, by the run of 1999.
2. Spring Runs are measured twice: once as adults going through the Ettrick counter (Table A below) and again as the Abundance of Salmon fry in the Ettrick & Yarrow in September each year (Table B below).
3. There is good evidence (not given here) that Spring Salmon spawn in the middle and upper Ettrick, while the lower area, from Ettrickbridge to the Philiphaugh Cauld is used by later running fish. The counter totals at the end of October can (generally) be taken as the count of the Spring Salmon - peak spawning in the Ettrick is in the first week of November. Those fish counted in November and December, after peak spawning, are later running (and spawning) fish:-

| Salmon | A: COUNTS AT THE PHILIPHAUGH COUNTER | | | Estimated Egg Deposition of fish counted to end October |
|--------|--------------------------------------|------|-----|---|
| | Count to end October | Nov | Dec | |
| 1998 | 2928 | 240 | 20 | 8,784,852 |
| 1999 | 4459 | 669 | 32 | 13,375,684 |
| 2000 | 4483 | 361 | 13 | 13,450,229 |
| 2001 | 3774 | 338 | 50 | 11,321,571 |
| 2002 | 3089 | 1177 | 31 | 9,266,429 |
| 2003 | 1726 | 1704 | 19 | 5,179,035 |
| 2004 | 3711 | 209 | 15 | 11,132,178 |
| 2005 | 3842 | 240 | 289 | 11,525,700 |
| 2006 | 4039 | 512 | 14 | 12,115,890 |
| 2007 | 2350 | 373 | 30 | 7,051,380 |
| 2008 | 2777 | 329 | 0 | 8,331,000 |
| 2009 | | | | |

The 2009 Spring run came mainly from that of 2004 (in Green), which was counted as 3,711 to the end of October, which was slightly above the general average of 3,561 (which is calculated exclusive of the low counts of 2007 & 2008 which might have been influenced by the progressive collapse of the cauld)

| | B: SALMON FRY ABUNDANCE IN THE UPPER AND MIDDLE ETTRICK 1997-2008 | | | | | | | | | | | |
|----------------|---|------|------|-------|------|------|------|------|------|------|------|------|
| | 1997 | 1998 | 1999 | 2000* | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
| Upper Ettrick | 22.0 | 29.7 | 30.2 | | 27.3 | 19.9 | 40.2 | 18.0 | 19.4 | 28.6 | 31.1 | 12.7 |
| Middle Ettrick | 32.0 | 36.8 | 33.3 | | 21.7 | 30.6 | 41.9 | 29.1 | 36.2 | 30.2 | 45.8 | 25.7 |
| <i>Average</i> | 27.7 | 33.7 | 32.0 | | 24.0 | 25.9 | 41.1 | 24.2 | 28.6 | 29.4 | 39.3 | 20.7 |

*No Sampling was possible in 2000 due to high water levels

4. The 2009 spring run came mainly from the fry measured in 2005 (also in Green), which averaged 28.6 per five minutes sampling effort. This was very slightly above the long-term average of 27.8, showing that there was no shortage of fry in this particular generation. In fact, the very good spring catches of 2008 came from an average fry abundance of 24.2, demonstrating that the levels of fry in 2005 were perfectly adequate to give good fishing in 2009.



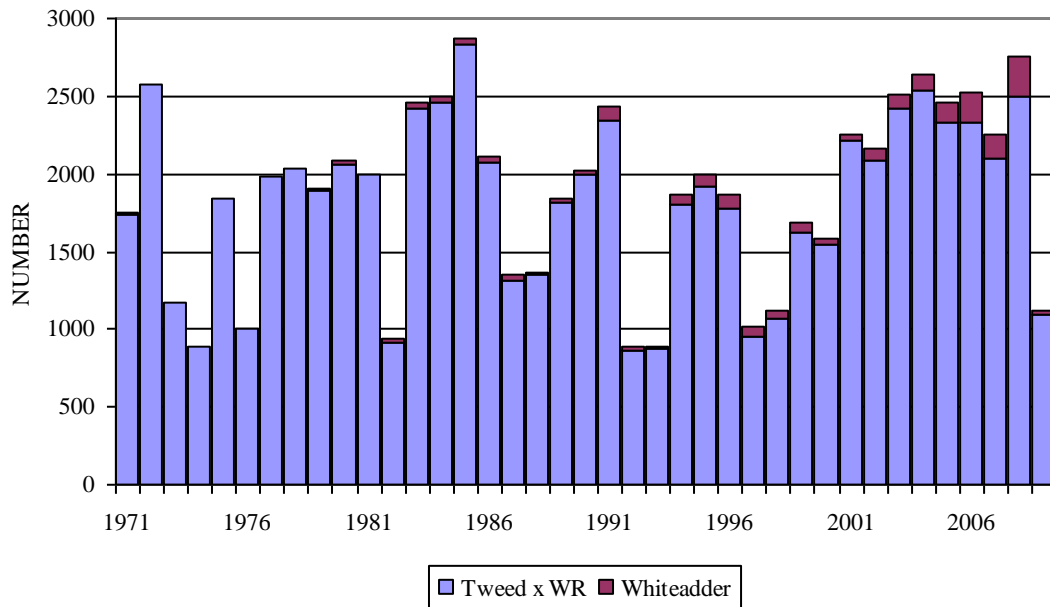
5. The abundances of fry in the upper and middle Ettrick and the numbers of adults counted before the end of October four years later (after the fish have spent two winters in the river and two in the sea and returned as 2.2s) are compared in Table C below:-

| TABLE C: FRY ABUNDANCES AND ADULT SPRING SALMON RUNS FOUR YEARS LATER | | | | |
|--|--------------|--------------------|-----------------------------------|---------------------|
| Fry above Ettrickbridge (nos/5mins) | | Four yrs on | Adult count to end October | |
| 1997 | 27.69 | >>>> | 3774 | 2001 |
| 1998 | 33.71 | >>>> | 3089 | 2002 ⁽¹⁾ |
| 1999 | 31.95 | >>>> | 1726 | 2003 ⁽¹⁾ |
| 2000 | n/a | >>>> | 3711 | 2004 |
| 2001 | 23.98 | >>>> | 3842 | 2005 |
| 2002 | 25.85 | >>>> | 4039 | 2006 |
| 2003 | 41.13 | >>>> | 2350 | 2007 ⁽²⁾ |
| 2004 | 24.17 | >>>> | 2777 | 2008 ⁽²⁾ |
| (1) Low October but high November count | | | | |
| (2) Possible problems of fish passage with collapsing cauld. No count 31st May to 1st August in 2007 | | | | |
| (3) High water during fry sampling | | | | |

6. No relationship is apparent: higher fry abundances do not necessarily give higher counts of adults four years later, nor do lower fry abundances give lower adult numbers. This shows that it is not the amount of fry in the river that is determining the number of returning adults at present.
7. There is nothing in the river that can therefore explain the poor catches of spring 2009. The most likely cause is some effect at sea, which would explain why some other rivers have also had poor seasons.
8. There is, in fact, nothing new in a poor spring catch, as shown by Graph 1 below, which gives the catches in the first half of the season from 1970 to 2008 (the 2008 figure is an interim one). As can be seen from this, all through the 1970's, 80's and 90's good seasons were mixed with poor. The last 10 years have, however, been unusual in that there were no such poor seasons – the last eight years, in fact, being the best period on record with stable catches at a good level.
9. The current estimate is that there are only around 6,000 Spring Salmon for the whole of the Tweed catchment. While enough to fully spawn the small area of the catchment that now produces this type of fish, it is a small enough number to be significantly impacted by the many problems that can affect Salmon at sea and so stocks (and catches) must inevitably fluctuate. This is why this particular stock is given special protection through Catch and Release and the protection of its nursery areas.



Salmon rod catches before 1st July 1970-2008



Graph 1:

The figures are given separately for the Whiteadder as it is, essentially, a "new" population, only recolonising in the 1990's after being fully opened up.

The series starts in 1970, as this was the beginning of this present, Autumn-dominated, phase. From c.1915 to c1965, the river produced mainly Spring Salmon, so catches from that period cannot be compared with this present period, where Spring Salmon are the minor component of production.

- 10. There is also no evidence that fry abundances in the upper & middle Ettrick are significantly less than those found in the rest of the catchment. Table D shows the abundances (average number of fry per minute electro-fishing) of the middle and upper Ettrick (where Spring Salmon are based) compared to other parts of the catchment. While the Ettrick has been surveyed using this method annually since 1997 (excluding 2000, when water levels were too high), this was only extended to the rest of the catchment in 2006 and has not yet covered the upper Tweed. The Ettrick's average is therefore for 11 years of surveys, while those for the rest of the catchment are for single years.

TABLE D: AVERAGE ABUNDANCE OF SALMON FRY IN THE UPPER/MIDDLE ETTRICK AND OTHER PARTS OF THE CATCHMENT

| Sector | Numbers/min |
|---|-------------|
| Ettrick Upper/Middle Average 1997-08 | 6.12 |
| Bowmont & Breamish 2007 | 6.56 |
| Gala & tribs 2006 | 6.64 |
| Teviot & tribs 2007 | 7.23 |
| Leader & tribs 2006 | 7.35 |
| Eden W (below Stichill Linn) 2007 | 7.42 |
| Whiteadder & tribs 2008 | 8.75 |

- 11. The overall average for the Ettrick is at the lower end of this table, though in some single years, its average matched the best. Until the other parts of the catchment have been surveyed with this method several times, however, it is not clear how these will vary from year to year.



- 12.** Given the variation in physical and chemical characteristics between the different parts of the catchment, and the different weather of each year, it cannot reasonably be expected that all areas should have identical abundances of fry in all years. Some will have higher carrying capacities than others and it appears that the Ettrick's is not as good as, for instance, the Whiteadder's. One obvious difference between the two is that while the Whiteadder has a great deal of weed (Water Crowfoot) in it, the Ettrick does not – but that weed is a top class habitat for young Salmon and their food. The Gala, Leader and Teviot also have a lot more Water Crowfoot than the Ettrick – and there will be other differences as well. Cool, wet summers are probably better for fry survival than hot dry ones as well, so abundances will vary from year to year as well.
- 13.** There is no evidence therefore that fry abundance in the Ettrick is consistently a great deal lower than elsewhere in the catchment – and the fry surveys that have been made there since 1997 have covered the years that produced the satisfactory spring catches of 2001 to 2008. In fact, 2008 was, the fourth best Spring Salmon catch recorded for the Tweed since 1970.
- 14.** This also means that there is no evidence that adding extra fry to the Ettrick through a hatchery would have any effect whatsoever. Table A gives the estimated number of eggs spawned by the fish counted up the Ettrick before the end of October. Any hatchery-produced juveniles would have to be significant proportion of these before any significant effect could logically be expected – but since wild production is in the millions anyway, there is no point in artificial production. Even if only 200 female Salmon spawned in the Ettrick, they would still produce around a million eggs, more than enough for natural recovery. The natural recolonisation and recovery of the Spring Salmon of the Whiteadder (from zero fish) fully demonstrates this.