

Know Your River - River Tywi Salmon and Sea Trout Catch- ment Summary

Introduction

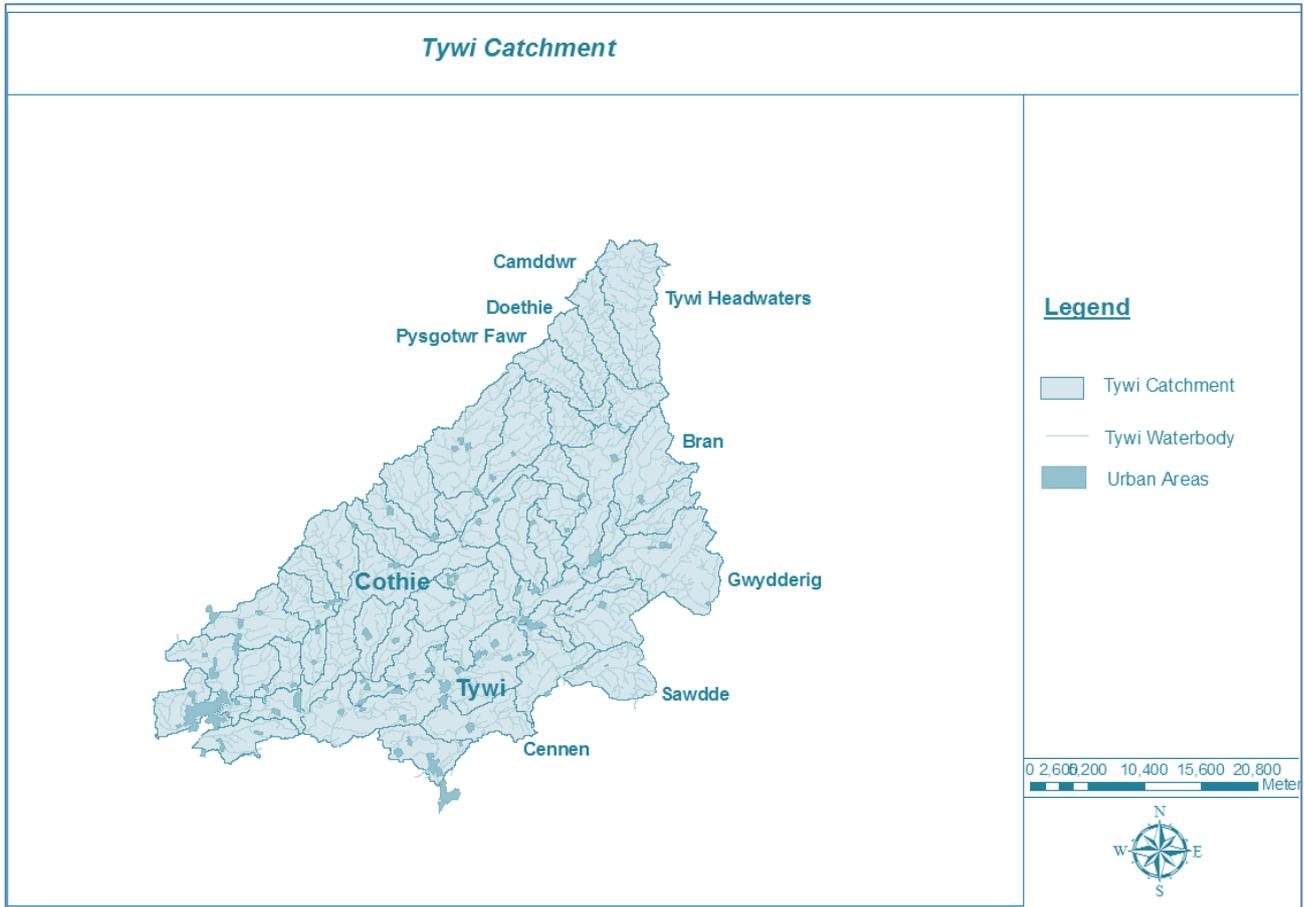
This report describes the status of the salmon and sea trout populations in the Tywi catchments. Bringing together data from rod catches, stock assessments and juvenile monitoring, it will describe the factors limiting the populations and set out the challenges faced in the catchment.

Action tables set out habitat improvements to restore freshwater productivity of salmon and sea trout populations. These tables also include some 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.

River Tywi



The River

The Tywi catchment is located in Carmarthenshire and originates in the Cambrian Mountains. The 111km long river initially flows steeply down through moorland and forestry until the gradient reduces and the land-use is predominantly animal agriculture. The upper river flows for 10km into Llyn Brienne, and then a further 100km before draining into the Severn Estuary below Carmarthen. Many tributaries join the Tywi on its course to the sea. On the left bank, the Bran joins near Llandovery. Joining the river at Llangadog, the Sawdde flows off the Black Mountain, the wettest area in the catchment. The Cothi is the largest tributary of the Tywi, and joins the main river close to the tidal limit. Another major tributary, the Gwili, joins within the tidal reaches.

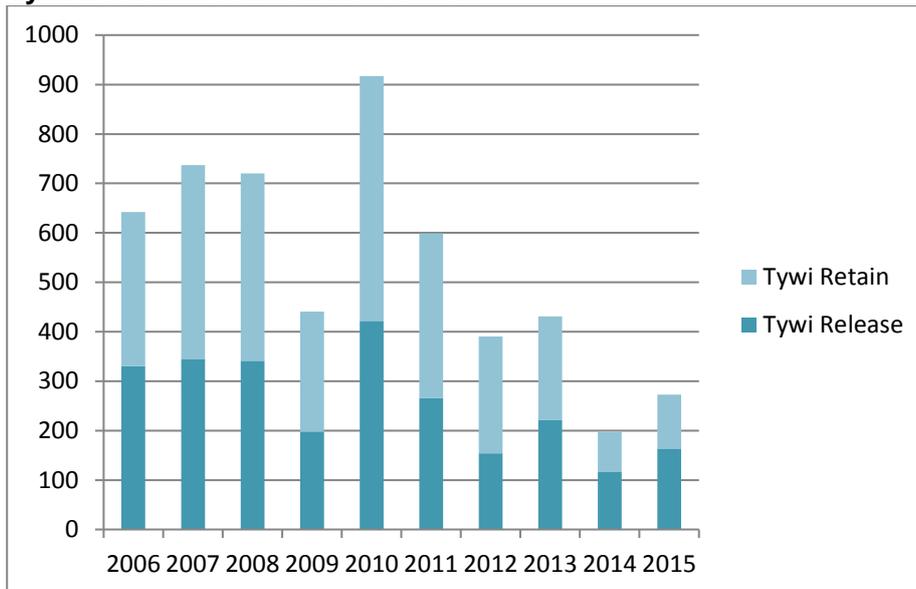
The Tywi supports a nationally important salmon and sea trout (sewin) fishery. Sea trout are the predominant salmonid, with a large number of salmon also reported.

Rod catches

The following graphs show the total declared rod catches of salmon and sea trout on the Tywi.

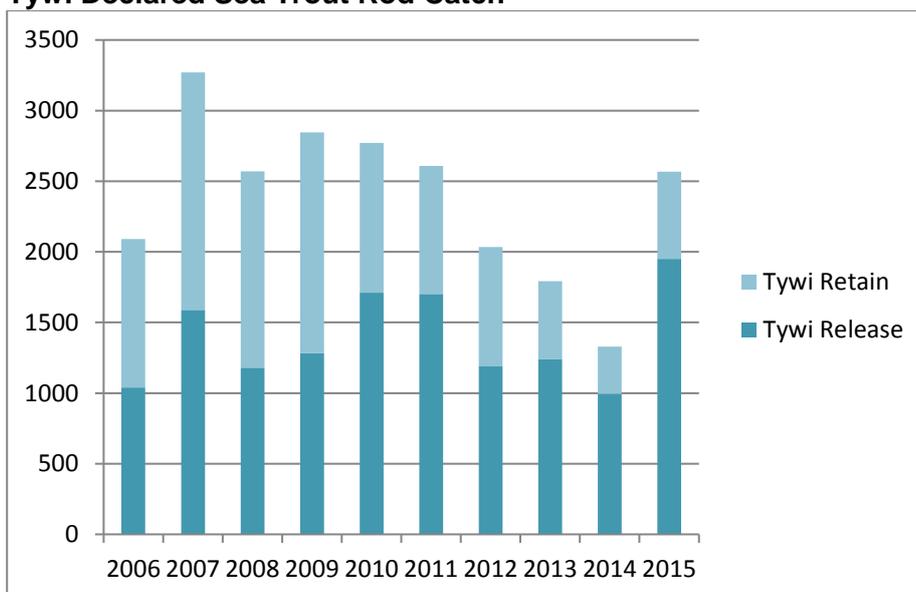
Declared salmon rod catches are variable over the period, with the highest catches reported in 2007 and 2010. The average proportion of the salmon catch returned alive has been reasonably stable over the past 10 years, with an average release rate of 49%. The release rate in 2015 was 60%.

Tywi Declared Salmon Rod Catch



Declared sea trout rod catches are also variable, although reported catches have shown an overall decline over the past 10 years. The proportion of the sea trout catch returned alive has increased considerably over the past 12 years, from a release rate of 44% in 2002 to 76% in 2015.

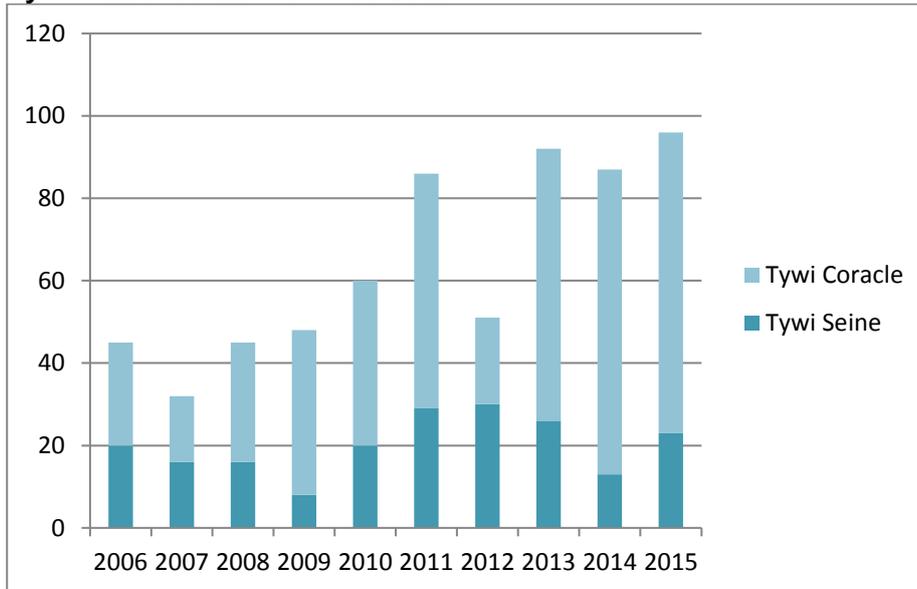
Tywi Declared Sea Trout Rod Catch



Net catches

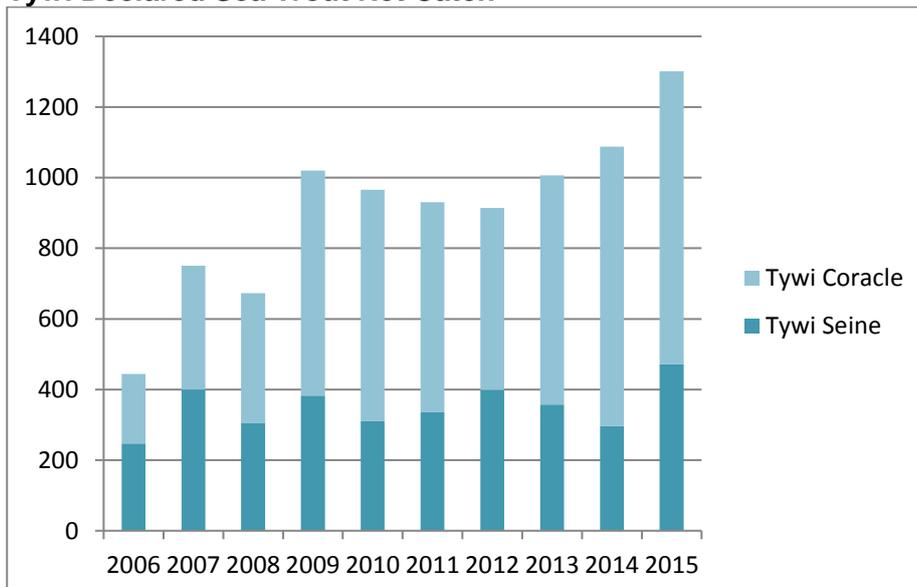
Declared salmon net catches are variable over the period, with the highest catches reported in 2013 and 2015. The coracle nets (8 licences) typically report the highest proportion of the salmon catch (average proportion 66% over the period 2006 to 2015), although there are a number of years when the seine net catch (3 licences) is higher.

Tywi Declared Salmon Net Catch



Declared sea trout net catches are also variable, with the highest catches reported on 2014 and 2015. The coracle nets typically report the highest proportion of the sea trout net catch with an average proportion 60% over the period 2006 to 2015.

Tywi Declared Sea Trout Net Catch

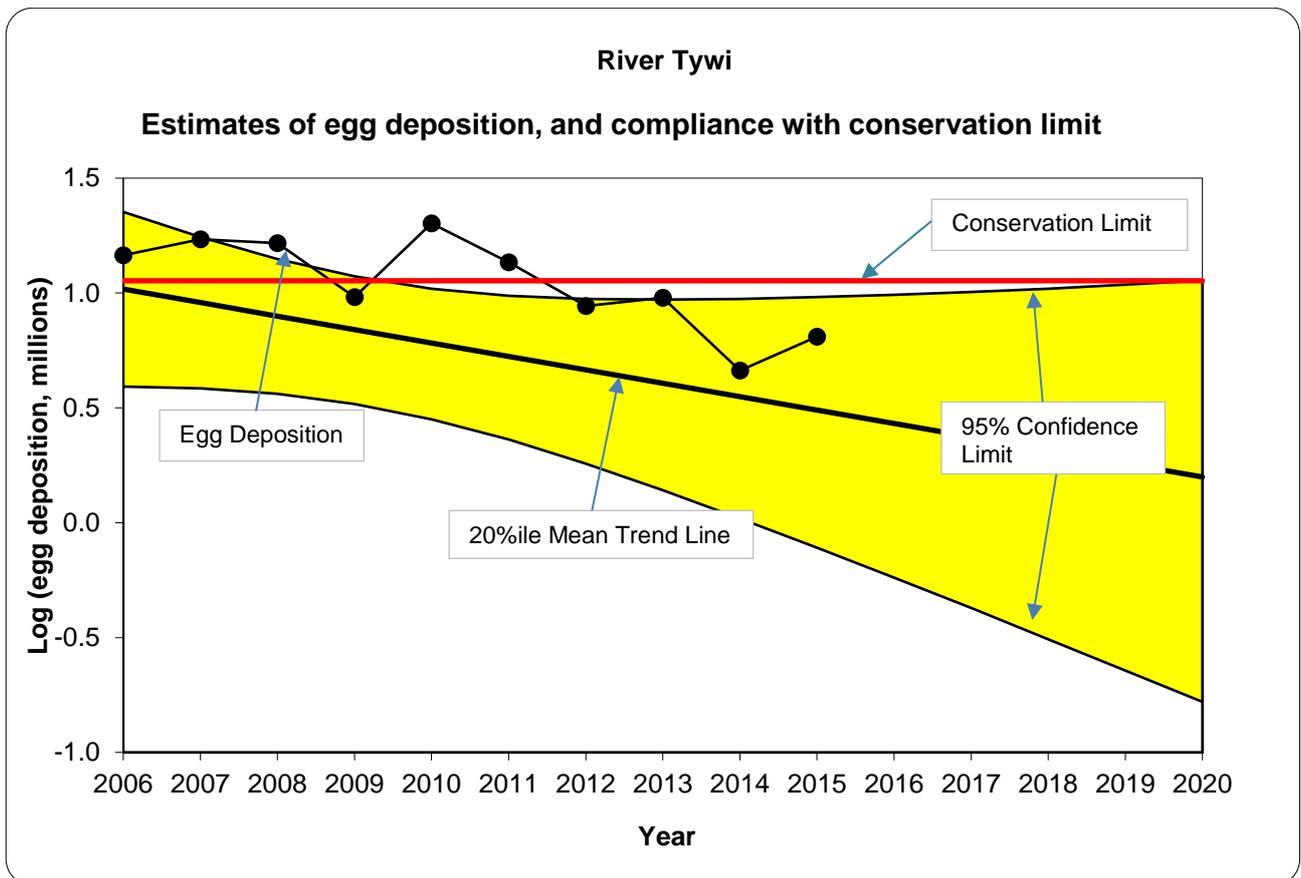


Stock Status

Conservation of Salmon

Salmon stock status is assessed through the use of 'Conservation Limits' which provide an objective reference point against which to assess the status of salmon stocks in individual rivers. 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. This is why, 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 in order to conserve salmon stocks in the future.

The conservation limit for the Tywi is set at 11.3 million eggs, represented by the red line on the graph. The current number of eggs being deposited is below the Conservation Limit, and the Tywi is classed as '**at Risk**'. In 5 years time, the predicted status of the Tywi salmon stock will continue to be '**at Risk**'. Based on current and future trends, the Tywi salmon stock will continue to **decline**.

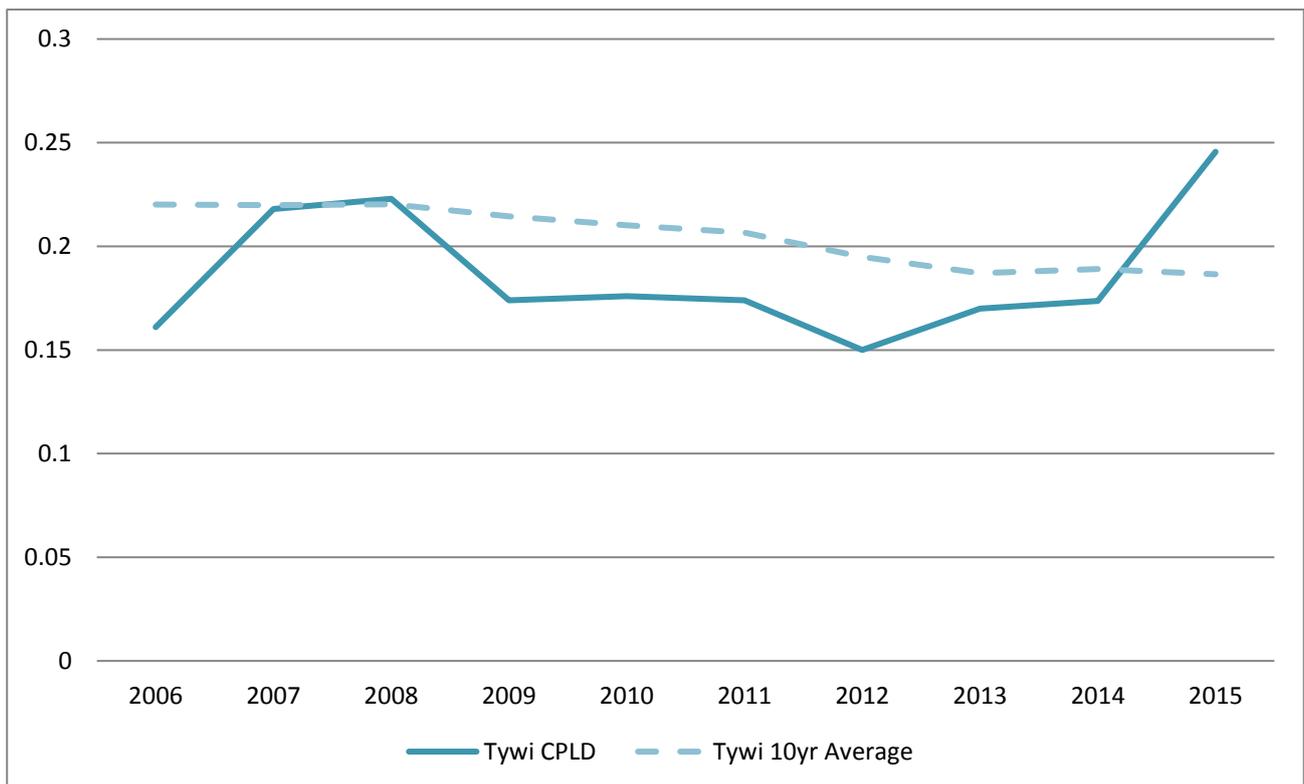


Conservation of Sea Trout

Our approach to assessing sea trout stock performance is still under development. It is based on catch trends in the last three years compared with those in the previous ten. The assessment gives an early warning about potential problems and assists with considering whether any further management actions are required. It provides an indication of changes in fishery performance, though this is not always a reflection of stock performance.

Catch Per License Day (CPLD) is the average number of fish caught for each day fished on the river and as such accounts for the variability in the amount of fishing effort between years. These statistics can be a better guide than simply looking at the total catch.

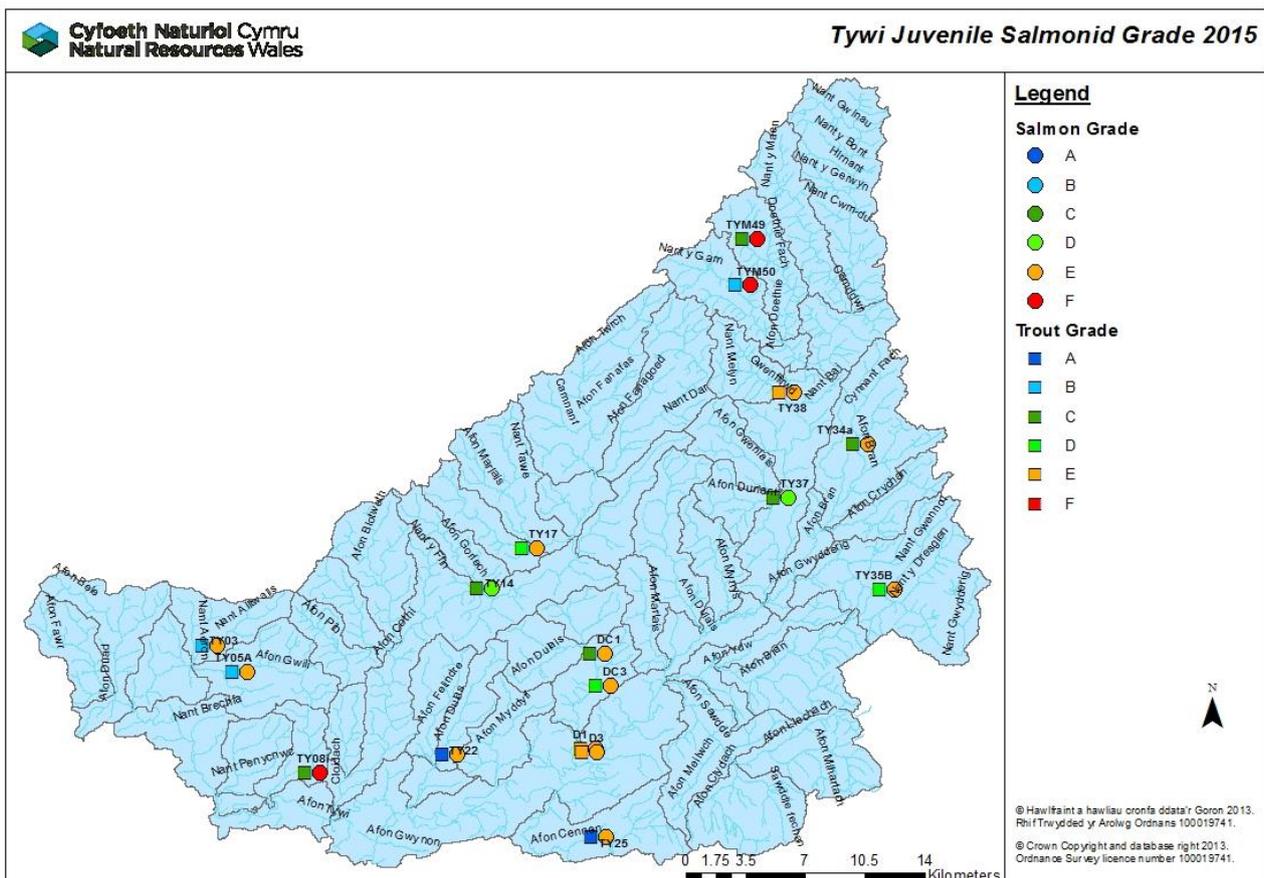
The CPLD figures for the Tywi for the period 2006 to 2015 are shown below. Catch Per Licence Day on the Tywi has been variable in the past but has stabilised in recent years. The Tywi sea trout fishery is currently classed as **'Probably not at Risk'** (based on 2015 assessment).



Juvenile Monitoring

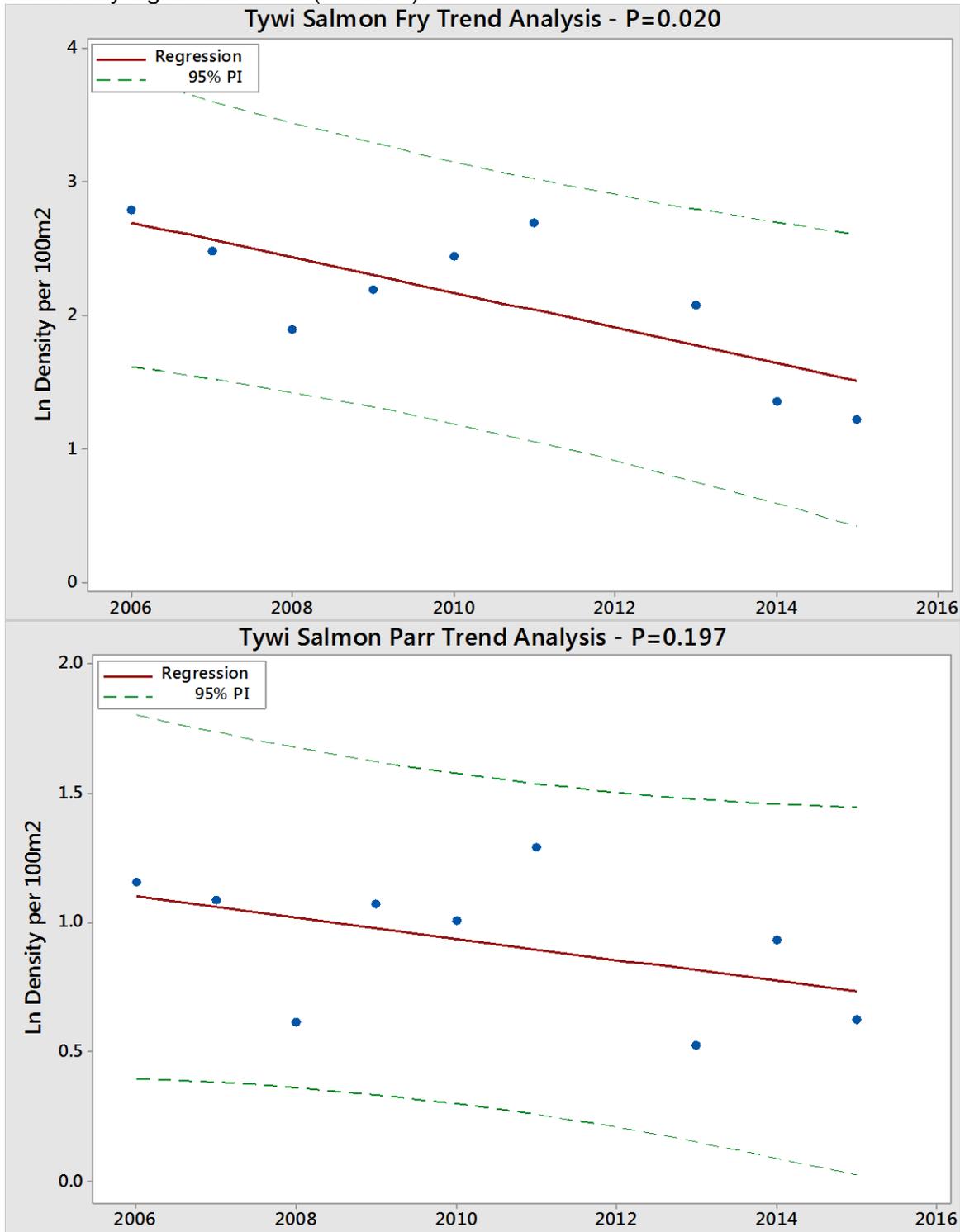
The following map shows the results of the 2015 juvenile salmonid population surveys. They display the National Fish Classification (NFC) grades which have been developed to evaluate and compare the results of fish population surveys in a consistent manner. The NFC ranks survey data by comparing fish abundance at the survey sites with sites nationally 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 NFC.

| 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 |

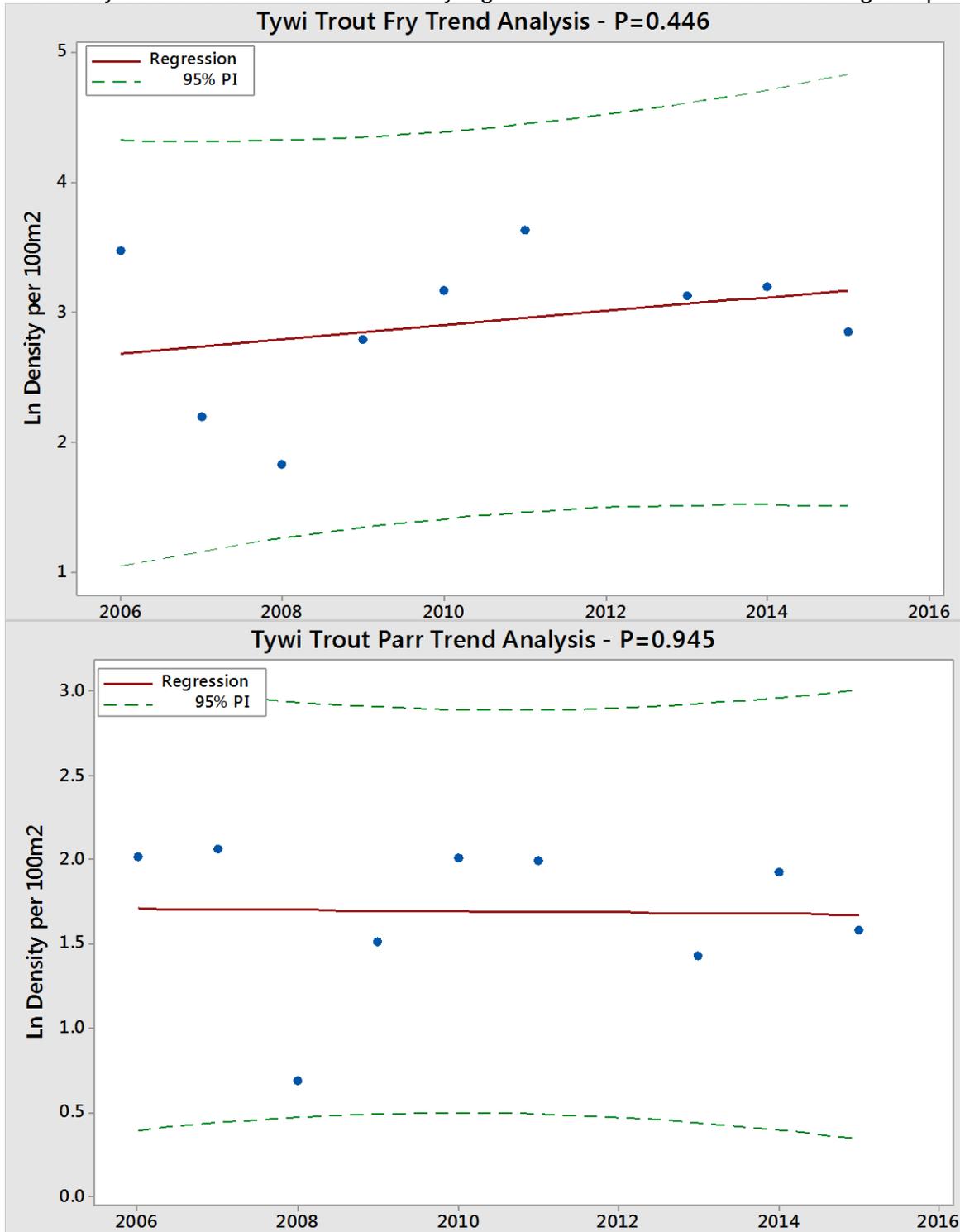


Juvenile Trend Analysis

Juvenile salmon numbers have varied over the last 10 years and fry data shows a downward trend which is statistically significant ($P=0.020$). The parr data also shows a downward trend but this not statistically significant either ($P=0.197$).



Juvenile trout data has also been variable over the last 10 years. The fry data shows a very slight upward trend but this is not statistically significant. Parr data shows a slight downward trend but like the fry data this is also not statistically significant and 2014 data shows a slight improvement.



Fisheries Mitigation Plan

| Catchment: | Tywi | Target Salmon Smolt: 4149 Target ST smolt: 3640 | m2 | | | | |
|--|---|--|---|----------------------|------|--|-------------------------|
| Site | Mitigation action | Benefits | % target | Estimated cost | Lead | Partner(s) | Timescales for delivery |
| Doethie /Pys-gotwr sub-catchments | Expansion of current application of limestone sand and potential incorporation of hydrological source liming. | Monitoring study carried out on existing scheme benefits suggests that the expectation for salmon densities has been achieved (GES). Sea trout densities are yet to achieve expectation so there is more scope for increase in sewin densities. If we take the target for both salmon and sea trout to be 0.7 EQR then the increase in st smolt output would be 1710 . | 60% St target & 12% of Sal target | £14k/annum (ongoing) | CRT | Carmarthenshire Rivers Trust, DCWW, Land-owners. | Ongoing |
| Doethie sub-catchments | Delivery of multiple (3) fish easement schemes on natural structures at locations on Doethie. | Monitoring study carried out on existing scheme benefits suggests that the expectation for salmon densities has been achieved (GES). Sea trout densities are yet to achieve expectation so there is more scope for increase in sewin densities. See benefit credit above. Easements of Doethie will serve to unlock maximum potential from application of limestone sand and primarily benefit sewin with a further 500 smolt output | 13.7% ST smolt target | £50k (over 3 years) | NRW | Carmarthenshire Rivers Trust, DCWW, Land-owners. | 3-5 year programme |

| | | | | | | | |
|--|--|---|---|----------------------|-----|---|--------------------|
| Various locations within Tywi catchment | Delivery of numerous technical fish passage improvement schemes in upper Tywi catchment | Benefits will be calculated for each individual scheme and will be determined by extent of habitat upstream and the existing "porosity" of the structure pre and post treatment. Improved access to 12km of river reach with ave width of 5m equates to 60,000m2. If we assume modest improvement of 1* sal and 2 St smolts per 100m2 due to better access then this would equate to 600 salmon smolts and 1200 st smolts | 14.4% of Sal target and 32.9% of ST target | £90k (over 3 years) | NRW | CCC/Landowners | 3-5 year programme |
| Tywi / Cammddwr arms | Continuation of existing application of lime powder u/s llyn Briann with potential scope for expansion | Maintained water quality downstream of dam and maintain additional smolt output at 1224 (st) and 3366 (sal) from affected reach (17km@15m ave width) | 81.1% of Salmon target and 33.6% of ST target | £30k/annum (ongoing) | NRW | DCWW/CRT | Ongoing commitment |
| Tidal reaches of main river | Buy back of adult salmon/sewin from net fishery | The benefits arising from the net buy back would be mainly associated with sea trout. The target would be an increase in escapement of 150 adult sea trout which equates to the smolt output target and takes into account rod exploitation and in-season mortality. | 100% of ST target and 10% of Sal target | TBC | NRW | Netsmen /CFF/CRT/Angling Associations/private interests | 1 year |
| Nant-y-Fynn & Nant Meylyn | Delivery of 2 strategic Riparian Habitat Schemes | In both cases pre-monitoring would be required to determine existing smolt output and target should then be 0.7 EQR (FCS2). The benefit will then be 0.7 EQR - existing output. | <5% of sal and st targets | £40k | NRW | CRT | 1-2 years |
| Whole Catchment | Enforcement action to reduce illegal activity | Reduction in illegal activity on catchment through intelligence led work. | N/A | - | NRW | | Ongoing commitment |