



A preliminary assessment of the status of the salmon stock in the River Usk for 2014

Summary: A preliminary assessment for 2014 indicates that egg deposition will fall below the Conservation Limit. The Usk salmon stock is predicted to remain 'Probably at risk' of failing to meet its management target and is likely to decline further. As in 2013, actions are recommended to address the decline, including changes in major abstractions, controls to reduce fishing mortalities, and a review of outstanding problems in the catchment to inform other prompt action.

1. Purpose

- 1.1 Each year Natural Resources Wales (NRW) uses catch returns from salmon rod licence holders to assess the current and likely future status of stocks in the Usk and other rivers. That assessment helps determine the need for management action.
- 1.2 Due to the time required to obtain and analyse licence returns, the full assessment based on the 2014 season will not be available until April 2015, which could further delay the implementation of management action.
- 1.3 In November last year, the Wye & Usk Foundation used catches recorded from major Usk fisheries to predict the rod catch declared to NRW and egg deposition for 2013. That preliminary assessment accurately predicted a decline in the status of the Usk salmon stock to 'Probably at Risk', subsequently confirmed in April (CEFAS/EA/NRW 2014).
- 1.4 This report provides similar predictions for 2014, with the help of NRW, to provide a preliminary assessment of the status of Usk salmon stocks, once more enabling early initiation of management action.

2. Estimation of the declared rod catch and egg deposition in 2014

- 2.1 The annual rod catches of salmon at Upper Llangybi, Lower Llangybi (David Addams-Williams, pers. comm.), Llanover (WUF website), Monks wood (Helen Harrison, pers.comm.) and Merthyr Angling Association's waters (Tony Rees, pers.comm.) have been combined and related to the annual catches declared by licence holders for the last five years. Together, the catches at these fisheries have comprised a large proportion of the Usk's rod catch, ranging from 35% in 2011 to 49% in 2010, with an average of 45%.

	U&L Llangybi, Llanover, Merthyr AA, Monkswood	Usk rod catch Declared to NRW by anglers	Sample as % of declared Usk catch
2009	216	491	44%
2010	284	580	49%
2011	250	707	35%
2012	483	1014	48%
2013	228	543	42%
2014	179	395	5yr Mean: 45%

Range: 365-511 35%-49%

2.2 Applying that range and average to the 2014 catch at these fisheries indicates that the declared rod catch for 2014 from licence holders for the whole river will be between 365 and 511, and probably about 395.

2.3 A sample of 63 rod caught salmon from Upper Llangybi and Monkswood fisheries was used to characterise the weight distribution of salmon in 2014, i.e.

Range (lbs)	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17
No.	1	2	6	6	6	6	11	4	8	2	2	3	4	2

Note: where the angler gave the weight as, say, 8 lbs, the fish was placed in the 7-8lbs range.

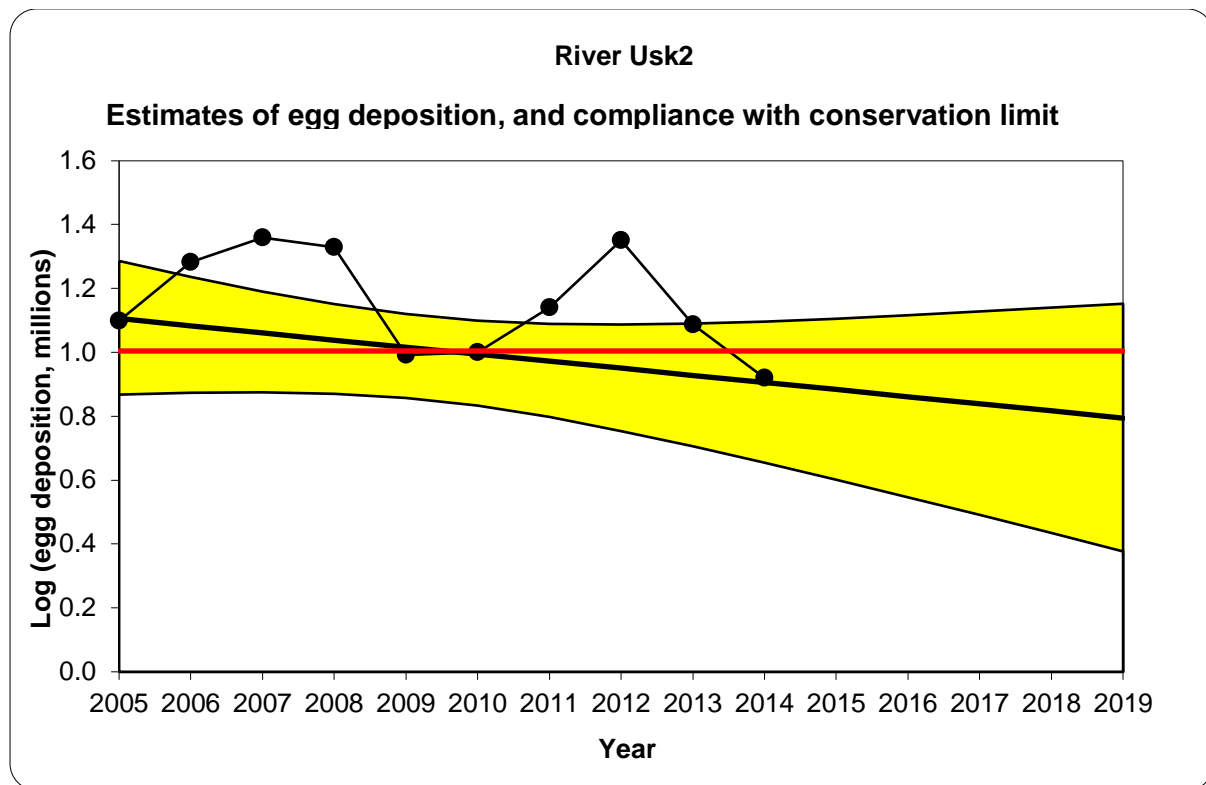
2.4 Using these data, and assuming that applying recent values for factors such as catch & release rate of 70% and exploitation (13% for grilse and 16% for multi-sea-winter fish), Paul Greest (NRW)(per. comm.) has estimated that egg deposition in 2014 will be between 76% and 107% of the Conservation Limit.

2.5 The central estimate, based on a rod catch of 395, indicates egg deposition at 82% of the Conservation Limit, i.e. 8.3 million eggs. This compares to a Conservation Limit of 10.11 million eggs (Table 23 in CEFAS/EA/NRW 2014).

2.6 It is likely that egg deposition this winter will be the worst since 2003, when it was 89% of the Conservation Limit, and possibly the worst since the early 1990s.

3.0 Assessment of stock status

3.1 NRW has also provided a preliminary stock assessment for this year and prediction for 2019 using the central estimate (as in 'River Usk 2' below) and also the range for egg deposition.



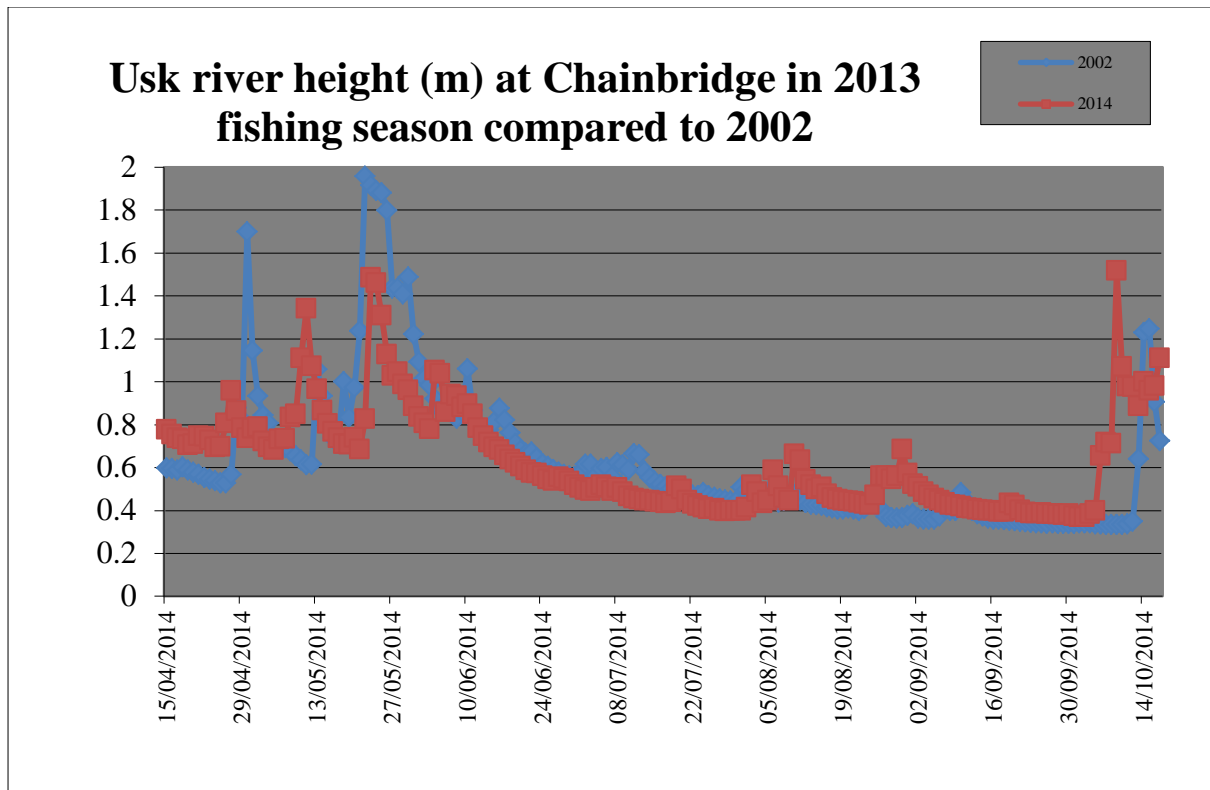
3.2 Regardless of whether the highest or lowest estimate of egg deposition is used for 2014:

- Spawning is predicted to remain below the Conservation Limit, on average
- The trend for egg deposition is negative (though not statistically significant)
- The Usk is predicted to remain 'Probably At Risk'.

3.3 The shortfall in egg deposition this year, 2014, will be about 2.1 million eggs, equating to about 700 adult salmon of both sexes. The true rod catch for 2014 will be greater than that declared, NRW assumes 10% greater, i.e. about 440. So even if all rod-caught salmon had been returned, and survived to spawn, there would still be a shortfall this year. If the trend continues, the shortfall in 2019 is predicted to be about 1300 salmon, of both sexes.

3.4 The downward trend would be much more severe without the high rod catch in 2012 which, as highlighted last year, was an exceptionally wet season (Mawle, 2013). The predicted status may therefore be optimistic.

3.5 Flow conditions in 2014 were poor for salmon migration and angling in the summer though not exceptionally so, as indicated by the heights on the gauge at Chainbridge below. Flows were similar in 2002 when the Usk rod catch was 616 salmon (data courtesy of NRW) and egg deposition twice as great as that predicted here for 2014.



Gauge Data courtesy of NRW

3.6 Abstraction, especially at night from the lower reaches at gauge heights less than 0.7m, would have reduced the number of salmon entering the Usk, though not as much as in many years. The model developed by the Wye & Usk Foundation indicates that in 2002, abstraction reduced the number of salmon entering the Usk before the end of September by about 12 percent, and reducing the total run by more than 5 percent (John Lawson, pers. comm.). A similar impact this year would reduce the number of salmon spawning by about 100 or so.

4.0 The need for action

4.1 Under the EU Habitats Directive, action is also required for the Usk to be in favourable condition, or moving towards it, in 2015 as a Special Area of Conservation under the Habitats Directive. The Usk salmon stock is a primary reason for designation of the river. The Directive requires a precautionary approach to be taken. This preliminary assessment suggests that by 2015, the salmon feature will not only still have an unfavourable status but be in decline.

4.2 This assessment shows that it is very unlikely that there has been any improvement in stock status since last year. It is not known if any new action has been taken as yet by NRW to respond to the decline or last year's recommendations for action.

4.3 The latest survey of juvenile salmon densities in 2013 (Sophie Gott, NRW 2014) found that about 1/3 of sites have densities of salmon fry or parr which are statistically significantly lower than would be expected (slightly more so in the case of fry than parr). This tends to support concerns about levels of egg deposition. Despite this, there were indications that

where work had been done to improve access and/or habitat, juvenile salmon densities had improved. Simon Evans, WUF (pers. comm.).

- 4.4 Most electrofishing sites are on tributaries or the upper river which is where fully quantitative electrofishing is practical. However, the main river provides a large, if not the majority of juvenile nursery area and even now salmon spawn all the way down to the head of tide. Sophie Gott (2014) noted that densities of fry in the main river may have declined since the 1990s, as indicated in Figure 14a, below, from her report. While these data are imprecise, if there has been a decline in the quality of habitat in the middle and lower reaches of the main river, it could have far greater consequences for smolt production than indicated by the standard survey sites.

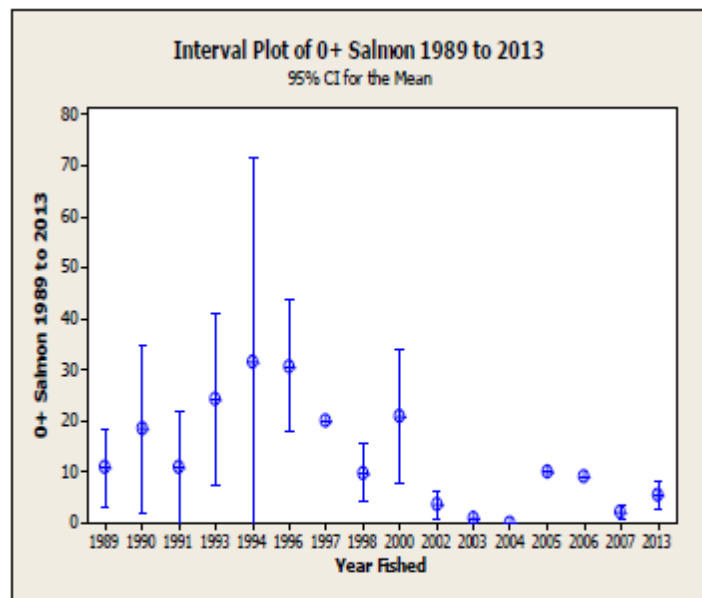


Figure 14a – Mean number of salmon fry caught in 5 min riffle surveys on the main river Usk, 1989 to 2013

- 4.5 While Welsh Water has voluntarily adopted a slightly improved abstraction regime at Prioress Mill in the lower reaches, it was still taking up to a quarter of the river flow at night in 2014, which under lower flows is when salmon generally migrate. This could have been avoided without jeopardising public water supply.
- 4.6 Although many Usk anglers do return most, if not all, of the salmon they catch, others do not. Furthermore, stale salmon are being killed which have little merit as food. Furthermore, the proportion of salmon, as declared to NRW, may be optimistic. Those anglers who disregard the legal requirement to make a catch return may be more inclined to ignore requests to return salmon.



4.7 In October, the Usk Fishing Association circulated this picture of a stale, pale-fleshed hen fish from Jonathan Carthew who runs the Black Mountain Smokery in Crickhowell. He asked: *'Could you send this picture out to all members suggesting that it is not worth killing fish this late in the season as they are full of eggs or milt and are inedible even when smoked? I am seeing far too many like this these last couple of days.'*

5.0 Recommendations

5.1 Welsh Government policy, as described to the North Atlantic Salmon Conservation Organisation (NASCO, 2013), is that action should be sufficient for spawning escapement to:

- have a consistently positive trend;
- be 'Probably Not at Risk' of failing the management target within 5 years; and
- deliver the longer term goal, within 10 years, of being 'Not at Risk'.

5.2 **Outstanding environmental issues** affecting the salmon stock should be reviewed as a matter of urgency and prompt effective action taken to address them.

5.2 **The impact of abstractions** on both smolt and adult salmon migration, as well as juvenile production is one such issue. An improved abstraction regime has been developed by the Wye & Usk Foundation to reduce this impact, working with the major abstractors, Welsh Water and the Canal & Rivers Trust, as well as NRW. This new regime is expected to be endorsed, in large measure, by NRW by the end of the year. Even if new licences or operating manuals cannot be fully implemented for 2015, NRW should request Welsh Water and the Canal & Rivers Trust to reduce abstraction voluntarily in line with the new regimes, as far as practical.

5.2 If implemented fully, the models developed by John Lawson (WUF), indicate that the annual salmon run into the river would be increased by about 7 percent on average, maybe more. If the annual run currently averages 4000 to 5000 salmon, that would be an extra 300 or so salmon on the redds, assuming that most survive to spawn.

5.3 The improved abstraction regime would also mean that a greater proportion of salmon run during the fishing season and the impact on rod catch is likely to be substantially greater.

That could give fishing interests a distorted impression of the benefits for the salmon stock as a whole.

5.4 **More effective mandatory fishing controls** should be introduced as soon as possible to ensure not only that a larger proportion of salmon are returned alive but also without reducing their chances of surviving to spawn. More attention should be given to both matters. The fishing techniques currently allowed on the Usk are likely to result in a high level of mortality. Gargan et al (2015) report that only 55 percent of salmon caught on Flying Cs survived to spawn, compared with 98 percent for those caught on fly.

5.5 The policy for rivers, such as the Usk, which are assessed as 'Probably at Risk' of failing the management objective) and the trend is down...

'... and C&R rate < 90%, then voluntary catch and release (C&R) will be promoted for 1 year. If this fails to significantly improve C&R rates, mandatory C&R or closure of the fishery will be considered. Protected rivers such as SACs (Special Areas of Conservation) are given particular emphasis.' From Annex 7 in CEFAS/EA/NRW (2014).

Had last year's recommendation to go out to consultation been acted on (Mawle 2013), NRW would have been ready now to introduce measures for 2015 and advise fishery owners clubs and anglers well in advance.

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