



# Know Your River - Dysynni

## Salmon & Sea Trout Catchment Summary

### Introduction

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

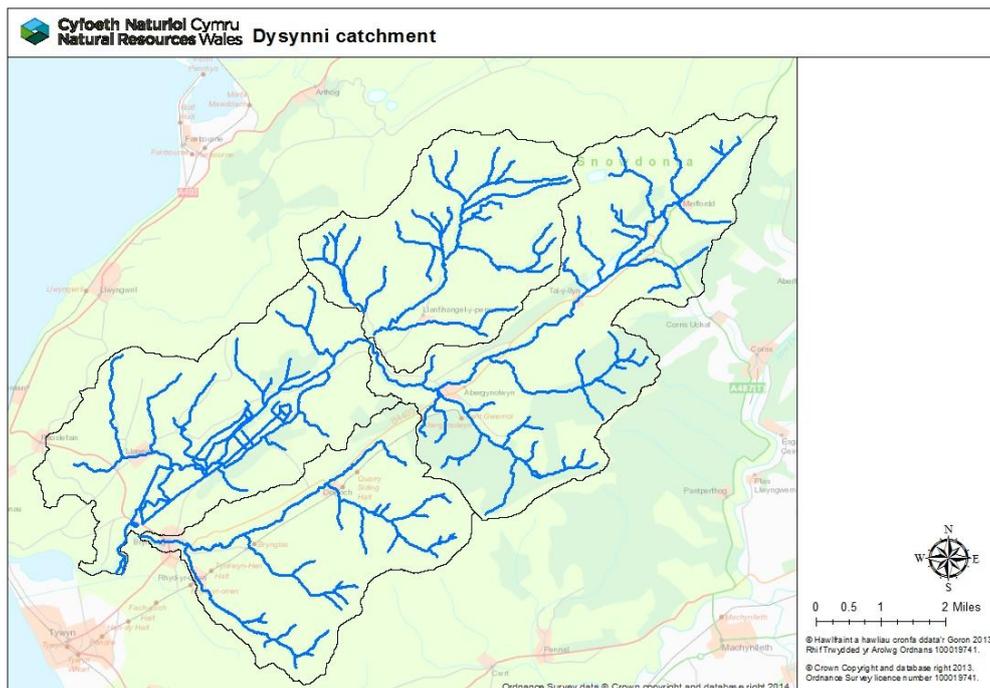
Action tables set out habitat improvements to restore freshwater productivity of salmon and sea trout populations. These tables also include some work which will be carried out by our partner organisations, not just Natural Resources Wales (NRW).

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 Dysynni rises on the slopes of Cadair Idris, draining a predominantly upland catchment (72.2 km<sup>2</sup>) into Cardigan Bay, north of Tywyn after flowing a distance of 30.1km. The largest populated area within the catchment is the small town of Tywyn with a population of 2,995 (1991 Census). The catchment is in a predominantly rural area incorporating the Cadir Idris National Nature Reserve and areas of the Dyfi Forest. The main land use within the catchment is upland area sheep grazing, whilst on the lower flood plain the land is



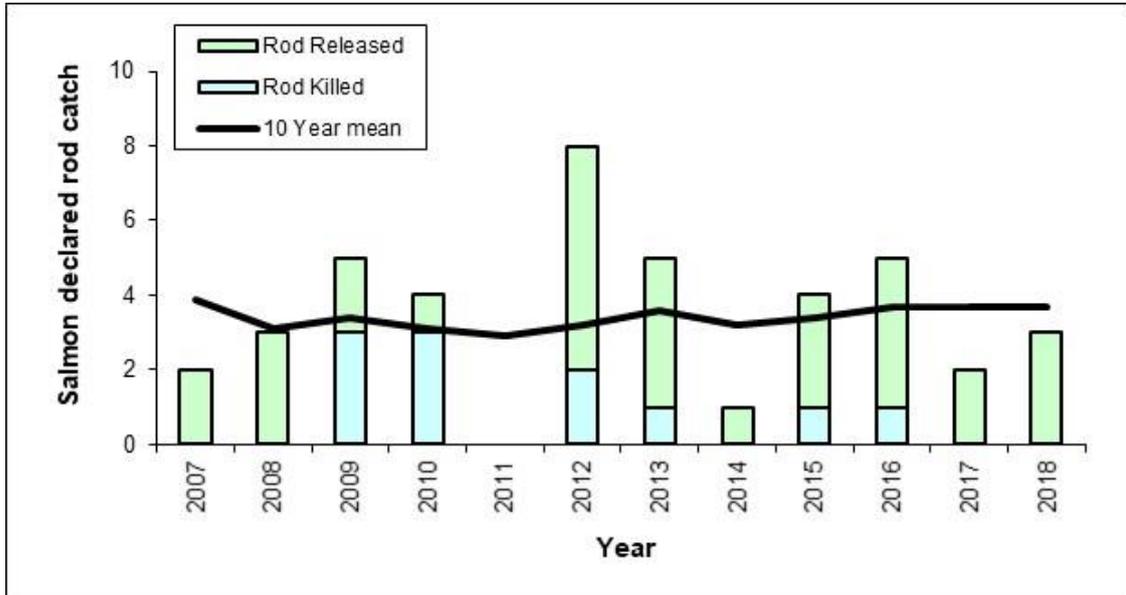
predominantly improved pasture. This area requires an enhanced level of drainage and is designated as an Internal Drainage District (IDD).

The Dysynni catchment lies on a base of Silurian and Ordovician rocks, resulting in rounded hills and plateaux country much less rugged than that of the Snowdonia National Park that lies to the North. Water quality is poor on a number of river stretches, suffering from low pH values due to acidification that can lead to elevated metal concentrations. Contributing factors to the low pH are the predominance of base poor soils in the catchment with low buffering capabilities and coniferous afforestation.

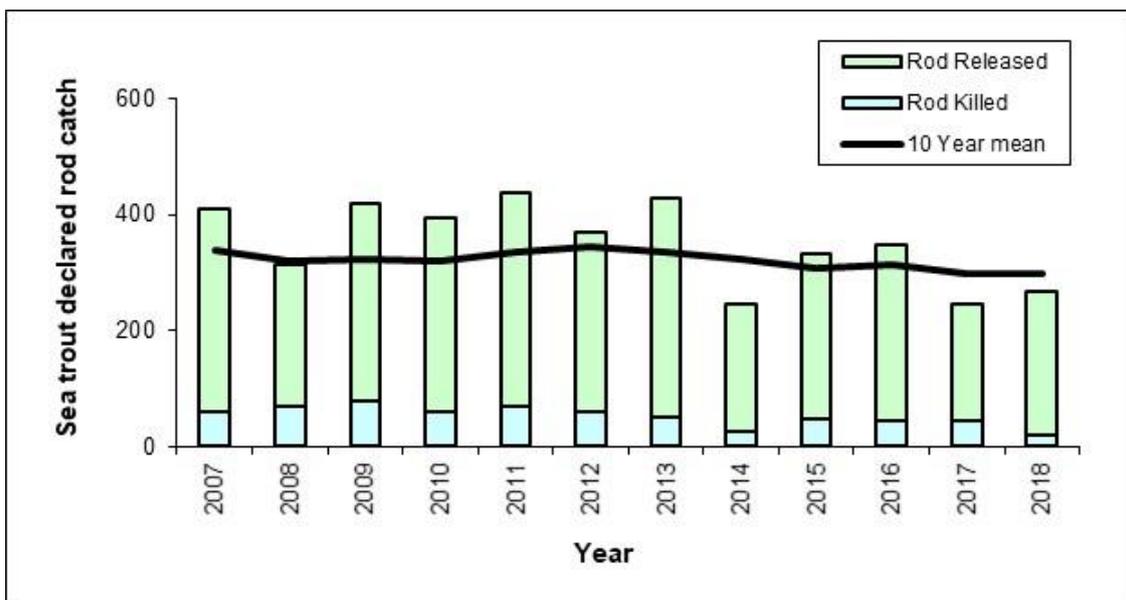
### Rod catches

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

**Salmon rod catch** – improved compared to 2017, however the rod catch is very low. The Dysynni is predominantly a sea trout river. The release rate in 2018 was 100% which is an excellent result and needs to continue.



**Sea trout rod catch** – improved compared to 2017, however this is below the 10 year mean. The release rate in 2018 was 93%. This is excellent and needs to be maintained.

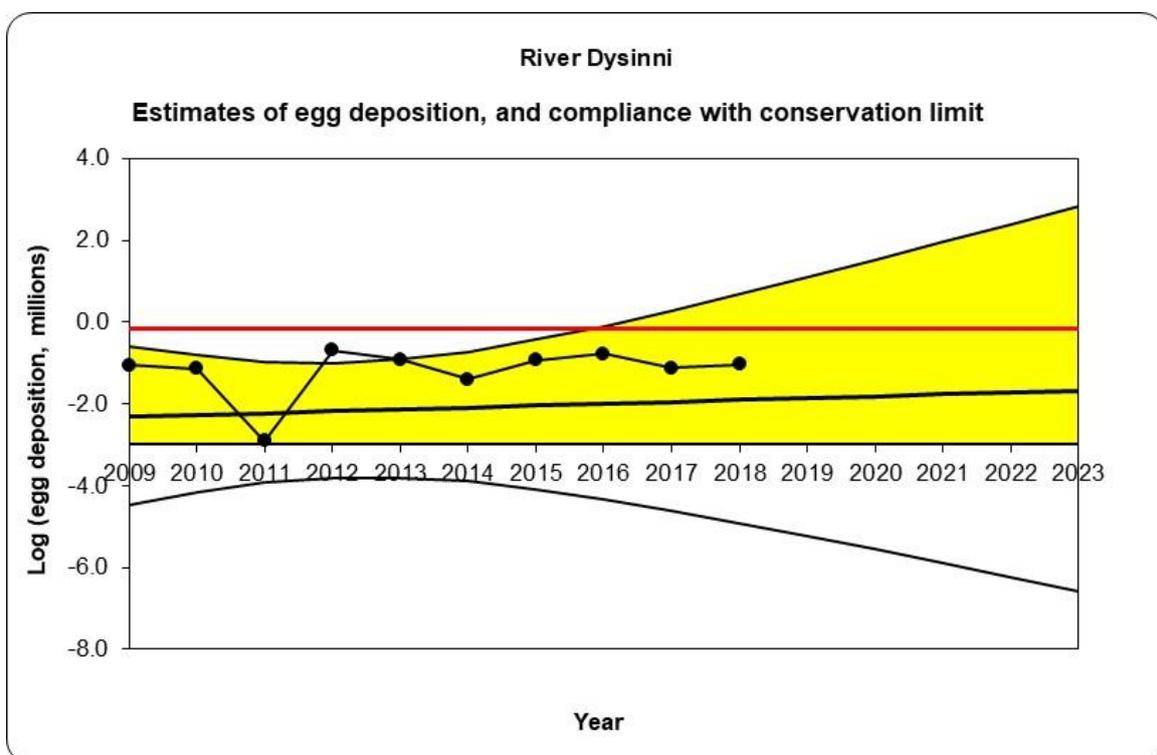


## Stock status

### 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 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. The black trend line and its confidence limits (the yellow band) is fitted to the most recent 10-year series of egg deposition estimates (2009-2018).

- 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 Dysynni will continue to **improve (uncertain trend)**

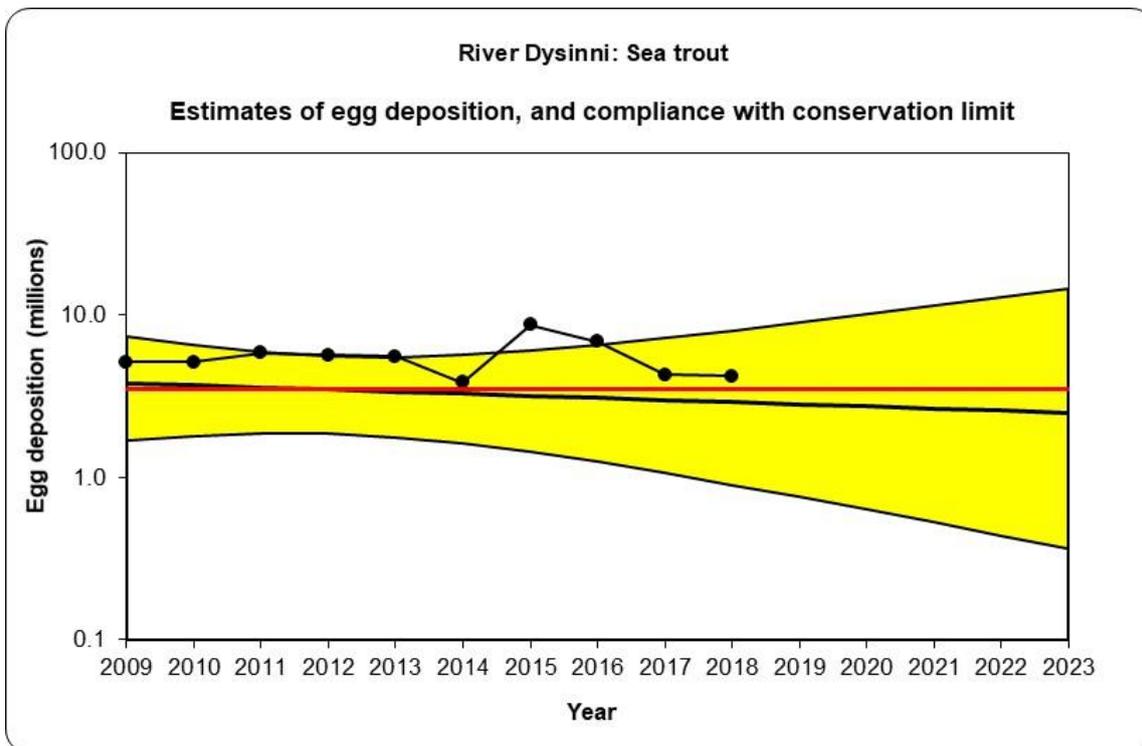
## Conservation of Sea Trout

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 (2009-2018).

- 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 sea trout on the Dysynni will continue to **decline (uncertain)**

## Juvenile Monitoring

The maps on the previous page show the results of the routine juvenile salmonid population surveys from 2018 on the Dysynni.

The symbols display the National Fish Classification Scheme (NFCS) grades which have been developed to evaluate and compare the results of fish population surveys in a consistent manner. The NFCS ranks survey data by comparing fish abundance at the survey sites with sites across Wales and England 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 NFCS.

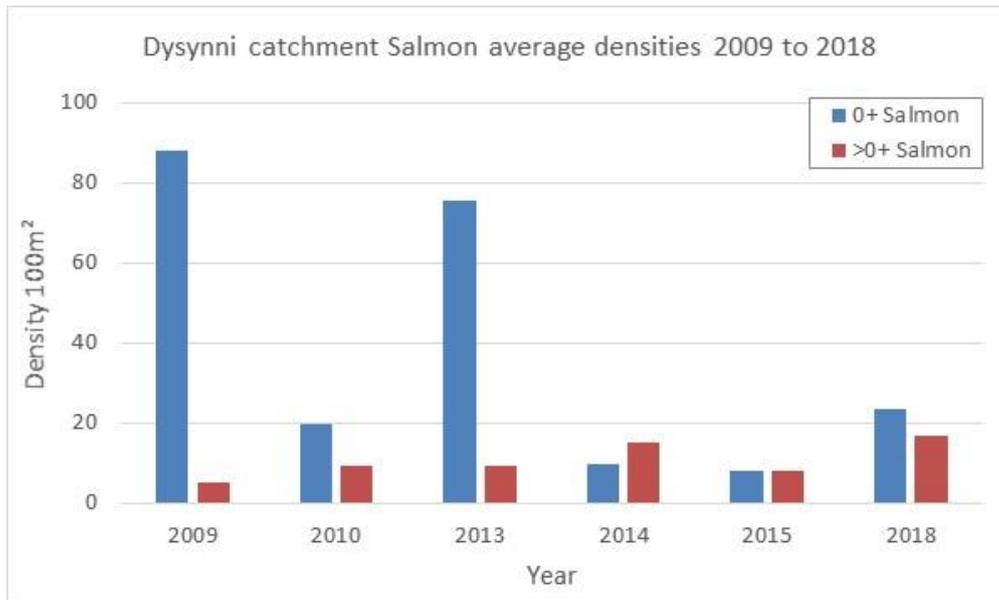
Grade	Descriptor	Interpretation
<b>A</b>	Excellent	In the top 20% for a fishery of this type
<b>B</b>	Good	In the top 40% for a fishery of this type
<b>C</b>	Fair	In the middle 20% for a fishery of this type
<b>D</b>	Fair	In the bottom 40% for a fishery of this type
<b>E</b>	Poor	In the bottom 20% for a fishery of this type
<b>F</b>	Fishless	No fish of this type present



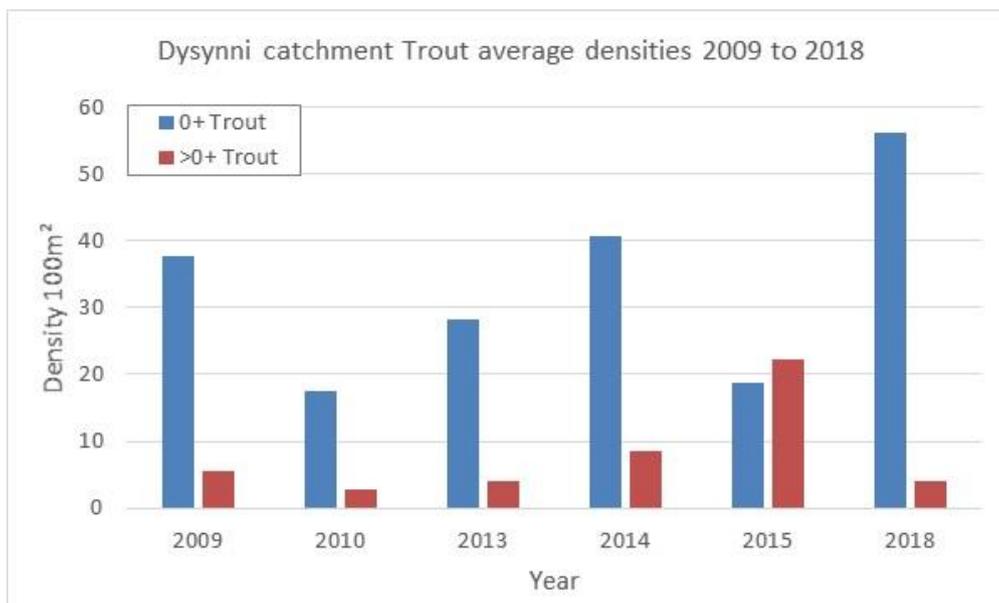
### Catchment Population Trends

The graphs below show a simple comparison of average salmon and trout densities for the temporal site (Downstream Tal y Llyn) on the Dysynni catchment since surveying began in 2009. Surveys were not carried out in 2011, 2012, 2016, and 2017 due to consistent high flows throughout the summer.

Salmon fry densities have varied greatly at the temporal site. The density in 2018 is relatively low compared to the more positive years. Salmon parr density was good in 2018, perhaps indicating that 2017 may have been a good spawning year.



Brown trout fry densities were excellent in 2018, and this was the case across all the Dysynni spatial sites. Trout parr densities were low compared to the historic data, however many of the spatial sites performed excellently.



The following table shows a simple comparison of the Dysynni temporal site density for juvenile salmon and trout from 2018, and compares this to 2015 (the last time the site was surveyed) and the 5-year average.

	<b>0+ Salmon</b>	<b>&gt;0+ Salmon</b>	<b>0+ Trout</b>	<b>&gt;0+ Trout</b>
2018 average density	23.6	16.8	56.2	3.9
2015 average density	7.9	7.8	18.8	22.3
<b>Percentage difference to 2015</b>	<b>200%</b>	<b>114%</b>	<b>199%</b>	<b>-82%</b>
5-yr average (2011-15)	31.0	10.7	29.2	11.7
<b>Percentage difference to 5-yr average</b>	<b>-24%</b>	<b>57%</b>	<b>92%</b>	<b>-66%</b>

Salmon fry densities are much improved compared to 2015, however they are below the 5-year average. This has been seen across many of the smaller rivers in North Wales. Salmon parr densities however seem very good at the site in 2018 compared to the historic data. This would suggest that spawning was successful in the winter of 2016/17. Salmon rod catches are sporadic on the Dysynni as the fishing is predominantly for sea trout.

Trout fry densities in 2018 were excellent compared to the historic data. This was seen across the catchment. This does not mirror the rod catch, and effort has remained consistent for the past ten years. This would imply that stocks are stable, and that 2017 was just a very successful spawning year. Trout parr densities were poor compared to the historic data at the temporal site, however many of the tributaries were excellent for trout parr.