

Know Your River – Conwy

Salmon & Sea Trout Catchment Summary

Introduction

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

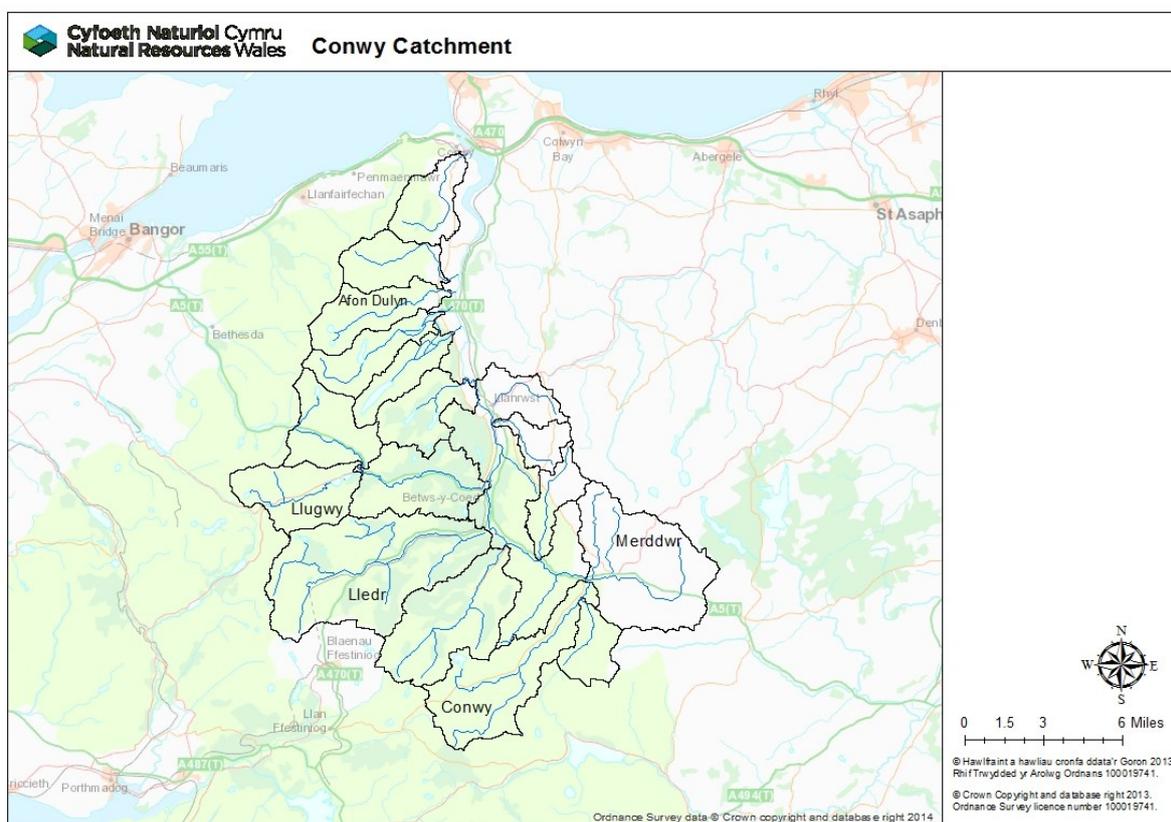
Action tables set out habitat improvements to restore freshwater productivity of salmon and sea trout populations. These tables also include some work which will be carried out by our partner organisations, not just Natural Resources Wales (NRW).

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 Conwy rises from Llyn Conwy in the Migneint Moors in Snowdonia, and drains a predominantly upland catchment discharging into Liverpool Bay at Conwy. The catchment is mainly rural with limited industrial development. Land use is dominated by agriculture (75%),



mainly sheep grazing with some dairy farming, and coniferous afforestation (12%). Tourism also plays an important role in the local economy.

The 'hard' Ordovician rocks in the south and west areas of the catchment have given rise to thin, poorly buffered soils that are susceptible to the effects of acidification. The weather resistance of these rocks has also given rise to steep slopes that have rendered most of the subcatchments in the south-western area inaccessible to migratory fish. In contrast, the geology of the north-eastern area of the catchment provides more buffering which reduces acid sensitivity.

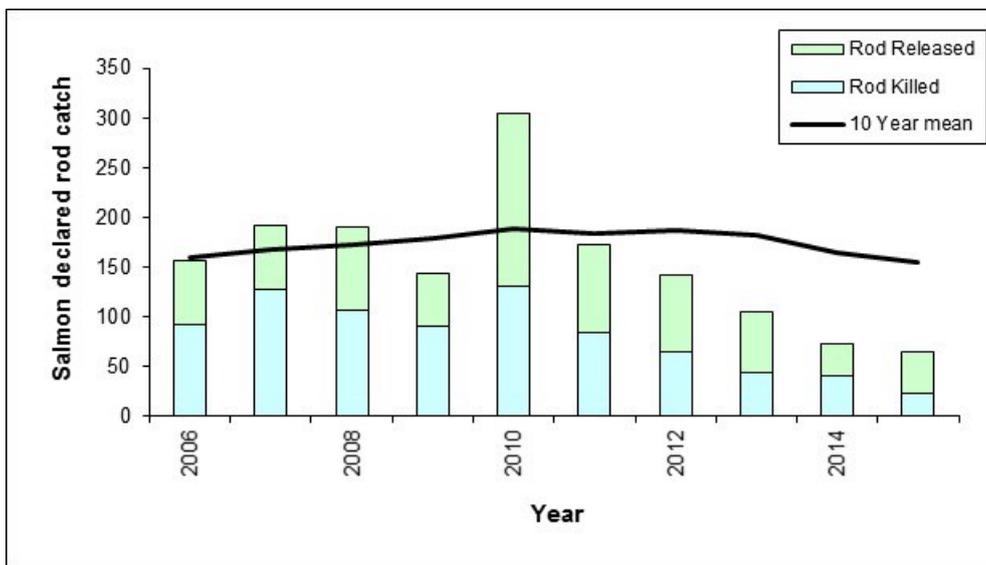
Abandoned metal mine shafts, adits and spoil heaps act as point sources of metal contamination in parts of the Gwydyr forest just north of Betws y Coed. This contamination has a localised impact upon the Nant Gwydyr and minor tributaries of the lower Llugwy.

The Conwy falls fish pass was constructed in compensation for any disturbance to the Conwy's fisheries during the construction of the A55 expressway tunnel at Conwy. This was opened in 1994 and opened an additional 40% of spawning and nursery area within the catchment.

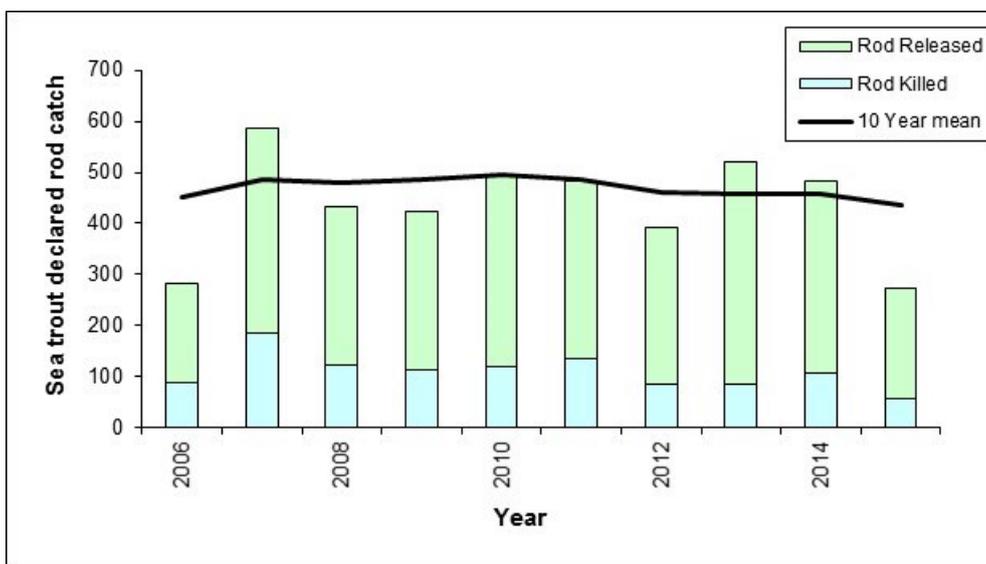
Rod catches

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

Salmon rod catch – has continued to decline since 2010. The release rate in 2015 was 66%. This needs to improve to conserve stocks. The North Wales average is 65%.



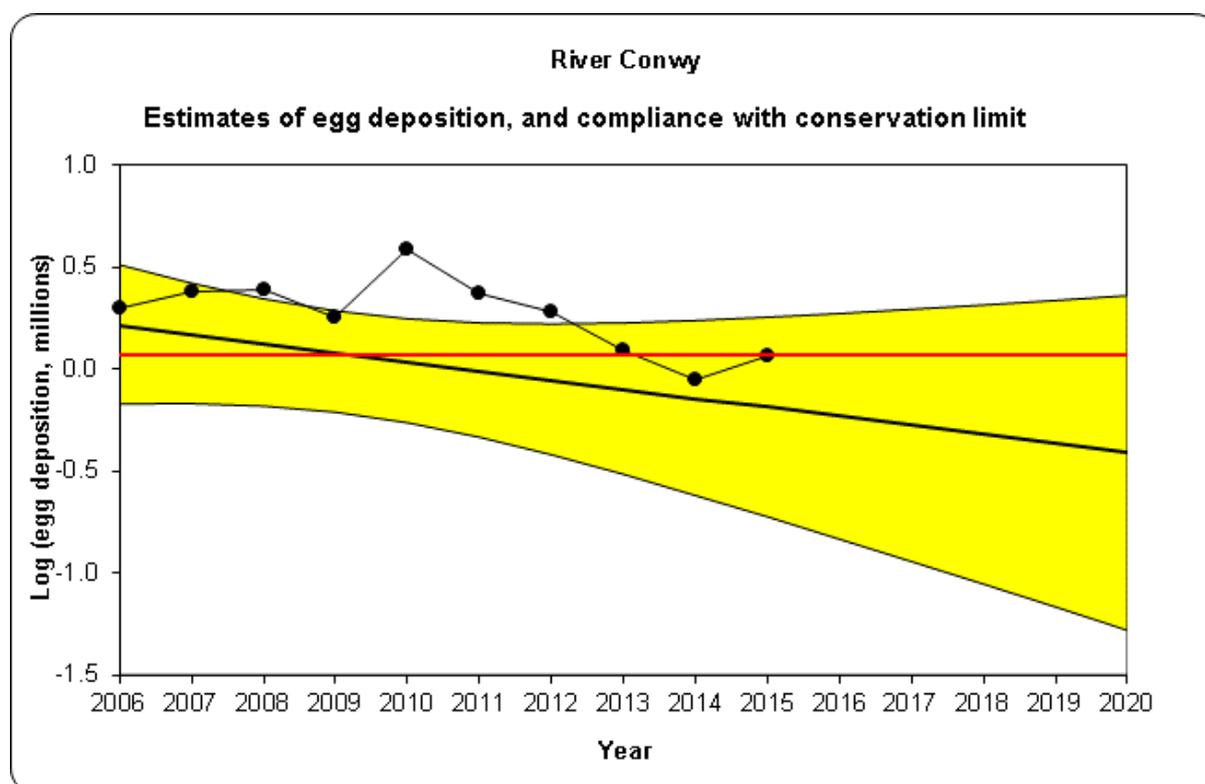
Sea trout rod catch – has declined in 2015. The release rate in 2015 was 79%. This is just above the average for North Wales and needs to be maintained. The North Wales average is 72%.



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?

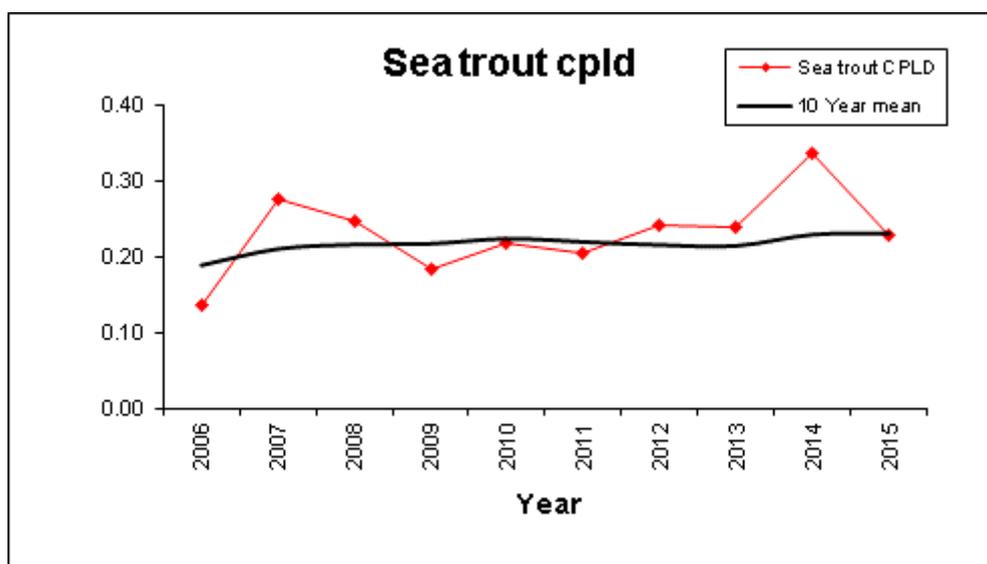
The red line represents the number of eggs required to be deposited to sustain a healthy salmon stock.

- 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 Conwy 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 Conwy 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

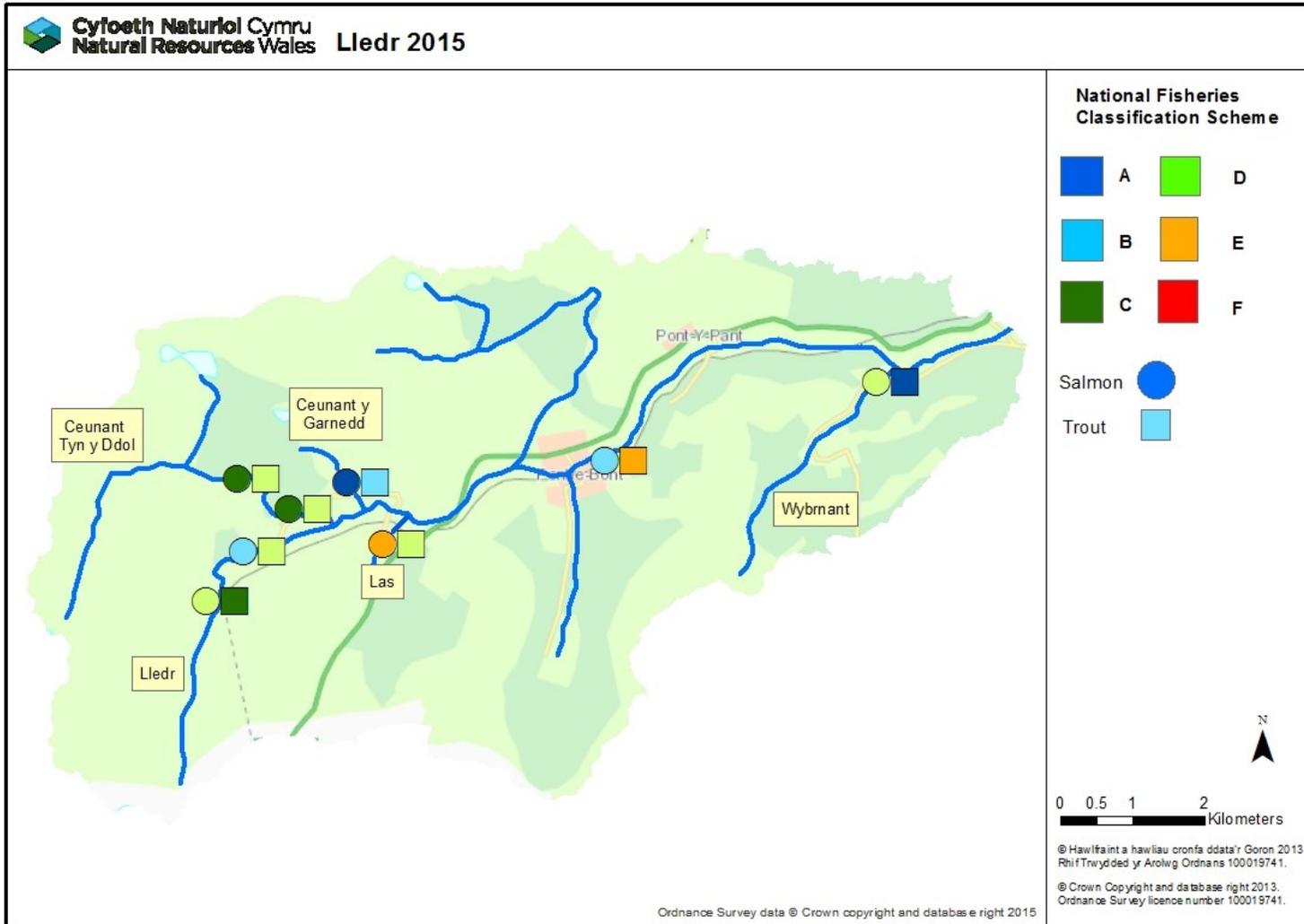
Juvenile Monitoring

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 Monitoring

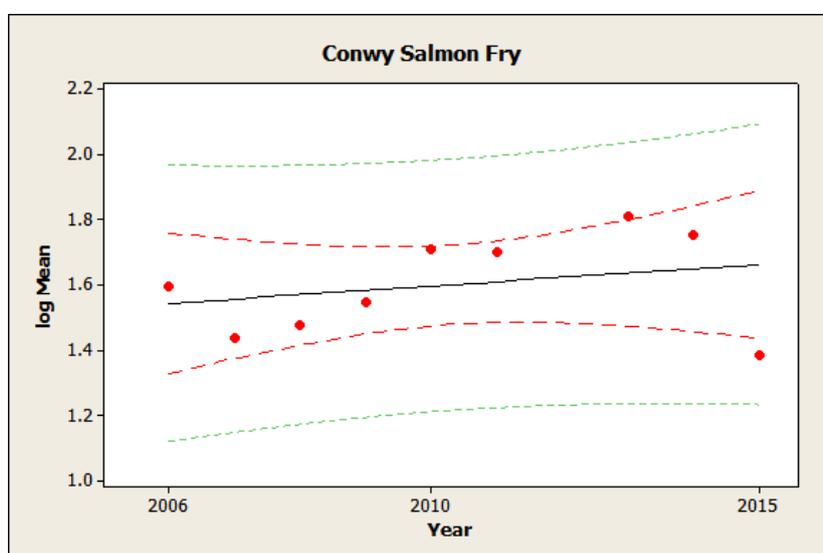


Juvenile Trend Analysis

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).

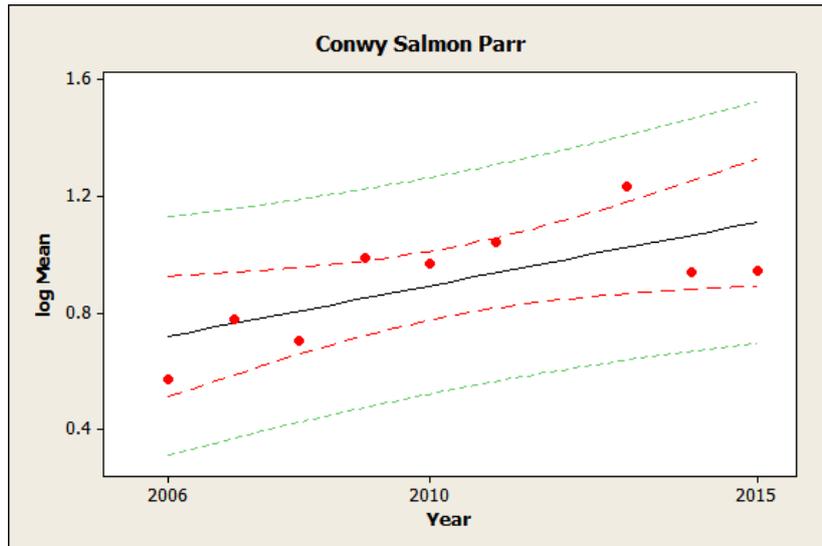
Data was analysed for the period 2006 to 2015 for comparison against Salmon/Sea Trout conservation data. The figures below display trends in juvenile fish numbers over this period.

Salmon fry



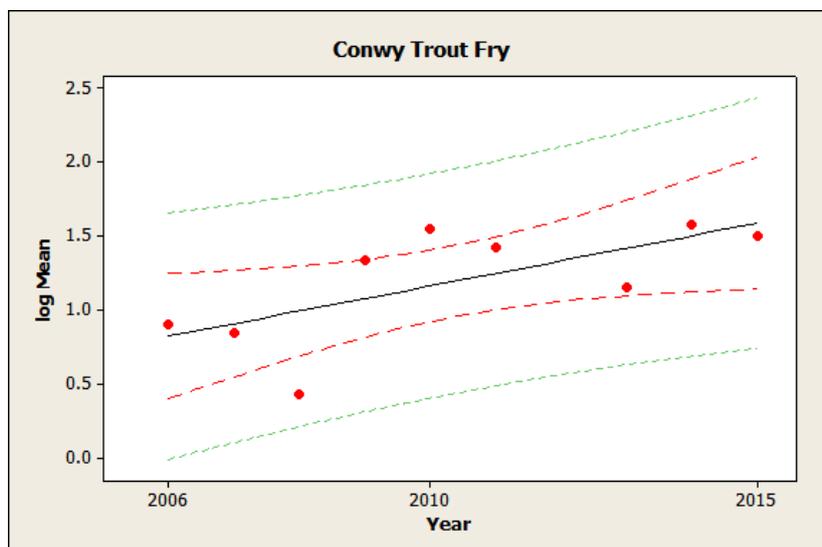
- Salmon fry densities on the Conwy have **improved** since 2006.
- This trend is **not statistically significant (P = 0.47)**.
- Though the overall trend is improving 2015 looks exceptionally poor on the graph. This is due to zero salmon fry being caught on the Roe. The other annual sites (Nant y Goron, Lledr & Merddwr) remained consistent. The Salmon rod catch on the Conwy is declining. The 2014 season gave some of the poorest salmon runs on record. 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



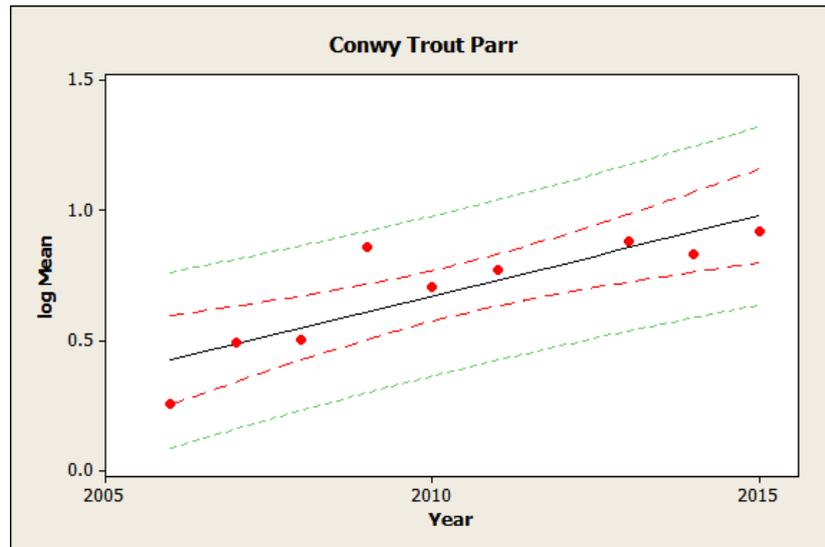
- Salmon parr densities on the Conwy have **improved** since 2006.
- This trend is **not statistically significant (P = 0.04)**.
- Though there is a significant improvement in Salmon parr density we have seen a decline in 2014/15. Again this is mainly caused by low numbers in the Roe compared to previous years.

Trout fry



- Trout fry densities on the Conwy have **improved** since 2006.
- This trend is **not statistically significant (P = 0.04)**.
- The main improvements have been seen on the Nant y Goron; other annual sites have remained consistent. Sea Trout rod catch has also remained consistent on the Conwy. Many rivers in North Wales have seen improved Sea Trout rod catch. Favourable local marine conditions are believed to be linked to these improvements.

Trout parr



- Trout parr densities on the Conwy have **improved** since 2006.
- This trend is **statistically significant (P = 0.01)**.
- Trout parr improvements have been seen on all of the annual sites across the Conwy catchment.

Fisheries Actions - Conwy

Site	Action	Benefits	Lead	Partner(s)	Timescales for delivery
Conwy	Barriers to be addressed: <ul style="list-style-type: none"> • Maintenance of Conwy Falls Fish pass • Investigation of barriers on the catchment to improve fish passage 	<ul style="list-style-type: none"> • Improved knowledge of barriers to improve access for fish, including salmon and trout to spawning areas upstream. • Access maintained to spawning areas and habitat upstream. • Improved fish numbers and increased diversity of fish populations - increased resilience. 	NRW	CCGRT	Ongoing
	Habitat improvements: We will investigate where there is opportunity to improve habitat for fish through restoration of riparian and instream habitat. Including invasive species.	More natural river system, reduced siltation, increased flow diversity, improved spawning gravels and juvenile habitat. Improved fish numbers.	NRW	CCGRT	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 CCGRT Wildlife Trusts Local Authorities Landowners DCWW	Ongoing
	Improvements in phosphorus discharge in 1 water body (Hiraethlyn)	Required standard in phosphorus is achieved	DCWW	NRW	2020
	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

CCGRT – Clwyd, Conwy & Gwynedd Rivers Trust