

# Know Your River - Ogwen

## Salmon & Sea Trout Catchment Summary

### Introduction

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

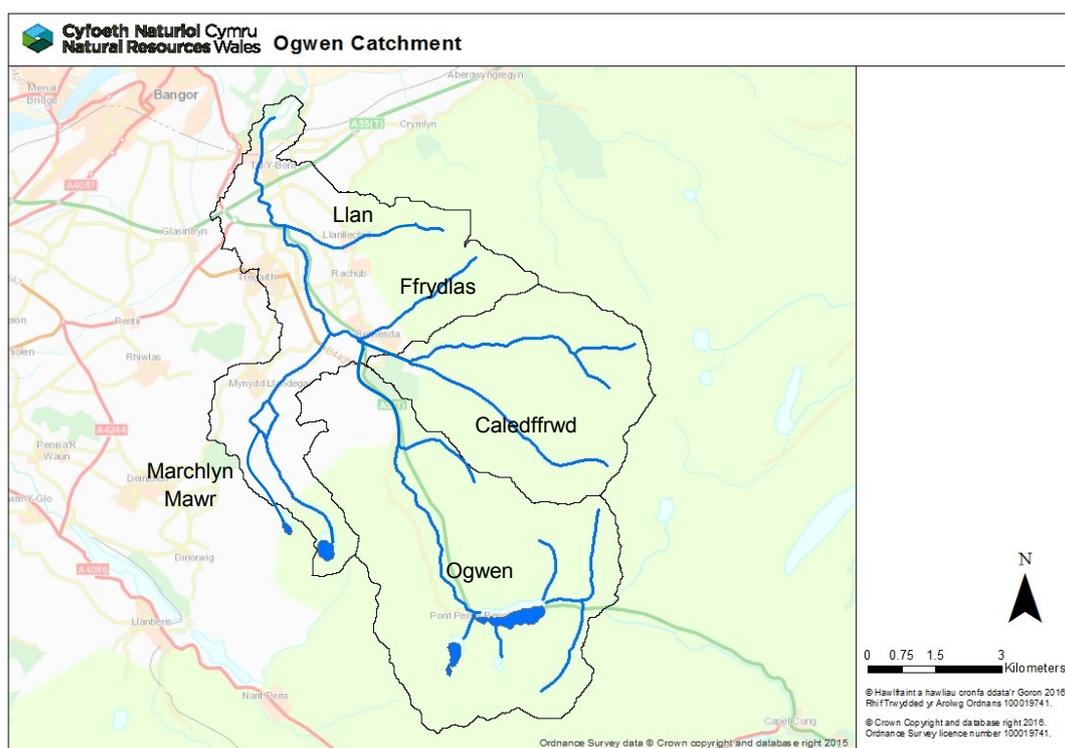
Action tables set out habitat improvements to restore freshwater productivity of salmon and sea trout populations. These tables also include some work which will be carried out by our partner organisations, not just Natural Resources Wales (NRW).

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 Afon Ogwen catchment extends from the uplands of the Carneddi range down to the Menai Straits east of Bangor. Migratory salmonids have access to most of the main Ogwen



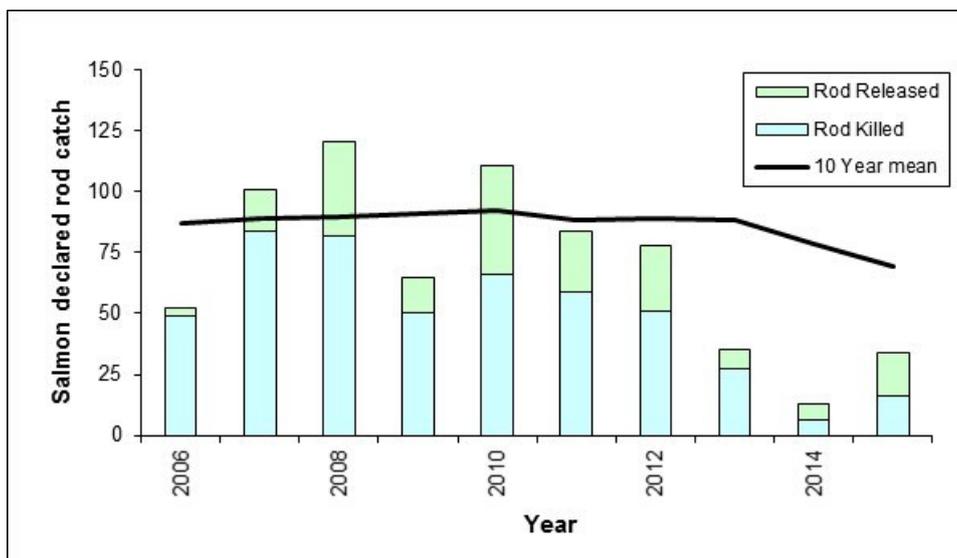
River, however the waterfall at the outlet of Llyn Ogwen is a natural barrier stopping access to the lake and upper tributaries. Access to the other tributaries is also limited by waterfalls.

Water quality on the catchment is good with acidic upland streams being buffered by the underlying calcareous bedrock. The land use is mainly agricultural and slate quarrying is the main industry present.

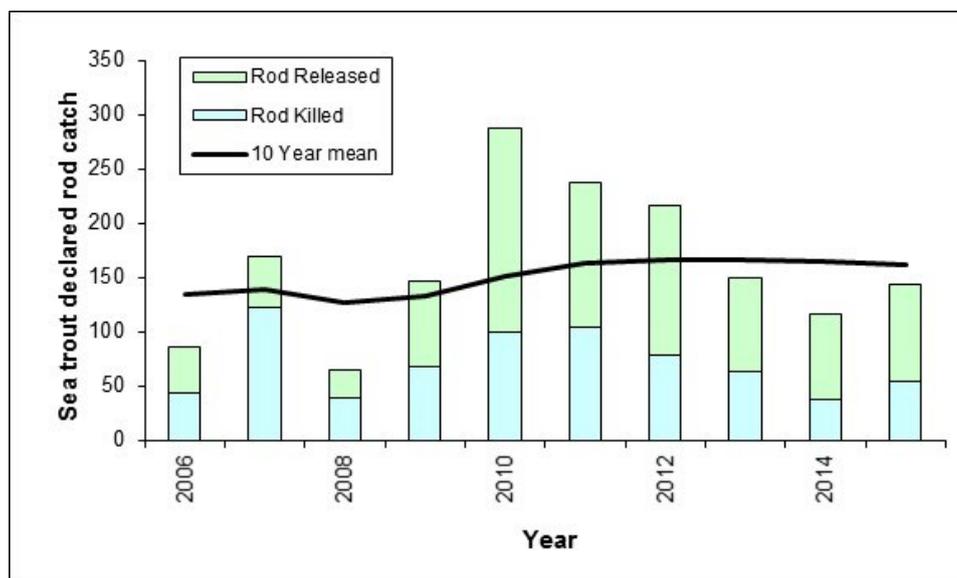
### Rod catches

The following graphs show the total declared rod catches for salmon and sea trout on the Ogwen.

**Salmon rod catch** – has declined since 2012. The release rate in 2015 is 53%. This is poor and needs to improve to conserve stocks. The North Wales average is 65%.



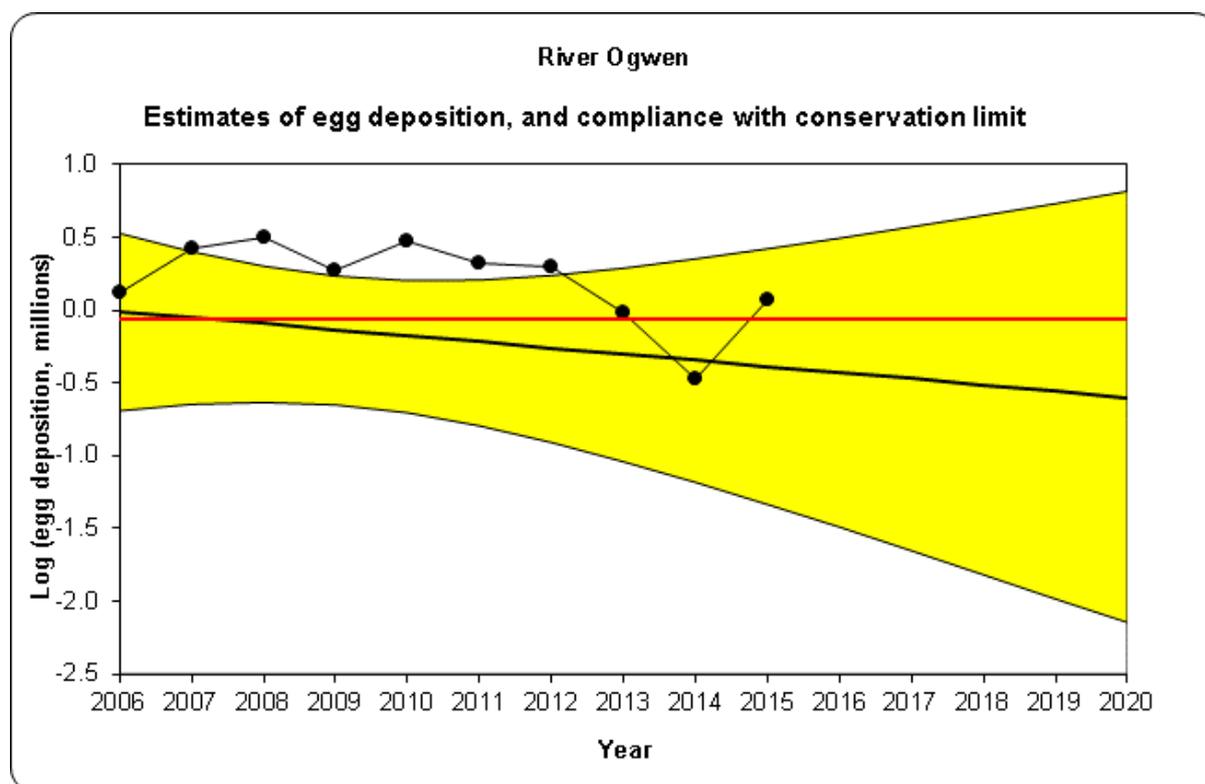
**Sea trout rod catch** – has remained consistent. The release rate in 2015 is 62%. This is poor and needs to improve to conserve stocks. The North Wales average is 72%.



## 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?

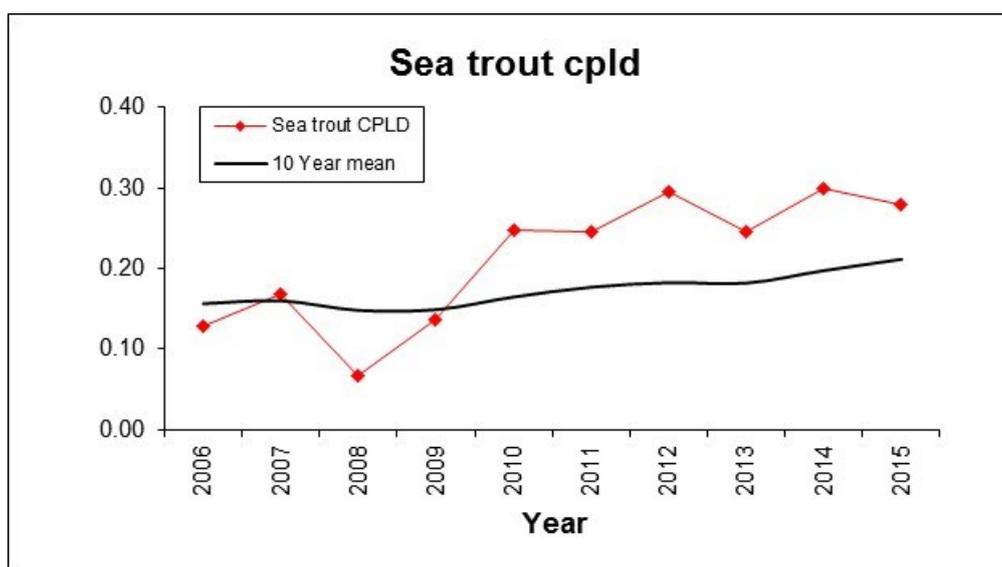
The red line represents the number of eggs required to be deposited to sustain a healthy salmon stock.

- 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 Ogwen is **improving** and this is a statistically significant trend
- Average CPLD for the most recent 3-year period is in the **upper (80%)** of the range of CPLD figures reported in the previous 10-years
- Combining the above measures, the Ogwen is classified as **“not at risk”**; i.e. the fishery appears to be performing well – indicating a healthy 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



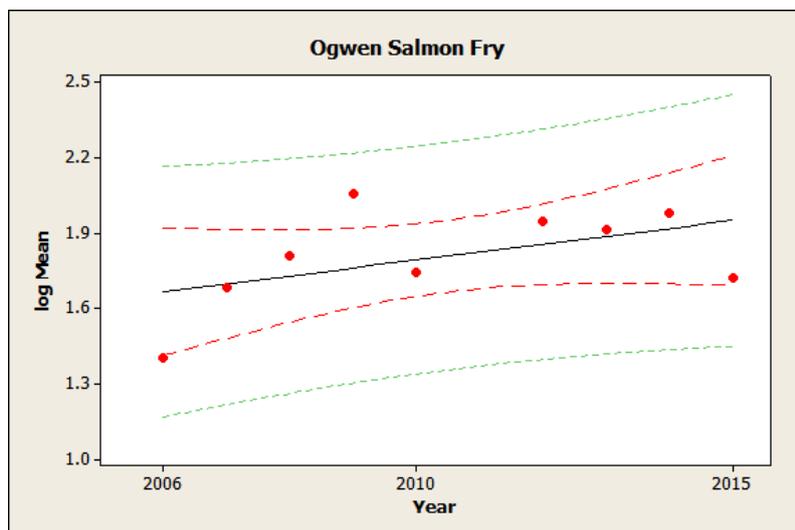
### Juvenile Trend Analysis

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%

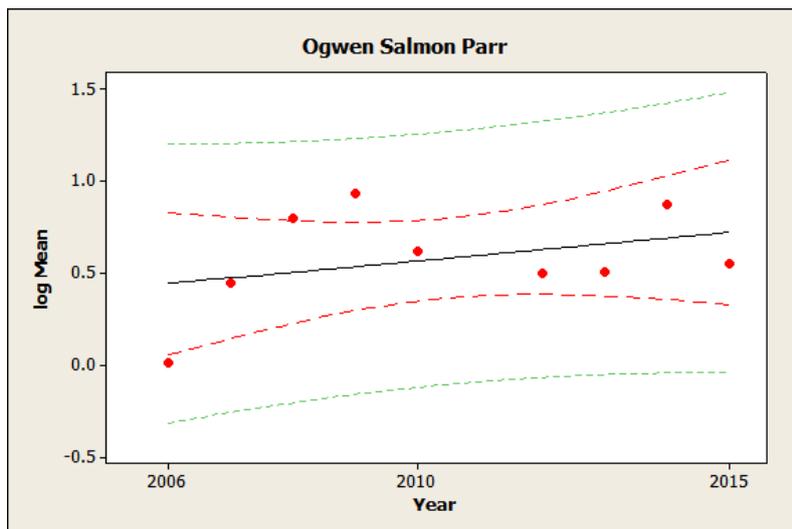
chance of an upward trend, or just a 2.5% chance of an upward trend (which is a statistically significant downwards trend).

Data was analysed for the period 2006 to 2015 for comparison against Salmon/Sea Trout conservation data. The figures below display trends in juvenile fish numbers over this period (note log scale).

### Salmon Fry

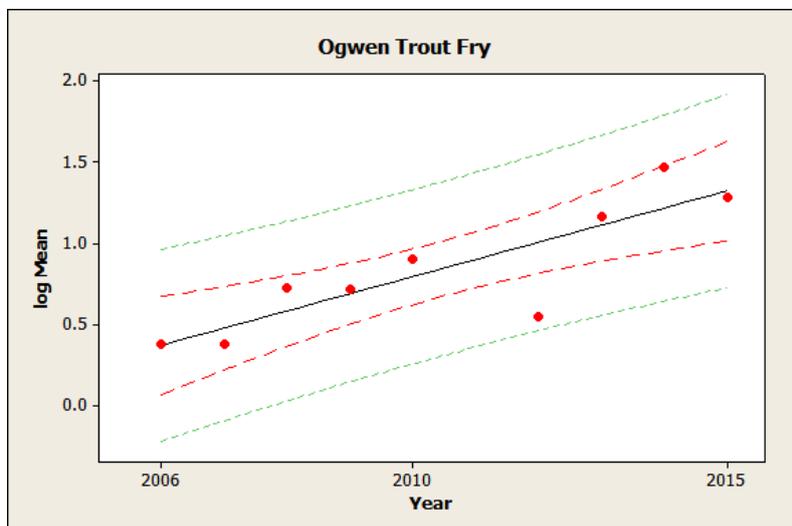


- Salmon fry densities on the Ogwen have **improved** since 2006.
- This trend is **not statistically significant (P = 0.16)**.
- Though the overall trend on the Ogwen is improvement, the salmon fry density in 2015 declined. This coincides with the poor rod catch in the 2014 season. The 2014 season produced 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.

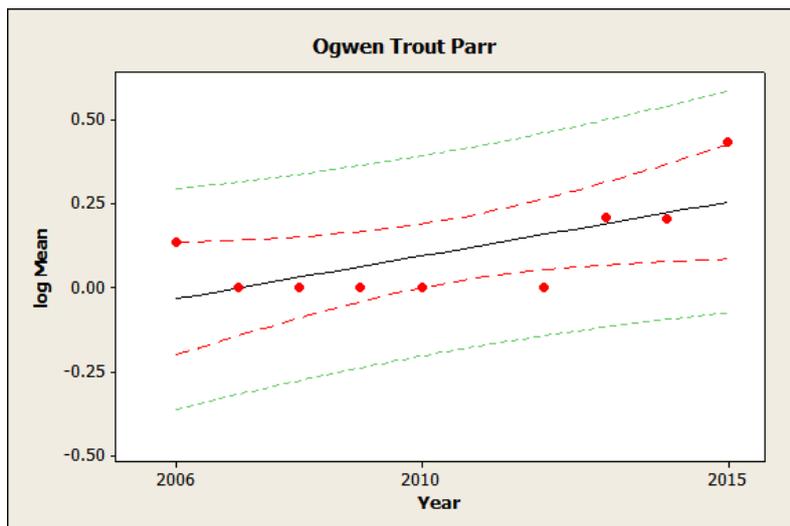


- Salmon parr densities on the Ogwen have **improved** since 2006.
- This trend is **not statistically significant (P = 0.34)**.
- The number of Salmon Parr caught at the Ogwen site has always been very low so this does not give us a good picture of what is occurring across the Ogwen catchment. The site is quite large so the catch efficiency of parr is lower than usual.

### Trout Fry



- Trout fry densities on the Ogwen have **improved** since 2006.
- This trend is **statistically significant (P = 0.01)**.
- The improvement on the Ogwen does not reflect the Sea Trout rod catch data, but is similar to what has been seen on most North Wales Rivers. Favourable local marine conditions are believed to be linked to these improvements.



- Trout parr densities on the Ogwen have **improved** since 2006.
- This trend is **statistically significant (P = 0.05)**.
- The number of Trout Parr caught at the Ogwen site has always been very low so this does not give us a good picture of what is occurring across the Ogwen catchment. The site is quite large so the catch efficiency of parr is lower than usual.

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### Fisheries Actions – Ogwen

Site	Action	Benefits	Lead	Partner(s)	Timescales for delivery
Ogwen	<b>Habitat improvements:</b> We will investigate where there is opportunity to improve habitat for fish through restoration of riparian and instream habitat	More natural river system, reduced siltation, increased flow diversity, improved spawning gravels and juvenile habitat. Improved fish numbers.	NRW		Ongoing
	<b>Barriers to be addressed:</b> <ul style="list-style-type: none"> <li>• Investigation of other barriers to improve fish passage</li> <li>• Maintenance of Ogwen bank fish pass</li> </ul>	<ul style="list-style-type: none"> <li>• Improved knowledge of barriers to improve access for salmon and trout to spawning areas upstream.</li> <li>• Improved access to spawning areas and habitat upstream.</li> </ul>	NRW Landowner		Ongoing 2016/17
	<b>Water Framework Directive:</b> 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"> <li>• Water bodies protected and improved</li> <li>• WFD waterbodies achieving Good Status/Potential</li> </ul>	NRW	NRW Wildlife Trusts Local Authorities Landowners SNPA	Ongoing
	<b>Enforcement:</b> 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

SNPA – Snowdonia National Park Association