

Know Your River - Dwyryd

Salmon & Sea Trout Catchment Summary

Introduction

This report describes the status of the salmon and sea trout populations in the Dwyryd catchment. 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.

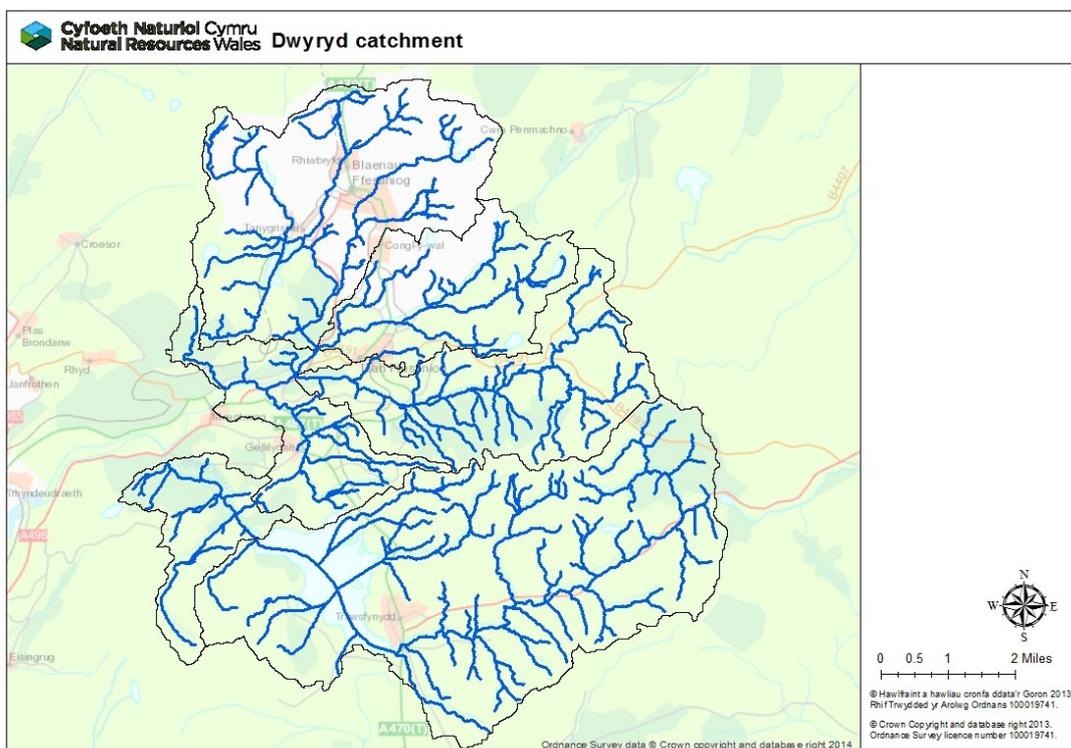
Action tables set out habitat improvements to restore freshwater productivity of salmon and sea trout populations. These tables also include some work which will be carried out by our partner organisations, not just Natural Resources Wales (NRW).

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.

Catchment

The Dwyryd is predominantly rural with agricultural activity being dominated by sheep farming in the upper reaches of the catchments, gradually changing to mixed sheep and beef further down the valley. Industrial development is limited to Blaenau Ffestiniog. Blaenau Ffestiniog



was once the largest slate quarrying town in the world and now has a legacy of derelict land covered in slate spoil. Slate quarrying continues at 4 main sites around the town. Both the Barlwyd and Goedol have suffered from slate dust contamination in the past although remedial work at the quarries has reduced the occurrence of this source of intermittent pollution in recent years.

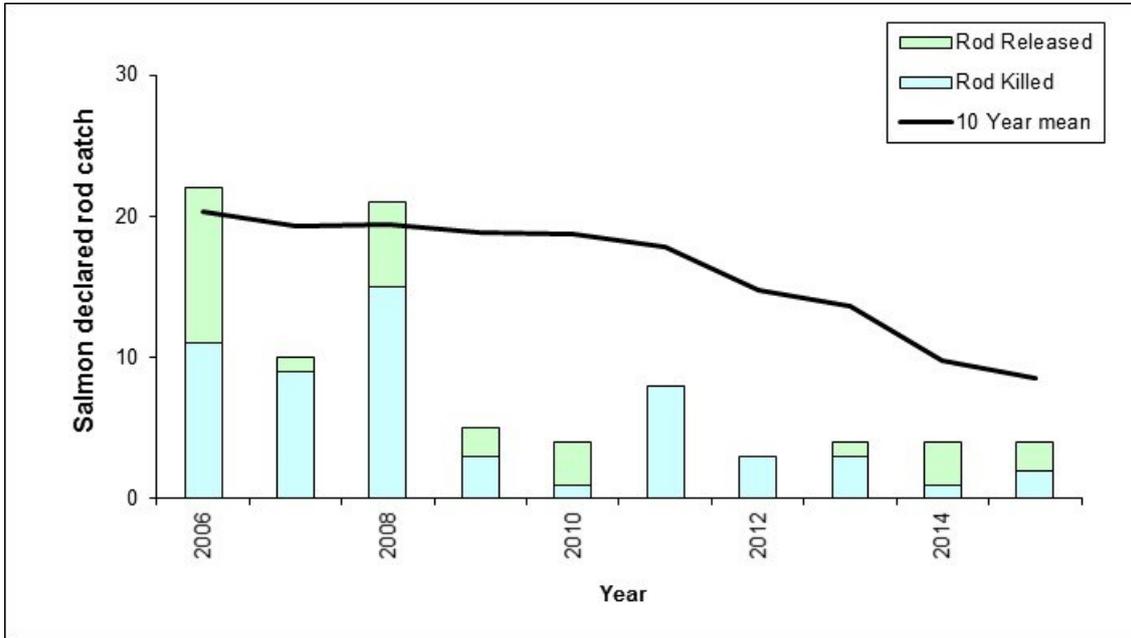
This mountainous area, directly open to the prevailing south westerly winds, receives heavy rainfall. Although the acidity of rainwater is not high, the volume of rain falling in the area gives rise to high annual acid deposition. In the absence of neutralising bases within the thin soils, these areas are 'acid vulnerable' and as a result their water courses are subjected to periodic acid flushes which can reduce water quality and salmonid fish survival. In addition, the abundance of old mine workings, slate quarries and coniferous afforestation are known to exacerbate the impact of acidification in parts of the Dwyryd catchment.

The terrain of this area, with its upland lakes and high rainfall, also makes it well suited to hydroelectric power (HEP) generation. In all there are 10 HEPs situated in the Dwyryd catchment. The major schemes at Tanygrisiau and Maentwrog (Dwyryd) have the potential to impact upon salmonid fish by causing fluctuations in natural flow and temperature regimes.

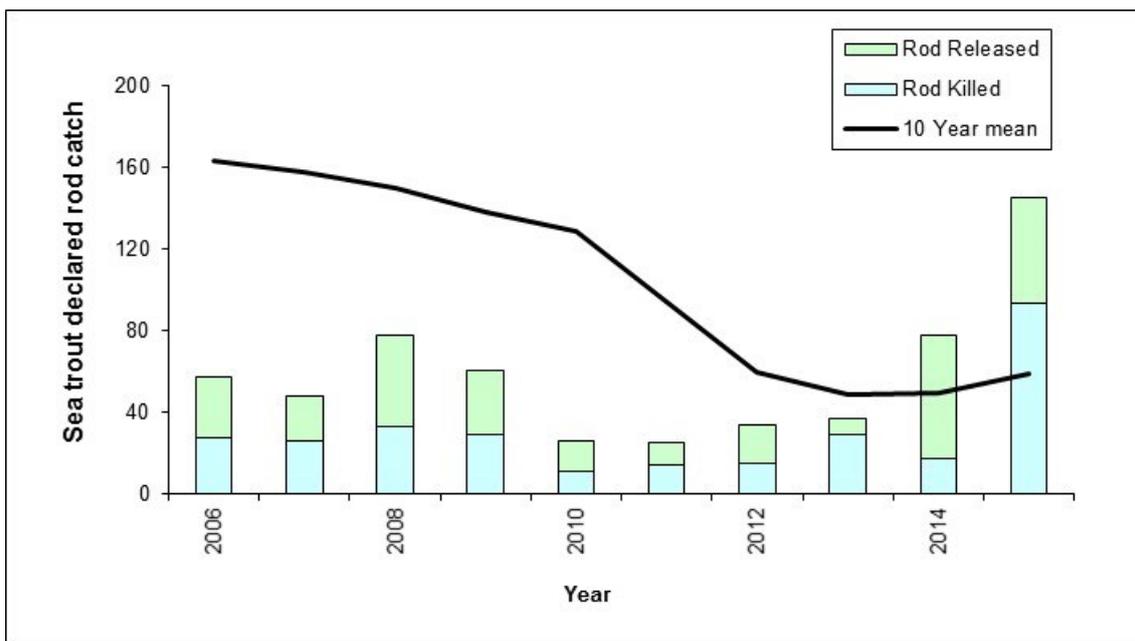
Rod catches

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

Salmon rod catch – has declined over the past 10 years. The release rate in 2015 was 50%. This needs to improve to conserve stocks. The North Wales average is 65%.



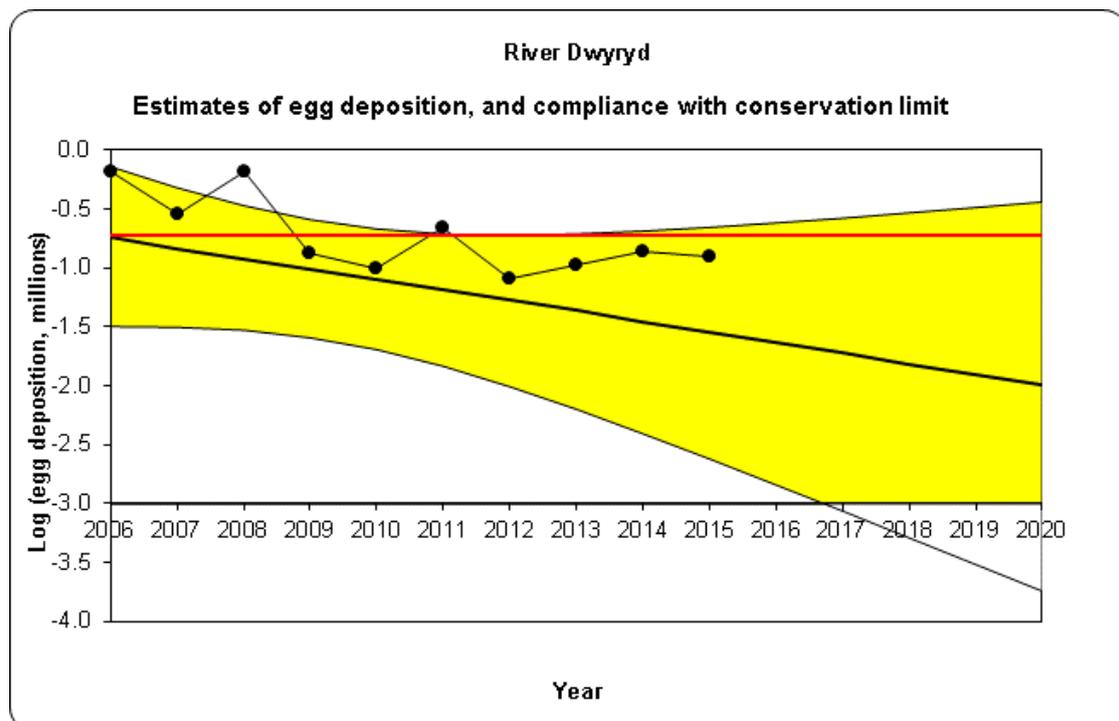
Sea trout rod catch – had declined since 2003 however improvements have been seen since 2014. The release rate in 2015 was 36%. This is poor and must improve. The North Wales average is 72%.



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.



Are enough salmon eggs being deposited to conserve salmon stocks in the catchment?

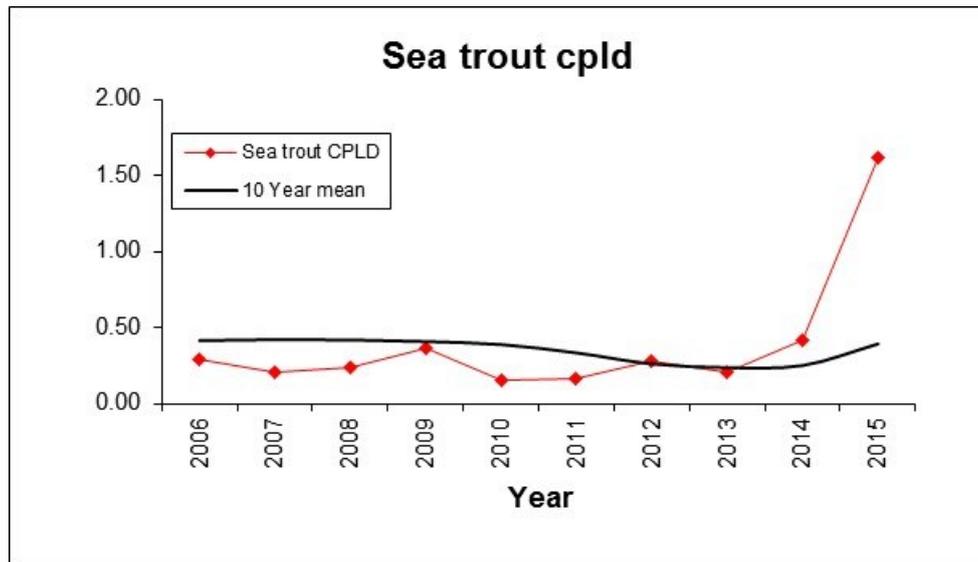
The red line represents the number of eggs required to be deposited to sustain a healthy salmon stock.

- Current number of eggs being deposited puts stocks **probably at risk**
- In 5 years' time the predicted status of salmon stocks will be **probably at risk**
- Based on current and future trends the stocks of salmon 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.

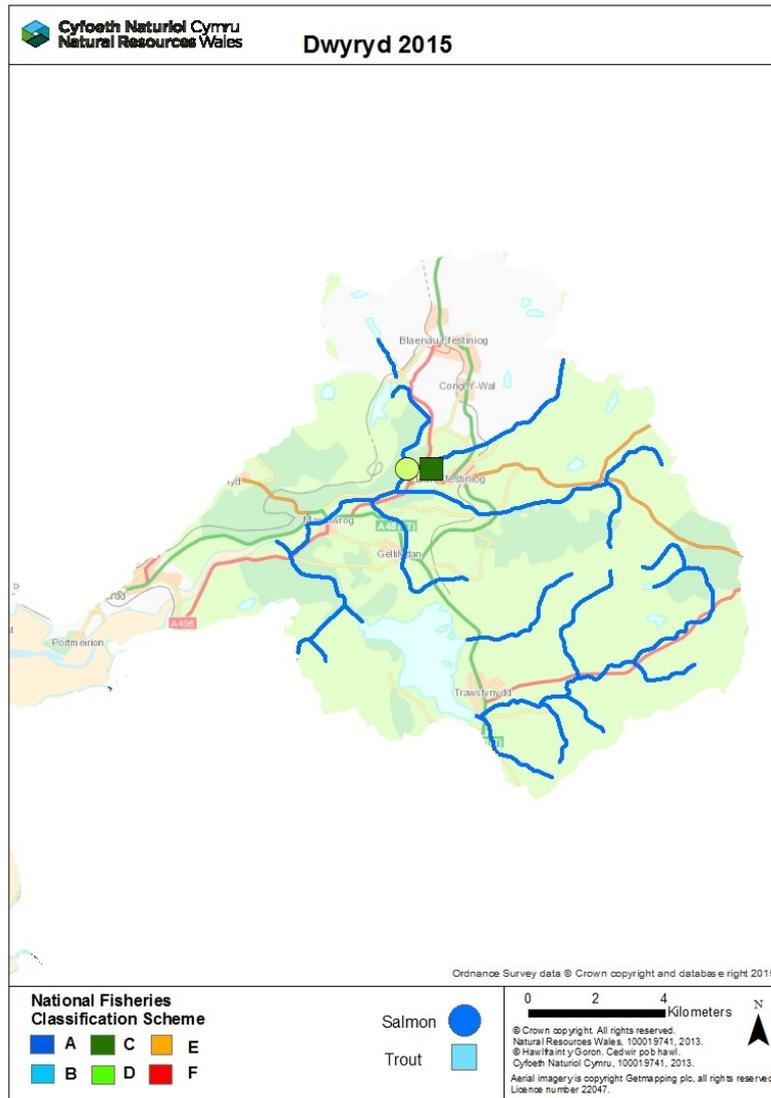


- The latest 10-year trend in CPLD on the Dwryd is **stable**
- Average CPLD for the most recent 3-year period is in the **>80% of the range** of CPLD figures reported in the previous 10-years
- Combining the above measures, the Dwryd is classified as **“not at risk”**; i.e. the fishery appears to be performing reasonably well with no immediate concerns about the status of the adult stock

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	Description	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

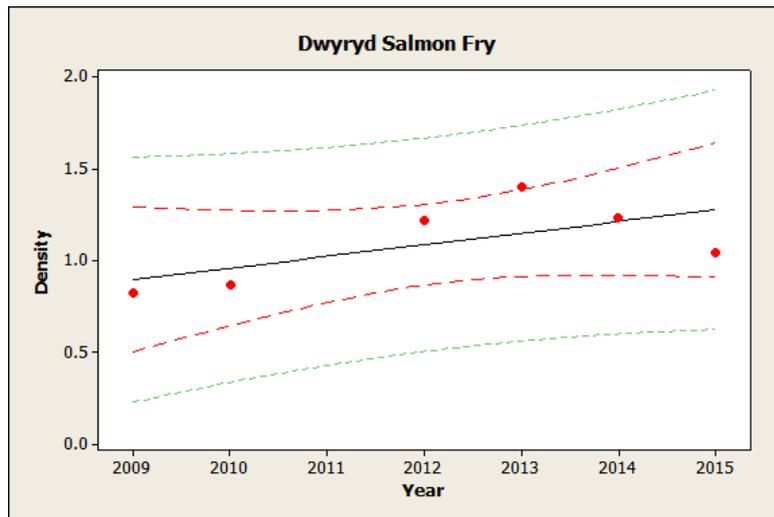


Juvenile Trend Analysis

Trends in the population data for juvenile salmon and trout were assessed using a Bayesian statistical model. The data was analysed using a linear model which fits a straight line to the data in order to determine whether a trend (upwards or downwards) is present in fish numbers over the timeframe. The statistical significance of the trend is denoted by the P value, $P > 0.975$ indicates a statistically significant upward trend, and $P < 0.025$ indicates a statistically significant downwards trend. This can also be considered as percentage chance, e.g. a 97.5% chance of an upward trend, or just a 2.5% chance of an upward trend (which is a statistically significant downwards trend).

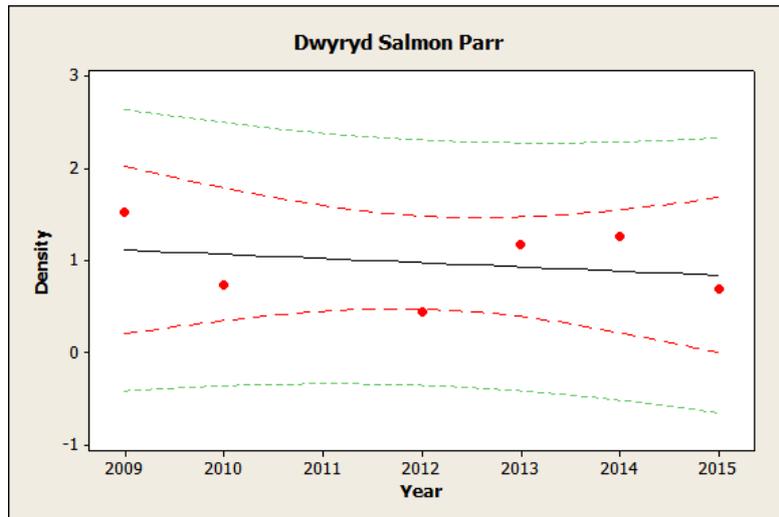
Data was analysed for the period 2009 to 2015 as the site has only been surveyed annually during this period. The figures below display trends in juvenile fish numbers over this period (note log scale).

Salmon Fry



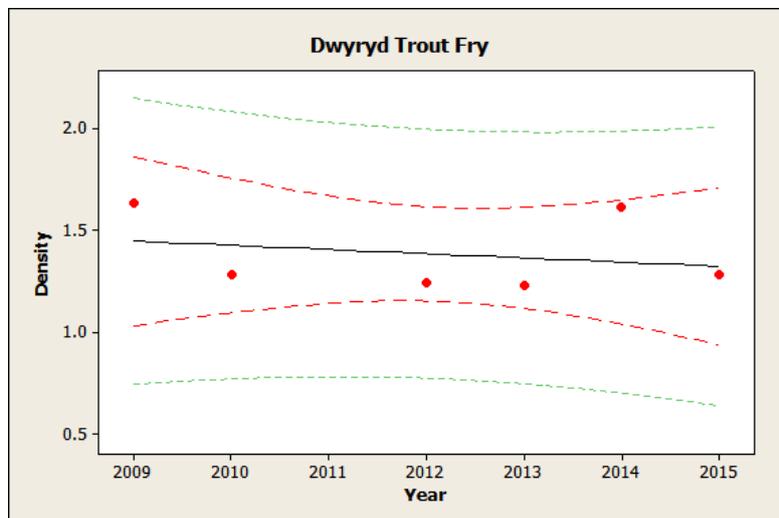
- Salmon fry densities on the Dwryd have shown an **increase** since 2009.
- This trend is **not statistically significant (P = 0.17)**.
- Salmon fry densities have improved however this is marginal due to the low numbers caught at the site. The habitat at the site is not perfect due to bedrock but this is an issue throughout the tributaries on the Dwryd. This improvement does not reflect the declining salmon rod catch on the Dwryd. Decreasing effort on the Dwryd may also be impacting on the rod catch. The 2013/14 seasons have seen some of the poorest salmon runs on record across the UK. This is believed to be due to sea survival. Poor feeding grounds have led to a large decline in the grilse run. The majority of returning salmon are now multi-sea winter fish.

Salmon parr



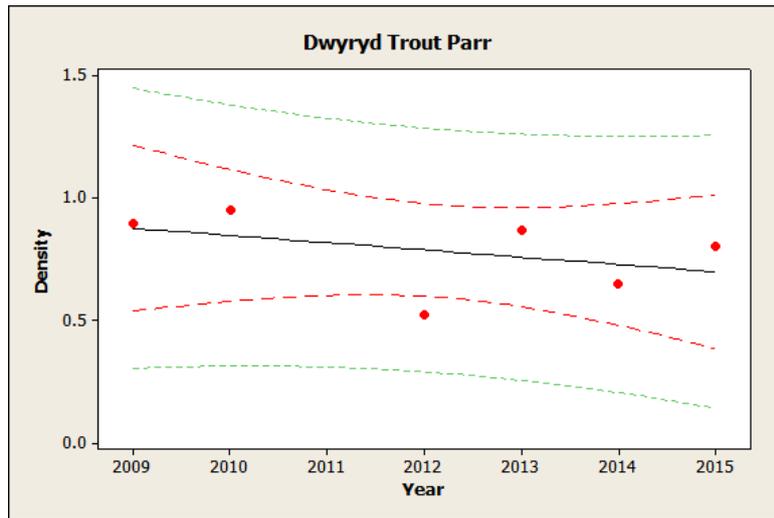
- Salmon parr densities on the Dwryrd have **declined** since 2009.
- This trend is **not statistically significant (P = 0.62)**.
- Salmon parr densities have varied year on year at the site. The site has good salmon parr habitat.

Trout fry



- Trout fry densities on the Dwryrd have **declined** since 2009.
- This trend is **not statistically significant (P = 0.63)**.
- Though there is a slight decline the site has generally remained consistent for Trout fry. Improvements in Trout fry densities have been seen in most North Wales River. Favourable local marine conditions are believed to be linked to these improvements.

Trout parr



- Trout parr densities on the Dwryyd have **declined** since 2009.
- This trend is **not statistically significant (P = 0.41)**.
- Trout parr densities at this site have always been low so the decline is marginal. The habitat is more suited to salmon parr than trout.

Dwryrd catchment summary

Fisheries Action - Dwryrd

Site	Action	Benefits	Lead	Partner(s)	Timescales for delivery
Dwryrd	Habitat improvements: We will investigate where there is opportunity to improve habitat for fish through improving access over barriers, restoration of riparian and instream habitat, including control of invasive species.	More natural river system, reduced siltation, increased flow diversity, improved spawning gravels and juvenile habitat. Improved fish numbers.	NRW		Ongoing
	Water Framework Directive: We will continue work to ensure no deterioration, monitor the status of the environment and investigate causes of failures. Together with our partners we will look to put in place measures that protect and improve the status of the water environment.	<ul style="list-style-type: none"> • Waterbodies protected and improved • WFD waterbodies achieving Good Status/Potential 	NRW	NRW Wildlife Trusts Local Authorities Landowners DCWW SNPA	Ongoing
	Enforcement: Action to reduce illegal activity on information provided and investigations	Reduced illegal activity, more fish remain in the system.	NRW	Stakeholders North Wales Police	Ongoing

Abbreviations

NRW – Natural Resources Wales

DCWW – Dwr Cymru Welsh Water

SNPA – Snowdonia National Park Association