Know Your River - Clwyd

Salmon & Sea Trout Catchment Summary

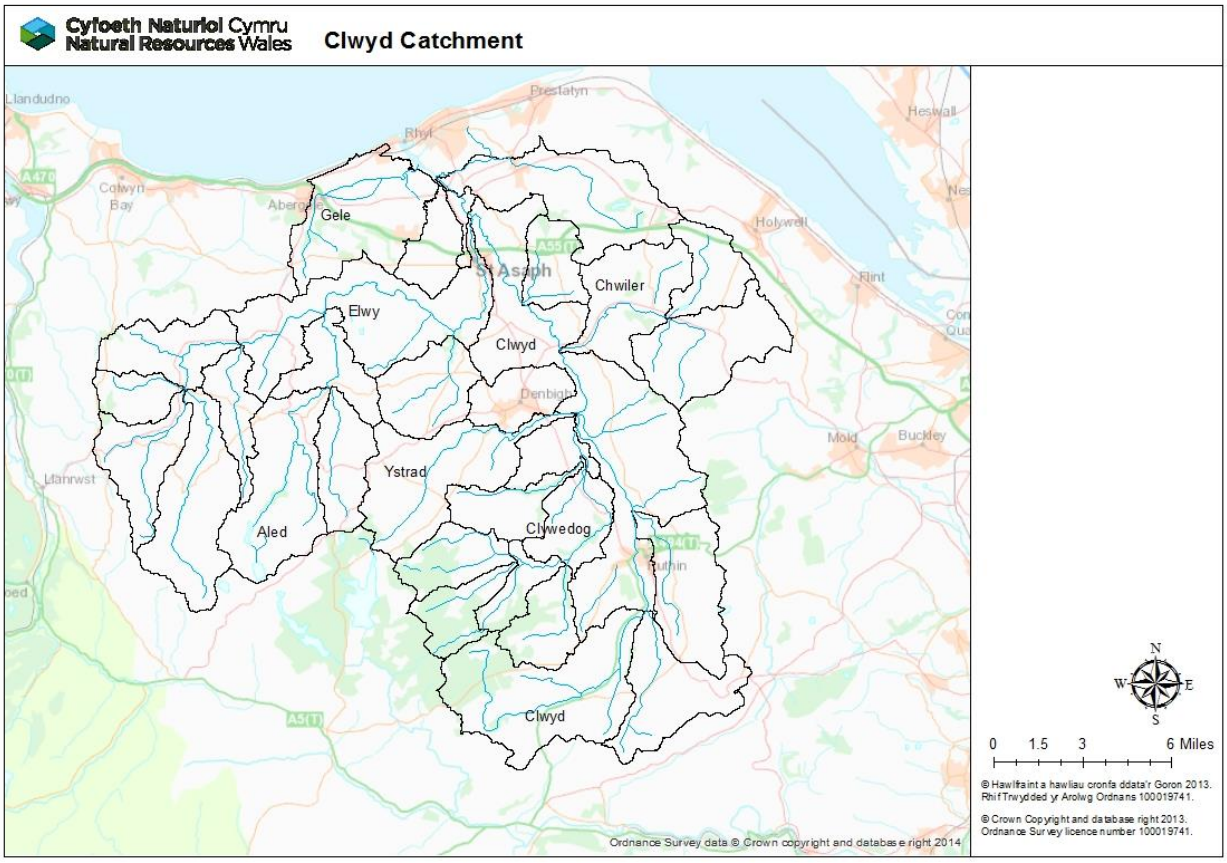
Introduction

This report describes the status of the salmon and sea trout populations in the Clwyd catchment. Bringing together data from rod catches, adult 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 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 Clwyd catchment can be split into two sub-catchments, the Clwyd and the Elwy. The Clwyd drains from the Clocaenog Forest and is slow moving and meandering for part of its length. The Elwy, which has its source to the West of the Denbigh Moors above Gwytherin, is an extremely flashy river having high run-off during times of heavy rain and suffers extreme low flows during dry periods.

Agriculture is the predominant land use with intensive arable and dairy farming in the fertile lowlands of the Vale of Clwyd, and mixed sheep and beef farming in the less fertile upland reaches of the catchment to the west.There are a number of afforested areas, the largest being the Clocaenog Forest at the headwaters. There is some industrial development consisting primarily of quarrying activities and there are a few fish farms.

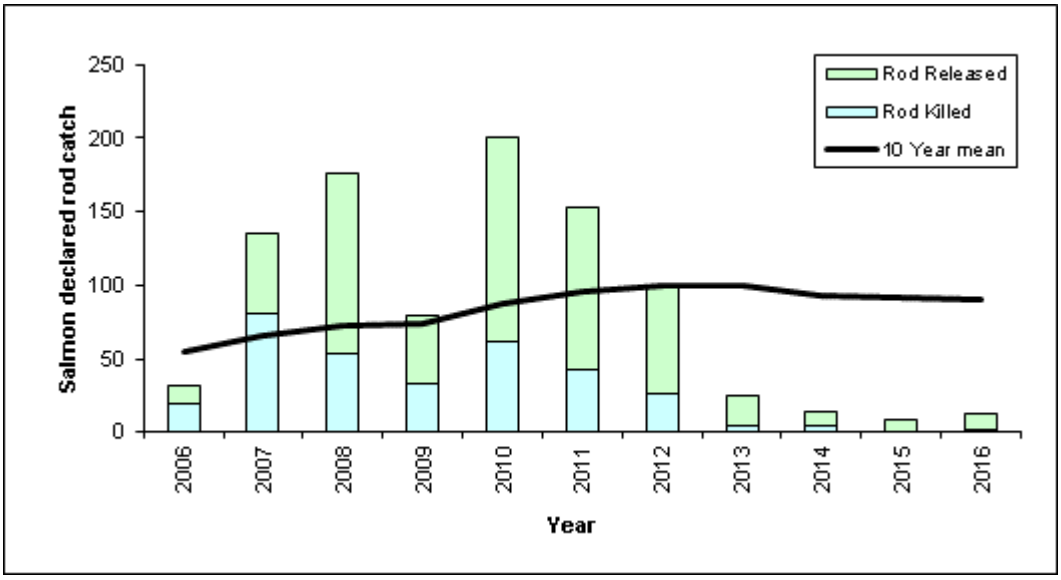
Acidification occurs in the naturally peaty uplands of the Clwyd, Clywedog and Aled systems. However, the abundance of Carboniferous limestone provides adequate buffering which progressively reduces the effects downstream.

Abstraction for public water supply has developed across the area to meet the rising demands over the last 100 years or so. For the most part water is supplied from high level sources e.g. Llyn Aled, Llyn Aled Isaf, Plas Uchaf and Dolwen. Rhyl and Prestatyn rely heavily on groundwater resources. Rhyl receives a significant proportion of its water supply from boreholes adjacent to Afon Clwyd at Llannerch Park. The Afon Clwyd is supported, at times of naturally low flows by pumped groundwater. This scheme began in the 1970s and is known as the ‘Clwyd Augmentation Scheme’.

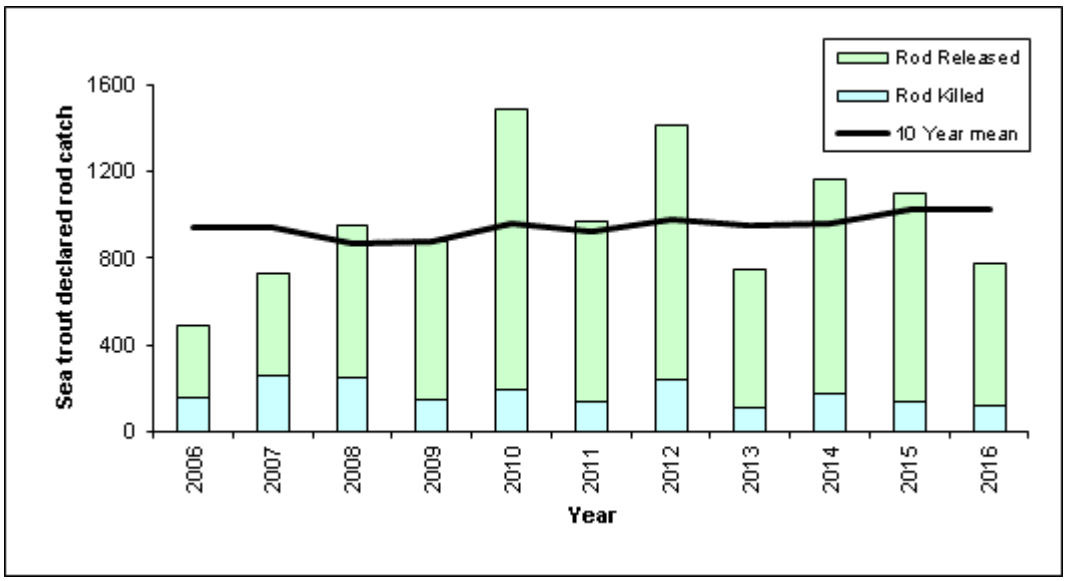
Rod catches

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

Salmon rod catch – has been exceptionally poor in the last 4 years. The release rate in 2016 was 83%. This is good but not as good as last year when it was an excellent 100%. The North Wales average is 62%.



Sea trout rod catch – has remained consistent. The release rate in 2016 was 85%. This is excellent and will hopefully continue. The North Wales average is 79%.

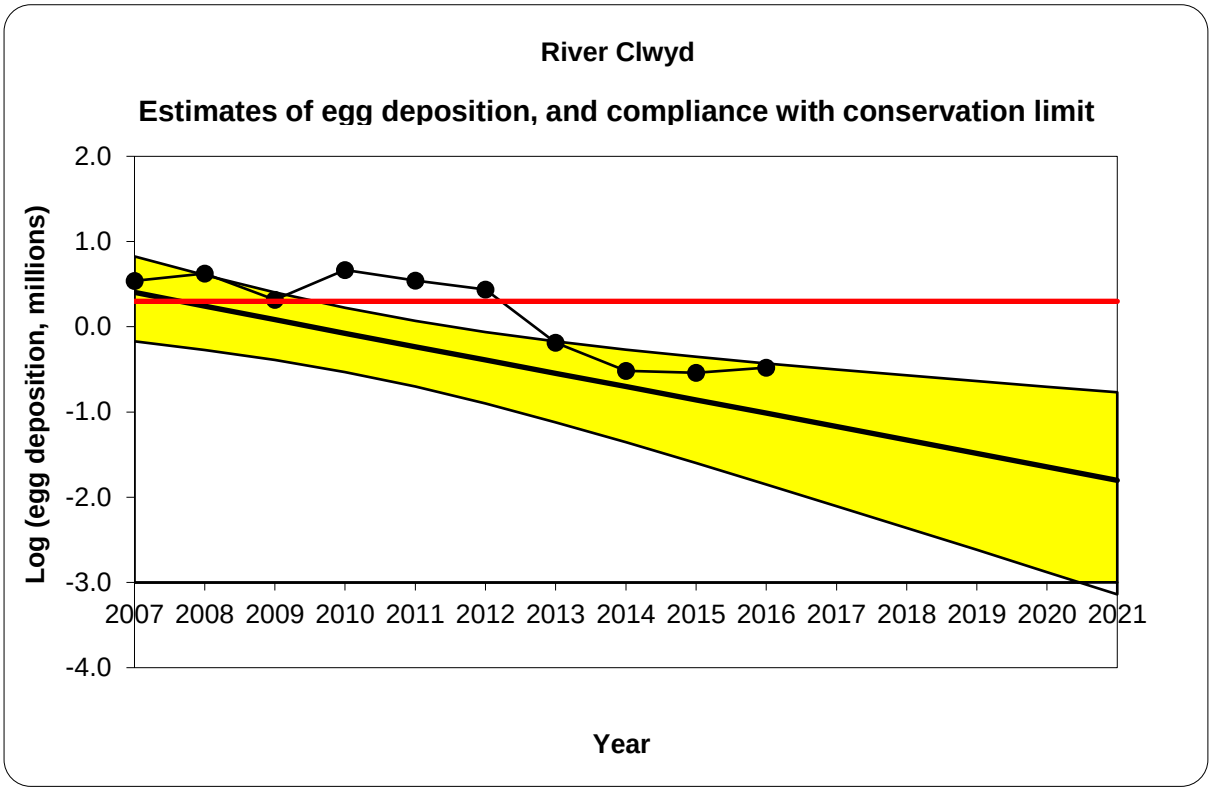


Stock status

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 salmon 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).

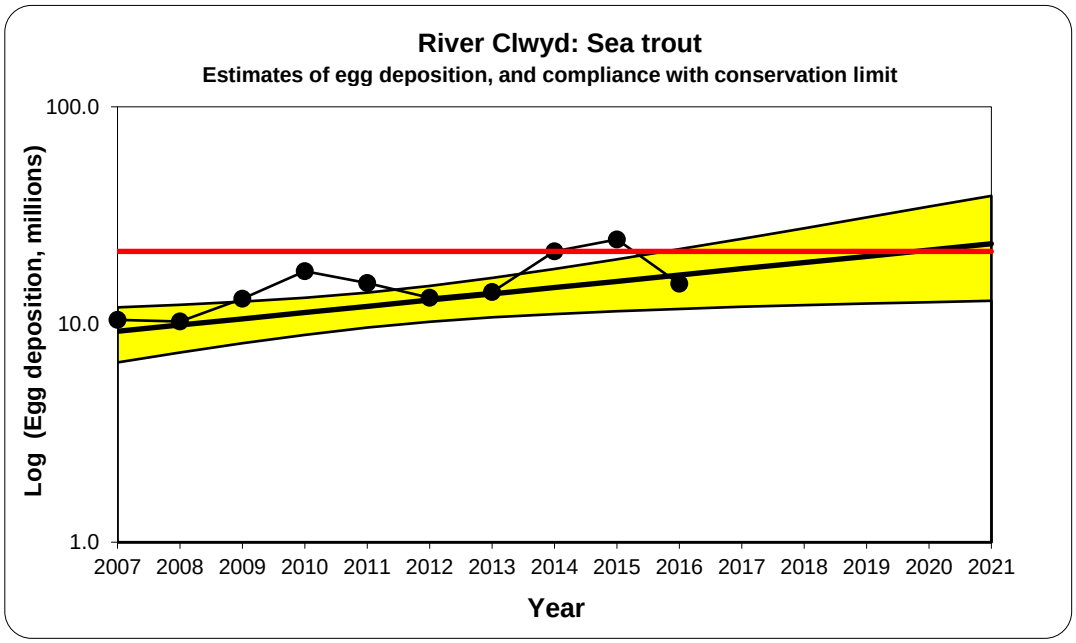
- Current number of eggs being deposited puts stocks **at risk**
- In 5 years' time the predicted status of salmon stocks will be **at risk**
- Based on current data, and the projection of the graph, the stocks of salmon on the Clwyd will continue to **decline** **(uncertain)**

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 salmon stocks in the catchment?

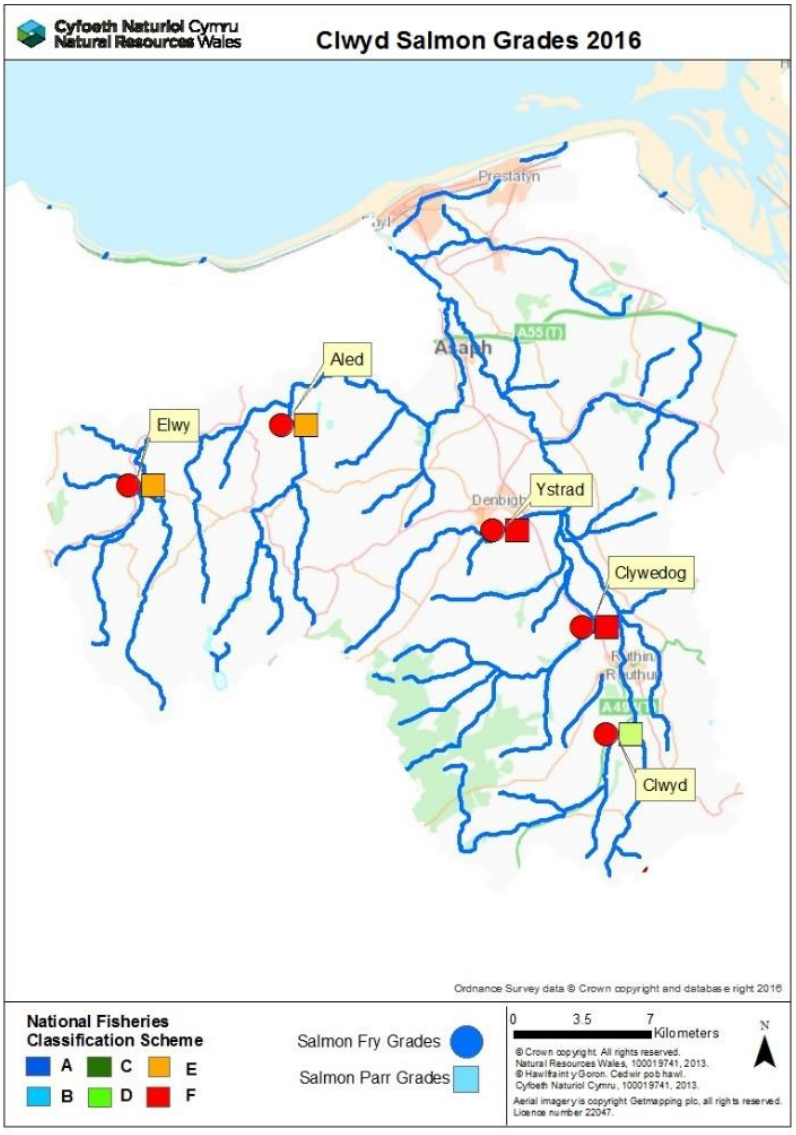
The red line represents the number of eggs required to be deposited to sustain a healthy sea trout stock. The black trend line and its confidence limits (the yellow band) is fitted to the most recent 10-year series of egg deposition estimates (2007-2016).

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

Juvenile Monitoring

The following map shows the results of the 2016 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




Cyfoeth Naturiol Cymru
Natural Resources Wales
Clwyd Trout Grades 2016
Prestatyn
Aled
Elwy
Denbigh
Ystrad
Clywedog
Clwyd
A55 (T)
Ordnance Survey data © Crown copyright and database right 2016
National Fisheries
Classification Scheme
A
B
C
D
E
F
Trout Fry Grades
Trout Parr Grades
0
3.5
7
Kilometers
N
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© Hawlfraint y Goron. Cedwir pob hawl.
Cyfoeth Naturiol Cymru, 100019741, 2013.
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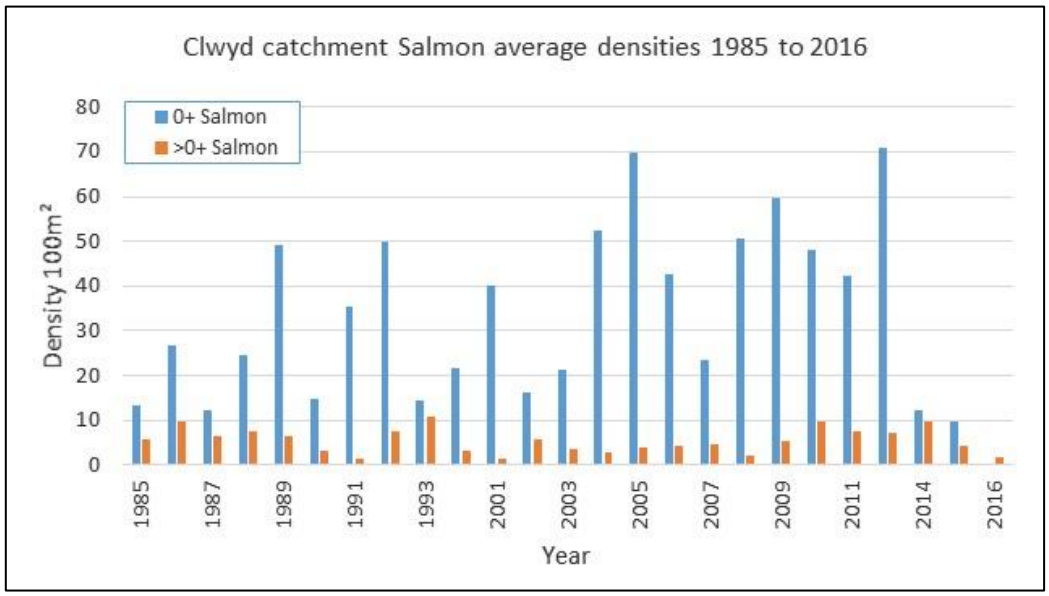
Juvenile Trend Analysis

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.

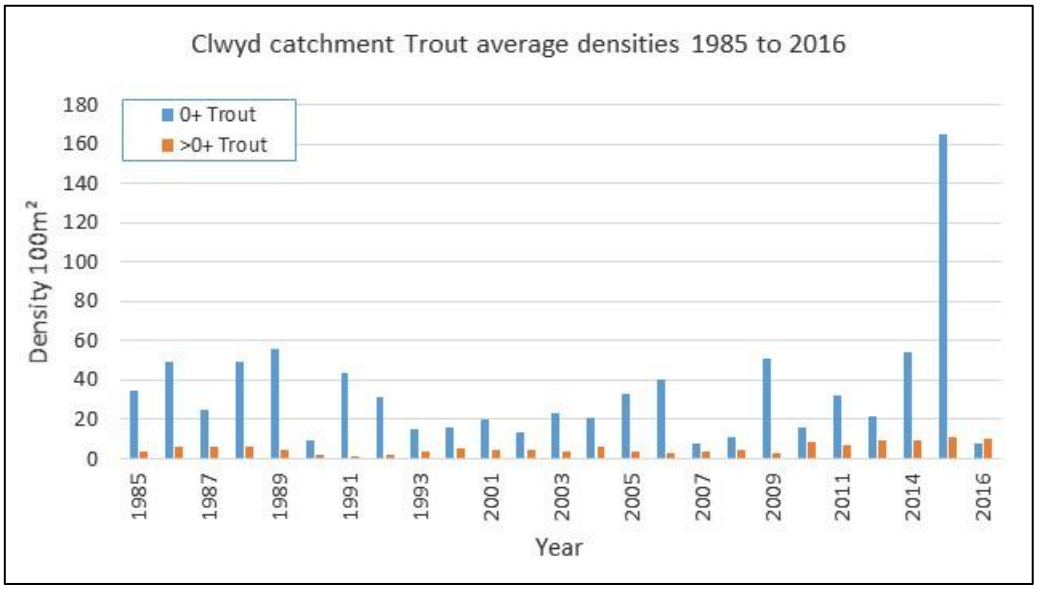
Salmon



Salmon fry and parr densities have fluctuated since monitoring began in 1985, but there appeared to be an improving trend up until 2013. From 2014 onwards there has been a decline that is in line with rod catch.

Juvenile salmon densities across Wales in 2016 have been poor, with some catchments showing significant absences of salmon fry. The Clwyd is one of these catchments. No salmon fry were caught throughout the catchment. 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



Brown trout fry and parr densities on the Clwyd catchment have remained consistent over the years, up until 2015 where there were exceptional numbers of trout fry. This correlated well with the good sea trout rod catch in 2014. The sea trout rod catch in 2015 was once again good but the recruitment has been exceptionally poor. Trout fry densities are some of the lowest on record. We believe this links to the exceptional weather conditions. Trout parr densities have remained consistent.

Further investigations

Due to the exceptionally poor results on the Clwyd, additional five-minute fry surveys were carried out across the catchment. No salmon fry were caught, and only two salmon parr were caught (Corris) during the additional monitoring. Trout fry numbers improved higher up main rivers such as the Elwy & Clywedog but were not exceptional. The Nant Mawr appeared to be good though water levels were very low. The Deunant which is usually excellent for trout only provided 6 trout fry during the five-minute period. Rivers such as the Ystrad, Melai, Gallen & Dwrial did not have any trout fry at the sites that were sampled. Trout parr numbers at the sites sampled appeared good.

We have noted that flows were extremely high and temperatures were unseasonably warm in our rivers through December, the key spawning period for our salmon, and as such, we are pursuing this as a potential cause with our external partners.

Cyfoeth Naturiol Cymru
Natural Resources Wales

Fisheries Actions – Clwyd

Site	Action	Benefits	Lead	Partner(s)	Timescales for delivery
Clwyd	**Barriers to be addressed:** • Nant Melin Dwr (SJ083577)– easement of partial barrier • Investigation of barriers on the catchment to improve fish passage • Maintenance of Bontuchel and Rhewl fish passes	• Improved knowledge of barriers to improve access for fish, including salmon and trout to spawning areas upstream. • Improved access to spawning areas and habitat upstream. • Improved fish numbers and increased diversity of fish populations - increased resilience. • Access maintained to juvenile habitat and spawning areas upstream	NRW	CCGRT	2016/17 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
	Enforcement: Action to reduce illegal activity on information provided and investigations	Reduced illegal activity, more fish remain in the sys	NRW	Stakeholders North Wales Police	Ongoing

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Abbreviations

NRW – Natural Resources Wales **CCGRT – Clwyd, Conwy & Gwynedd Rivers Trust**

Fisheries Actions – Clwyd

Site	Action	Benefits	Lead	Partner(s)	Timescales for delivery
Clwyd	**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.	• Waterbodies protected and improved • WFD waterbodies achieving Good Status/Potential including Gallen, Corris, Wheeler - lower and Wheeler - upper	NRW	NRW CCGRT Wildlife Trusts Local Authorities Landowners DCWW	Ongoing
	Improvements in phosphorus discharges in 2 water bodies (Clwyd - tidal limit to Hesbin and Glanfyddion Cut).	Required standard in phosphorus is achieved	DCWW	NRW	
	Investigations in a further 4 water bodies (Bach, Dwr Ial, Meirchion, Wheeler - upper)	Understand how water company assets contribute to the failure to achieve good ecological status and what measures are needed to achieve good ecological status.	DCWW	NRW	
	Alyn and Chwiler Living Landscape project	Improved river corridors for wildlife and local people	North Wales Wildlife Trust	NRW Clwydian Range & Dee Valley AONB Flintshire & Denbighshire Local Authorities North East Wales Wildlife British Association of Shooting & Conservation	

Abbreviations

NRW – Natural Resources Wales **DCWW – Dwr Cymru Welsh Water** **CCGRT – Clwyd, Conwy & Gwynedd Rivers Trust**

AONB – Area of Outstanding Natural Beauty