

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.

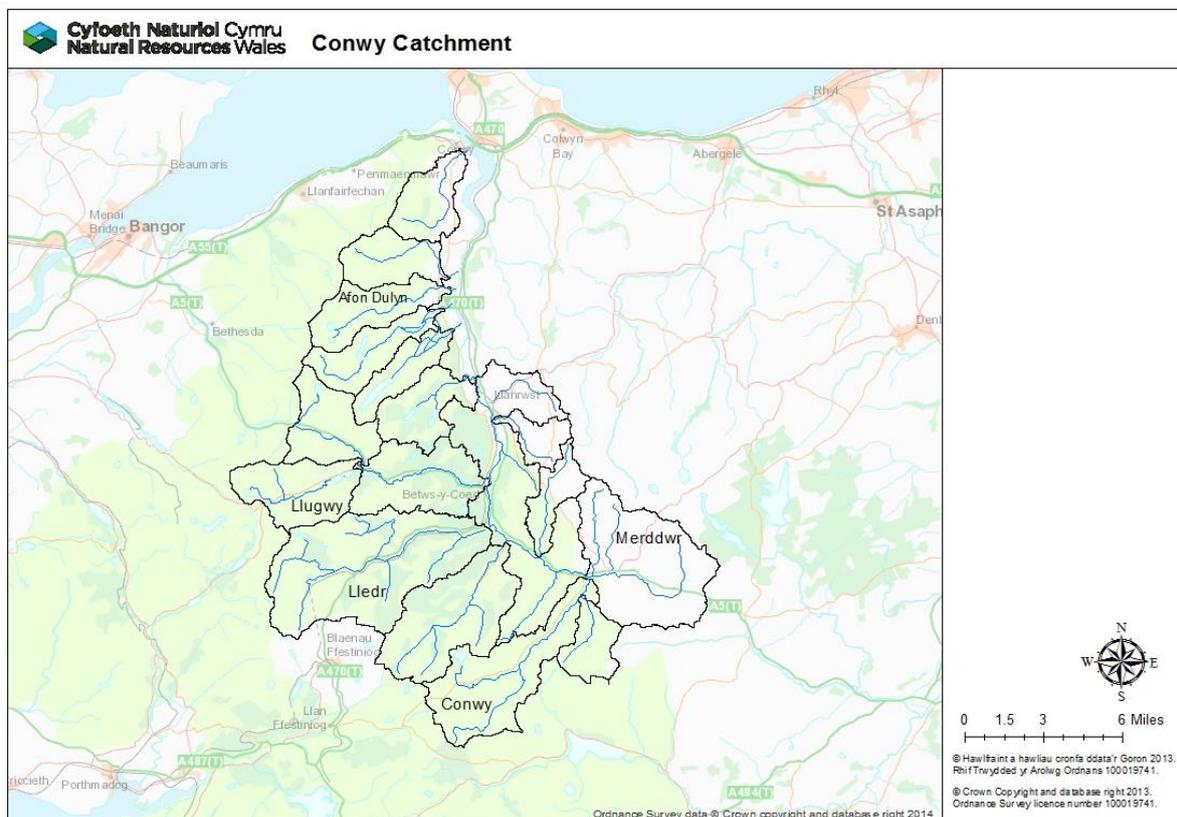
Action tables set out habitat improvements to restore freshwater productivity of salmon and sea trout populations. These tables also include some work which will be carried out by our partner organisations, not just Natural Resources Wales (NRW).

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 principal salmon rivers where, in the past, Salmon Action Plans have been produced, and/or, in SAC rivers, where condition assessments have been undertaken under the Habitats Directive. In addition, the status of various fish species in all our rivers is reported as part of Water Framework Directive (WFD) assessments. This report refers to these commitments. Its purpose is to provide, for our customers, an informative and useful summary of stock status and remedial work planned - specifically for anglers, fishery and land owners; as well as other 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 sub catchments 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.

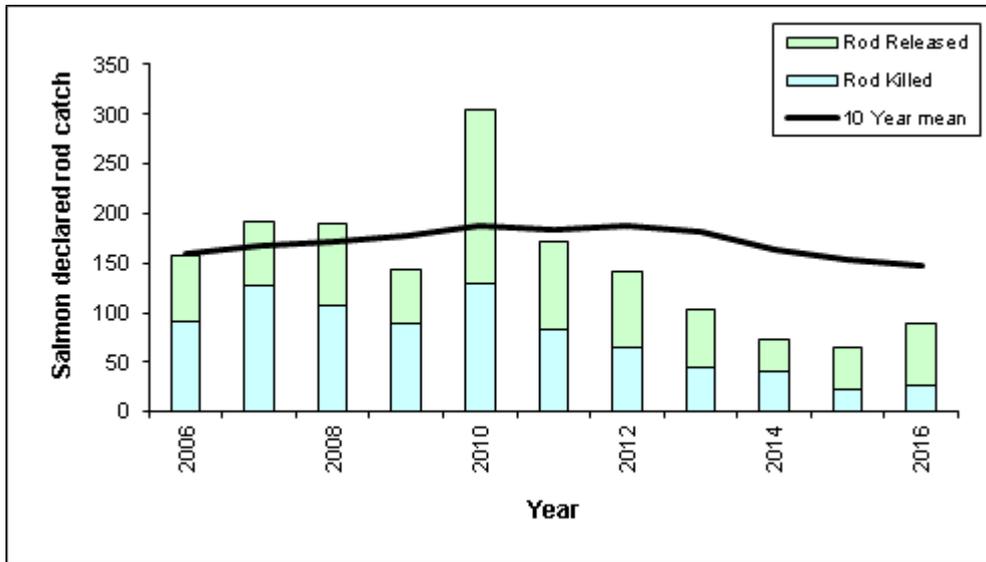
The Conwy falls fish pass was constructed in compensation for any disturbance to the Conwy's fisheries during the construction of the A55 expressway tunnel at Conwy. This was opened in 1994 and opened an additional 40% of spawning and nursery area within the catchment.



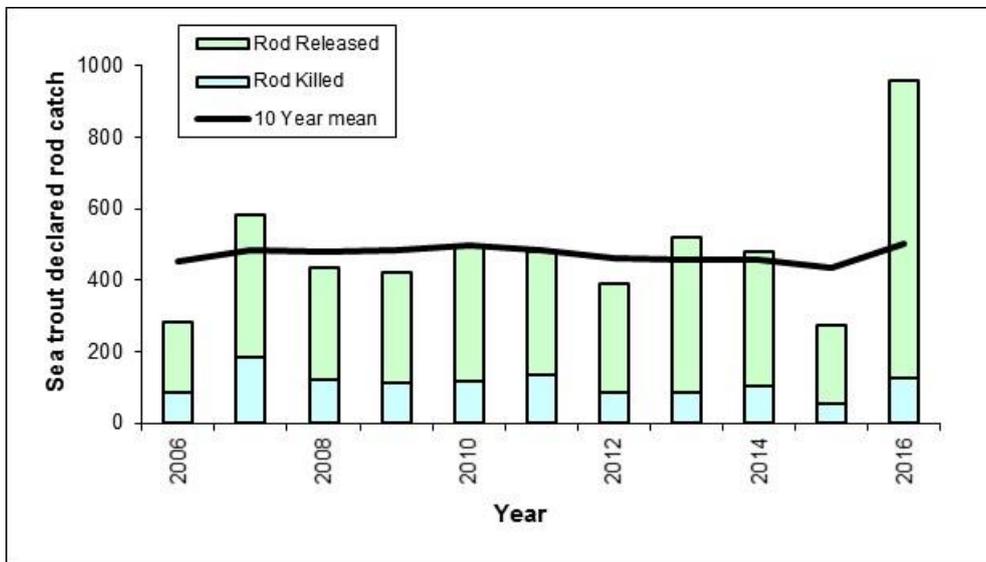
Rod catches

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

Salmon rod catch – has improved slightly following the decline since 2010. The release rate in 2016 was 71%. This could do with improving. The North Wales average is 62%.



Sea trout rod catch – was by far the best in 10 years. The release rate in 2016 was 87%. This is an excellent result and needs to be maintained. The North Wales average is 79%.

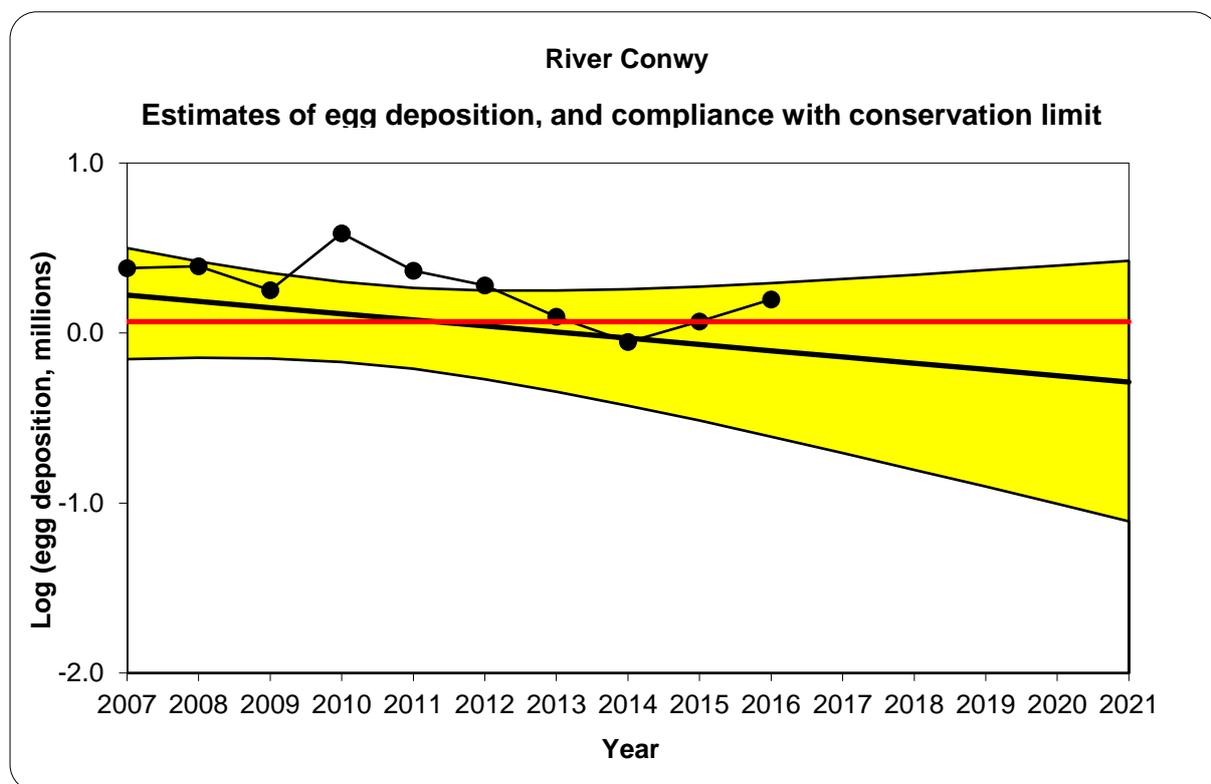


Stock status

Conservation of Salmon

Salmon stock status is assessed using 'Conservation Limits' which provide an objective reference point against which to assess the status of salmon stocks in individual rivers.

This is calculated by applying assumed angling exploitation rates to catch data to derive run estimates; adopting standard sex ratios and weight-fecundity relationships to generate egg deposition figures. 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. Therefore, 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 conservation limit seeks to protect. The conservation limit represents the number of eggs that must be deposited each year within a given catchment to conserve salmon stocks in the future.



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

The red line represents the number of eggs required to be deposited to sustain a healthy salmon stock. The black trend line and its confidence limits (the yellow band) is fitted to the most recent 10-year series of egg deposition estimates (2007-2016).

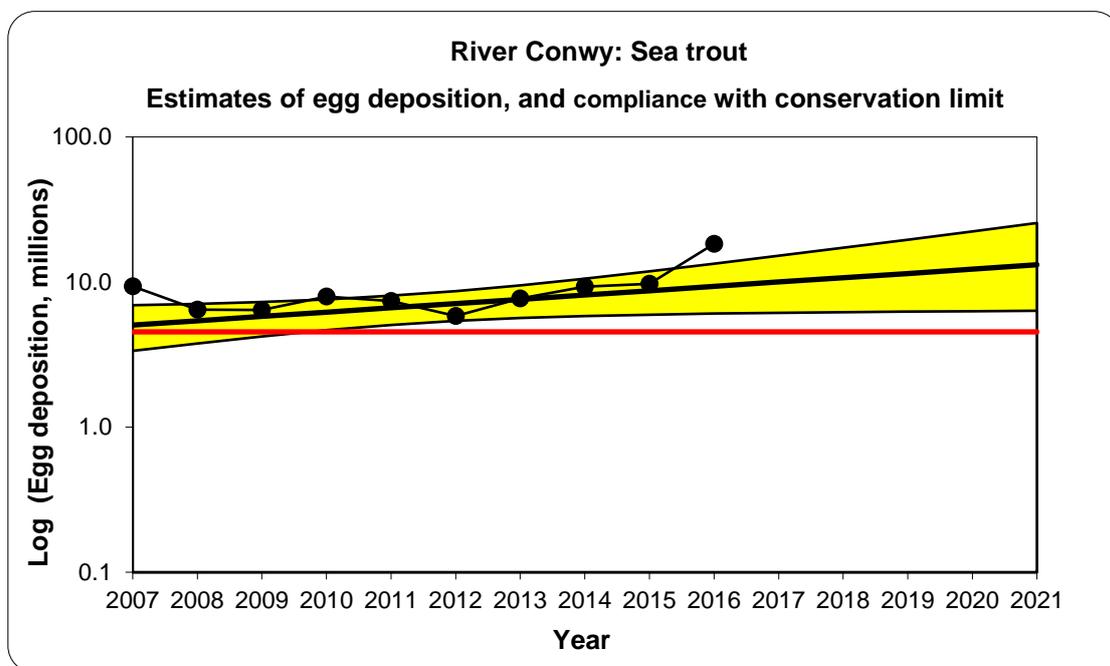
- Current number of eggs being deposited puts stocks **probably at risk**
- In 5 years' time the predicted status of salmon stocks will be **probably at risk**
- Based on current data, and the projection of the graph, the stocks of salmon on the Conwy will continue to **decline (uncertain)**

Conservation of Sea Trout

In contrast to salmon, no established methods of setting Conservation Limits or similar have been available for sea trout. In the absence of such analysis, NRW and the Environment Agency have, for several years, routinely applied a fishery based assessment to the principal sea trout rivers. This method – used previously in this report - utilises time-series' of angling catch per unit effort (CPUE) data ('catch per day') to examine sea trout performance on a river-by-river basis.

Recently an alternative stock-based assessment method has been developed by NRW and is applied here. This utilises angling catch data to derive run and egg deposition estimates for sea trout in much the same way that similar data sets are used in Conservation Limit compliance procedures for salmon assessment.

Further details on this method are given in the recent Technical Case supporting net and rod fishery byelaw proposals on all rivers in Wales and the cross-border rivers Wye and Dee (see: <http://naturalresourceswales.gov.uk/media/682258/technical-case-structure-final.pdf>)



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

The red line represents the number of eggs required to be deposited to sustain a healthy sea trout stock. The black trend line and its confidence limits (the yellow band) is fitted to the most recent 10-year series of egg deposition estimates (2007-2016).

- Current number of eggs being deposited puts stocks **not at risk**
- In 5 years' time the predicted status of salmon stocks will be **not at risk**
- Based on current data, and the projection of the graph, sea trout stocks will continue to **improve** on the Conwy

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

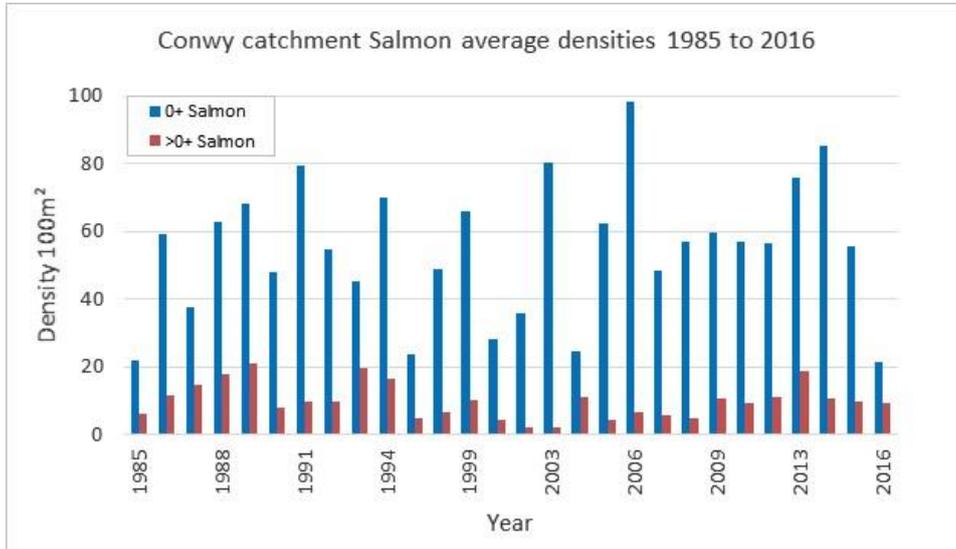




Juvenile Trend Analysis

Statistical analysis of the juvenile monitoring programme is currently being reviewed. The graphs below are catchment averages for salmon and trout from 1985 to 2016.

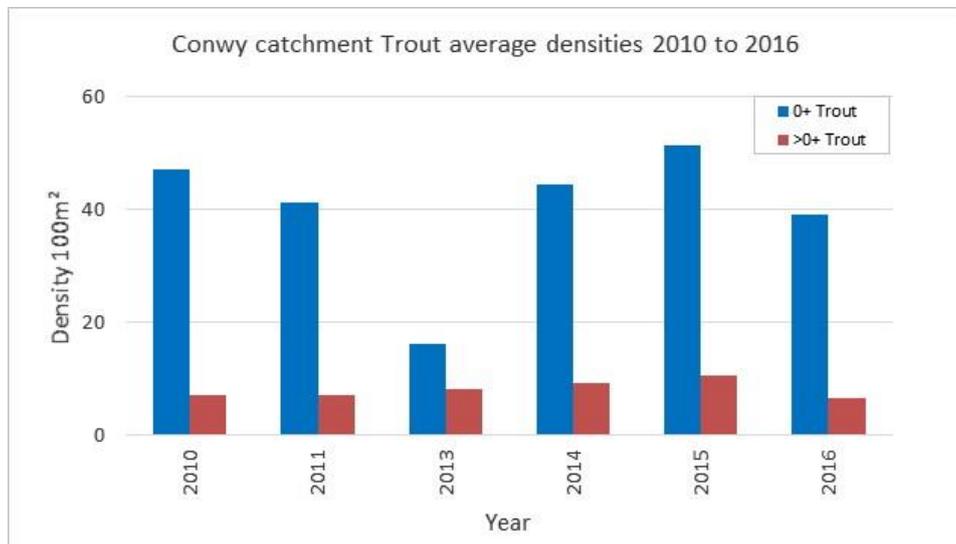
Salmon



Salmon fry and parr densities have fluctuated since monitoring began in 1985, however densities have been consistent between 2005 and 2015. There has been a large decline in salmon fry densities in 2016 across the catchment, however parr have remained consistent.

Juvenile salmon densities across Wales in 2016 have been poor, with some catchments showing significant absences of salmon fry. Though declining spawning stock will have lowered recruitment, it was felt that the extremely high flows and unseasonably warm temperatures throughout Nov/Dec/Jan will have adversely affected spawning.

Trout



Due to alterations in the monitoring programme the data is only comparable from 2010 onwards.

Trout fry density across the catchment has been consistent since 2010, with a dip in 2013. However, there is much variation across the catchment compared to the salmon results. The Roe recorded its highest trout fry densities on record in 2016. The Lledr also saw a slight improvement and remains at a good level compared to historic data. The Nant y Goron declined compared to 2015, with densities at lower levels compared to historic data. The Merddwr saw exceptionally poor trout fry numbers in 2016, and no trout parr were caught at the site. Though the site has changed there is good habitat for trout fry and parr. Slight declines for trout parr were seen on the Roe, Nant y Goron & Lledr.

Sea trout rod catch in 2015 had declined compared to previous years with the lowest rod catch of the past ten-year period. This would have had some effect on the recruitment. Flows were also exceptionally high on several of these rivers around the spawning period which will have further hindered spawning. The Oaklands stream, which is 2km upstream of Nant y Goron, was severely altered by the flows. Temperatures were also higher than normal during December.

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