

Know Your River – Dwyrdd Salmon & Sea Trout Catchment Summary

Introduction

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

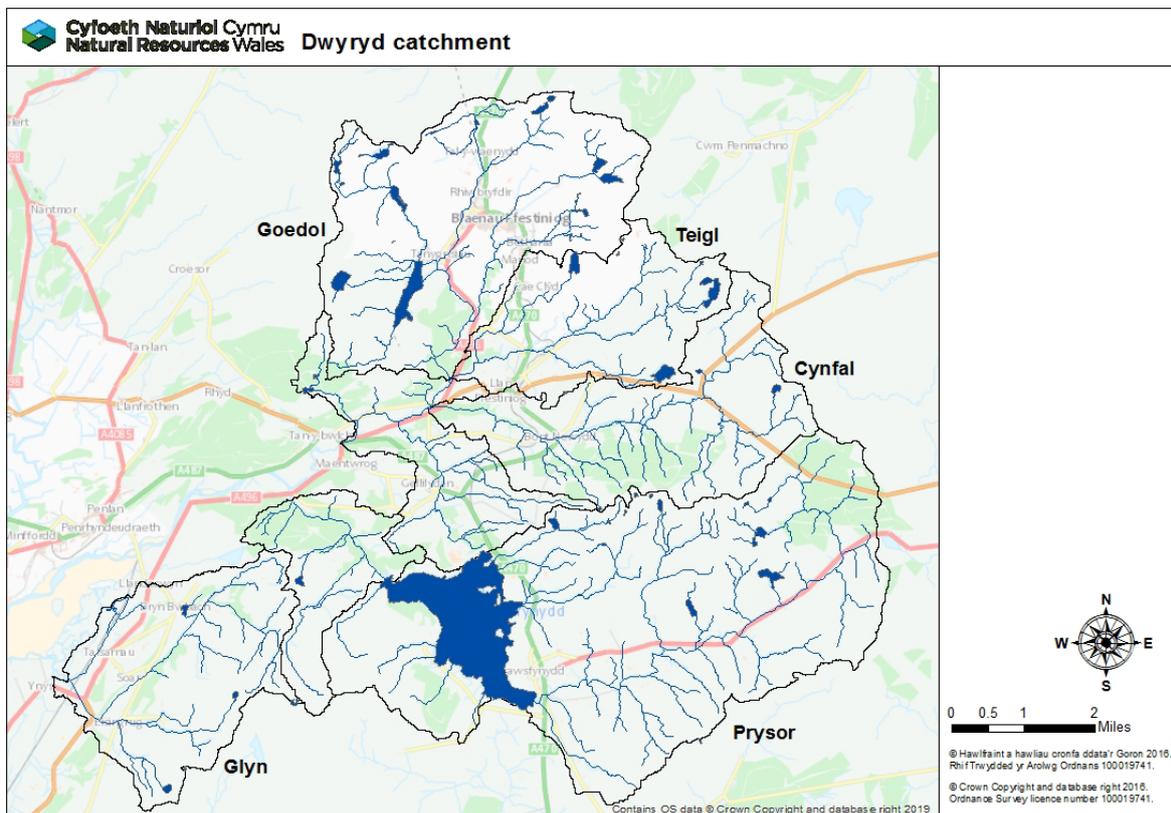
Action tables set out habitat improvements to restore freshwater productivity of salmon and sea trout populations. These tables also include some work which will be carried out by our partner organisations, not just Natural Resources Wales (NRW).

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 Dwyrdd is predominantly rural with agricultural activity being dominated by sheep farming in the upper reaches of the catchments, gradually changing to mixed sheep and beef further down the valley. Industrial development is limited to Blaenau Ffestiniog.



Blaenau Ffestiniog was once the largest slate quarrying town in the world and now has a legacy of derelict land covered in slate spoil. Slate quarrying continues at four main sites around the town. Both the Barlwyd and Goedol have suffered from slate dust contamination in the past although remedial work at the quarries has reduced the occurrence of this source of intermittent pollution in recent years.

This mountainous area, directly open to the prevailing south westerly winds, receives heavy rainfall. Although the acidity of rainwater is not high, the volume of rain falling in the area gives rise to high annual acid deposition. In the absence of neutralising bases within the thin soils, these areas are 'acid vulnerable' and as a result their water courses are subjected to periodic acid flushes which can reduce water quality and salmonid fish survival. In addition, the abundance of old mine workings, slate quarries and coniferous afforestation are known to exacerbate the impact of acidification in parts of the Dwyryd catchment.

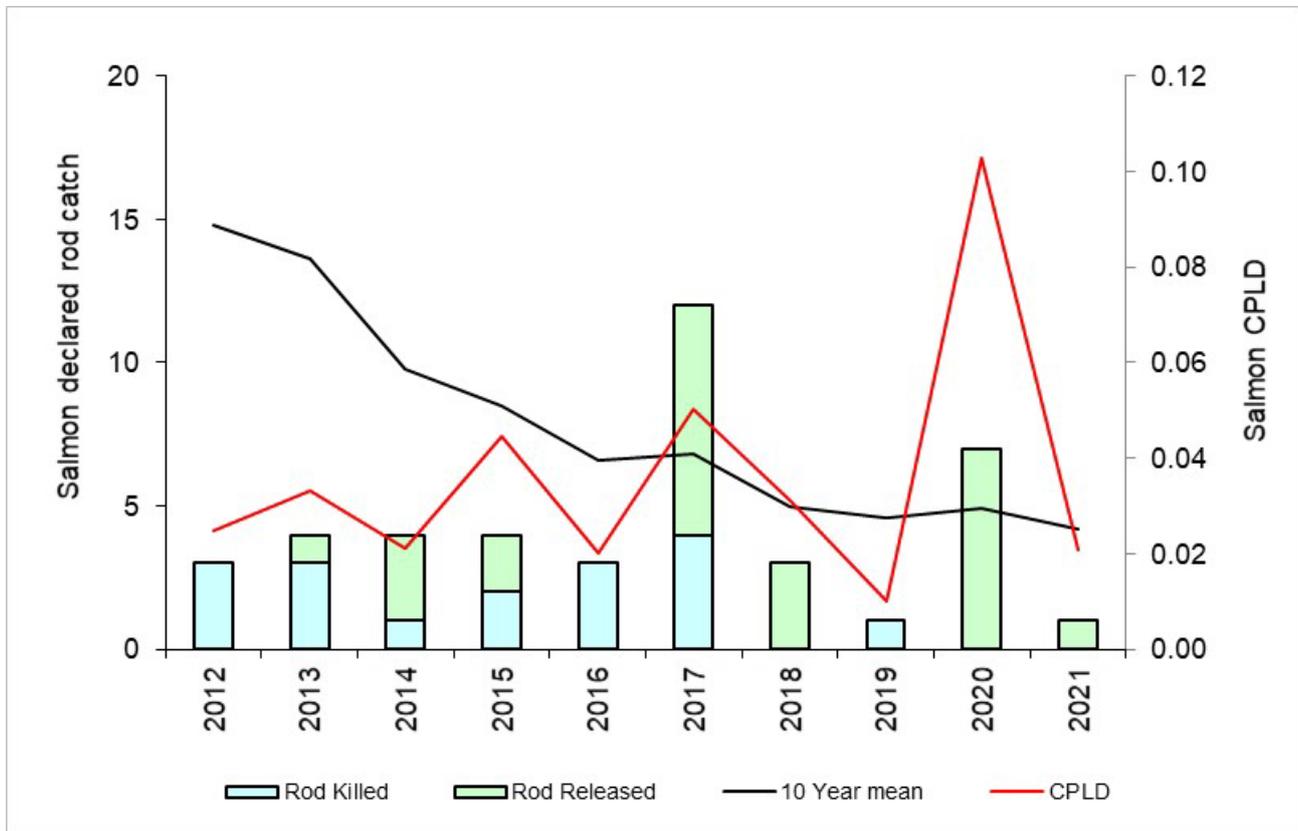
The terrain of this area, with its upland lakes and high rainfall, also makes it well suited to hydroelectric power (HEP) generation. In all there are ten HEPs situated in the Dwyryd catchment. The major schemes at Tanygrisiau and Maentwrog (Dwyryd) have the potential to impact upon salmonid fish by causing fluctuations in natural flow and temperature regimes.

Rod Catches

The following tables show the total declared rod catches for salmon and sea trout on the Dwyrdd and also the Catch Per Licence Day. CPLD is an estimate of the average catch per fishing day on a catchment.

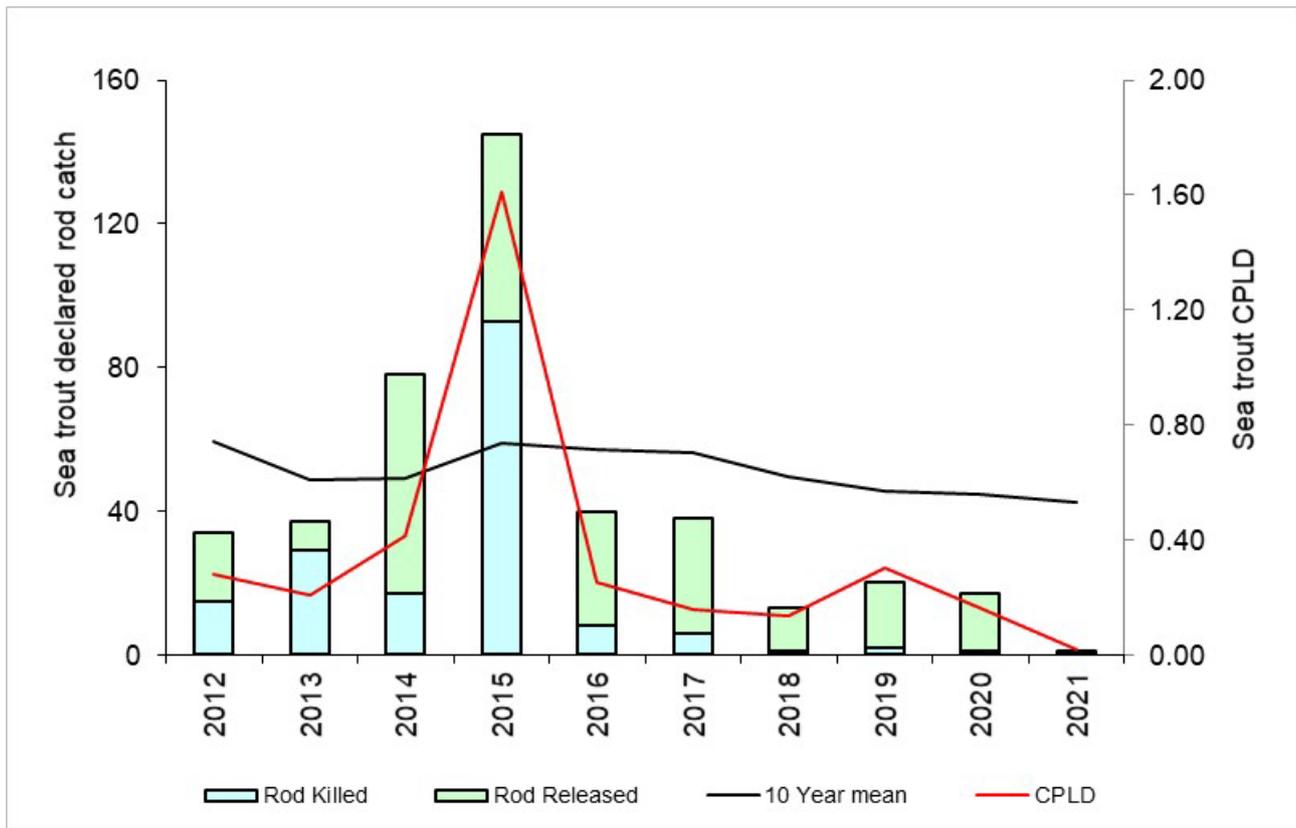
Salmon Rod Catch

Year	Caught	Rod Killed	Rod Released	10 Year mean	Percentage released	Catch per licence day
2021	1	0	1	4.2	100	0.021
2020	7	0	7	4.9	100	0.104
2019	1	1	0	4.6	0	0.010
2018	3	0	3	5.0	100	0.031
2017	12	4	8	6.8	67	0.050
2016	3	3	0	6.6	0	0.020
2015	4	2	2	8.5	50	0.044
2014	4	1	3	9.8	75	0.021
2013	4	3	1	13.6	25	0.033
2012	3	3	0	14.8	0	0.025



Sea Trout Rod Catch

Year	Caught	Rod Killed	Rod Released	10 Year mean	Percentage released	Catch per license day
2021	1	0	1	42.3	100	0.021
2020	17	1	16	44.7	94	0.254
2019	20	2	18	45.6	90	0.104
2018	13	1	12	49.6	92	0.135
2017	38	6	32	56.1	84	0.160
2016	40	8	32	57.1	80	0.250
2015	145	93	52	58.8	36	1.611
2014	78	17	61	49.3	78	0.415
2013	37	29	8	48.5	22	0.208
2012	34	15	19	59.5	56	0.283

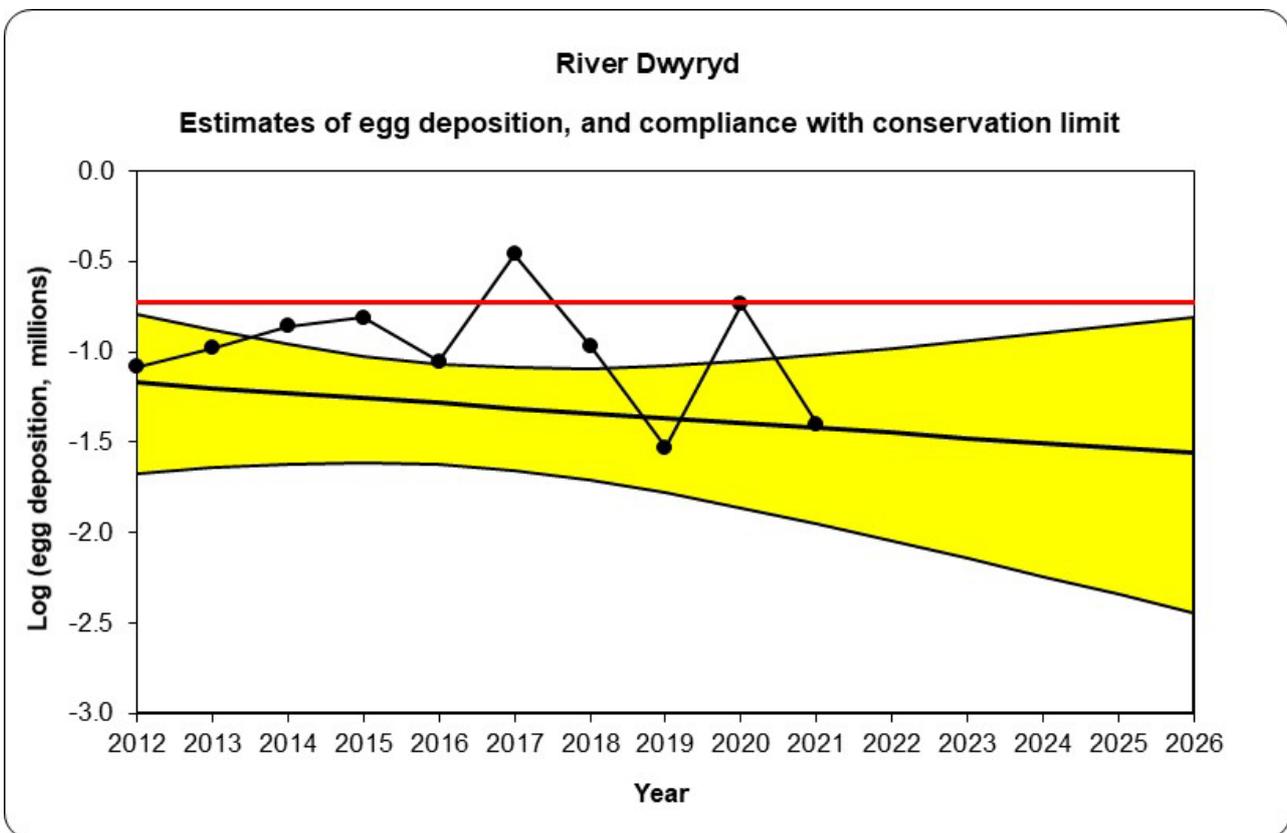


Stock Status

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 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 ten-year series of egg deposition estimates (2012-2021).

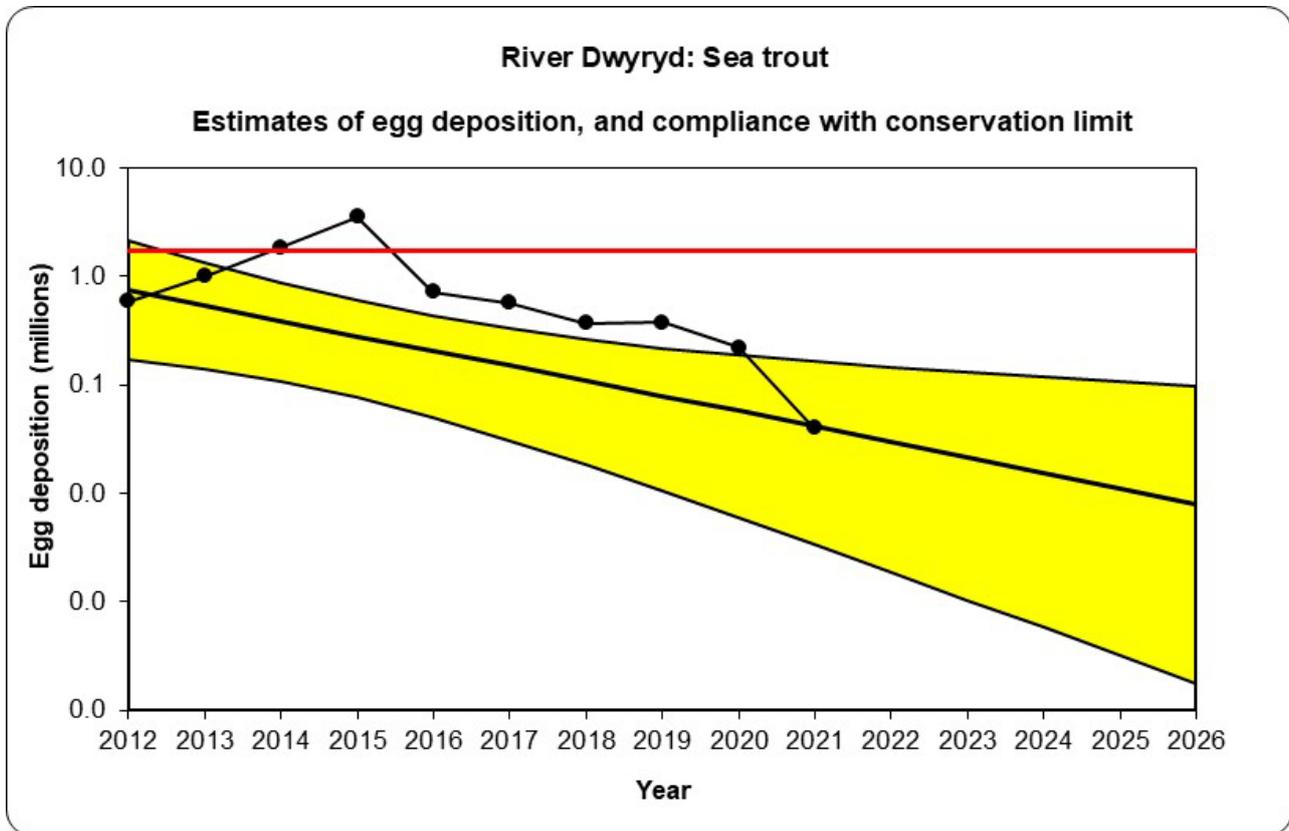
- Current number of eggs being deposited puts stocks **at risk**
- In five years' time the predicted status of salmon stocks will be **at risk**
- Based on current data, and the projection of the graph, the stocks of salmon on the Dwyryd will continue to **decline (uncertain trend)**

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: [Technical case for fishing controls to protect salmon and sea trout](#)).



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 ten-year series of egg deposition estimates (2012-2021).

- Current number of eggs being deposited puts stocks **at risk**
- In five 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 sea trout on the Dwyryd will continue to **decline (downward trend)**

Juvenile Salmonid Monitoring Programme

In 2022 the temporal (annual) programme consisted of two sites on the Dwyryd. The temporal data is used to look at trends in juvenile salmon and trout densities giving an indication of how successful spawning has been across the whole catchment.

Salmon and Trout Classifications

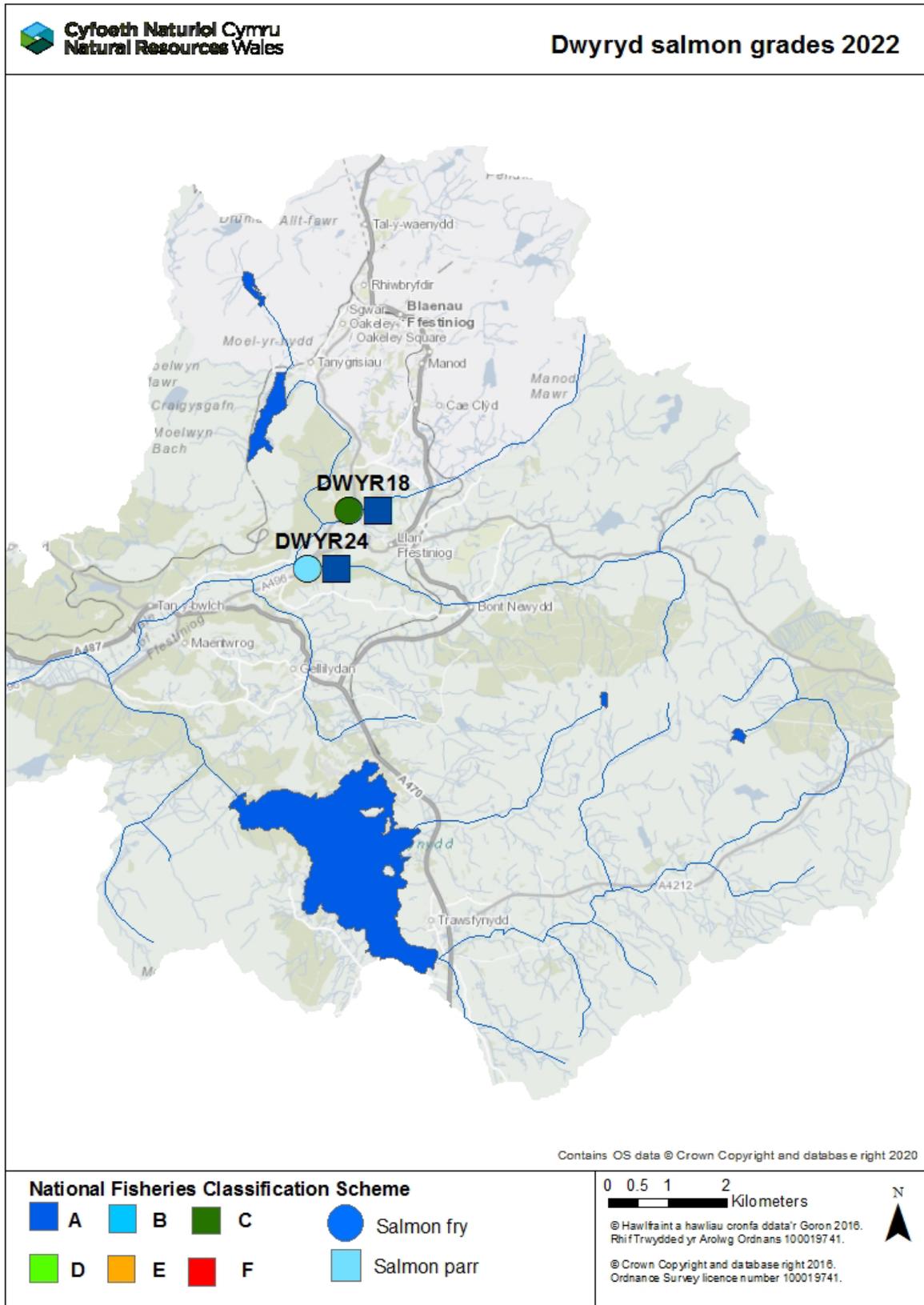
The tables/maps below show the results of the routine juvenile salmonid population surveys on the Dwyryd in 2022.

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.

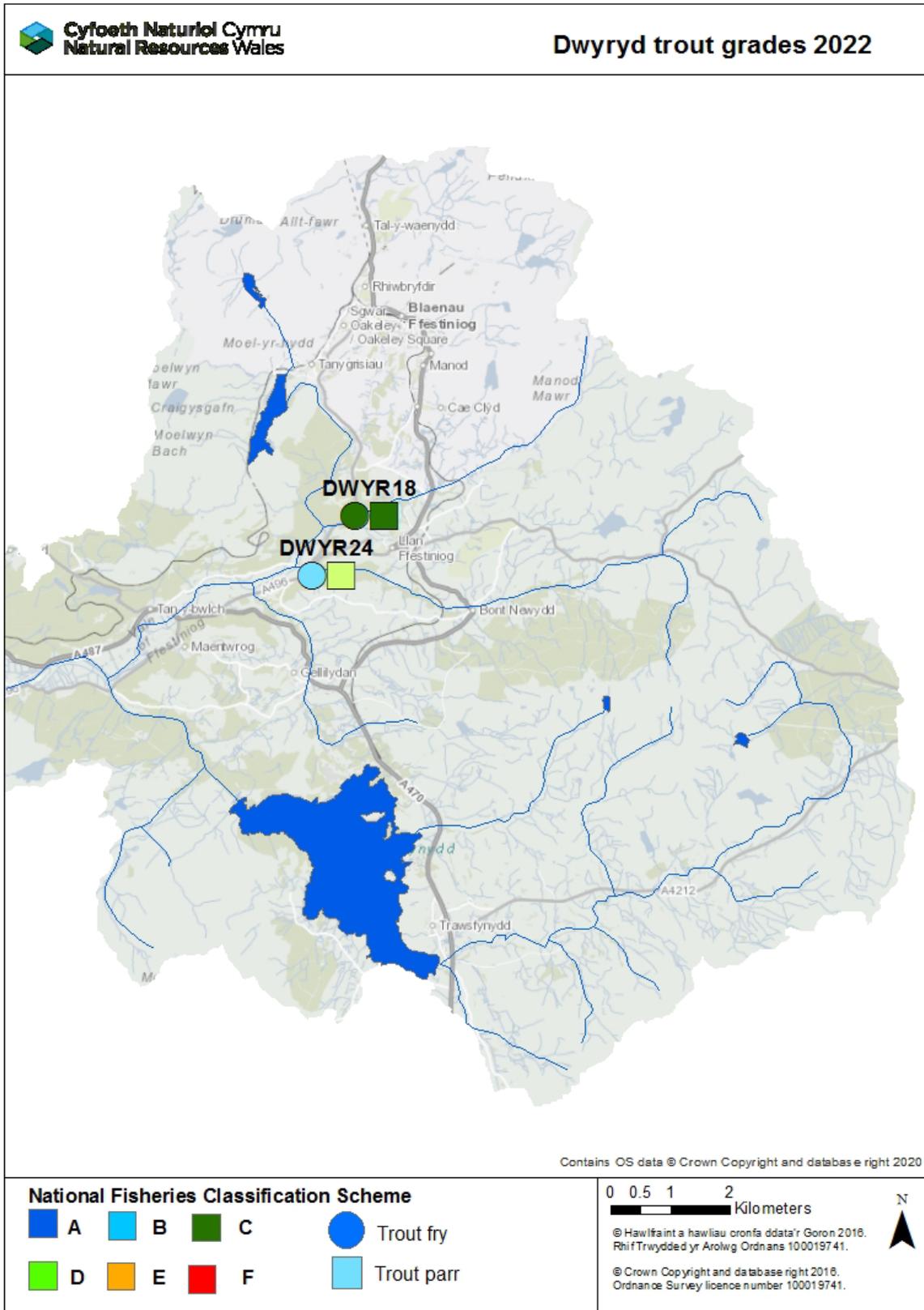
Grade	Descriptor	Interpretation
A	Excellent	In the top 20% for a fishery of this type
B	Good	In the top 40% for a fishery of this type
C	Fair	In the middle 20% for a fishery of this type
D	Fair	In the bottom 40% for a fishery of this type
E	Poor	In the bottom 20% for a fishery of this type
F	Fishless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

Catchment	Site code	Year	Salmon fry grade	Salmon parr grade	Trout fry grade	Trout parr grade
Teigl	18	2022	C	A	C	C
Cynfal	24	2022	B	A	B	D

Dwyrdd juvenile salmon grades 2022



Dwryd juvenile trout grades 2022

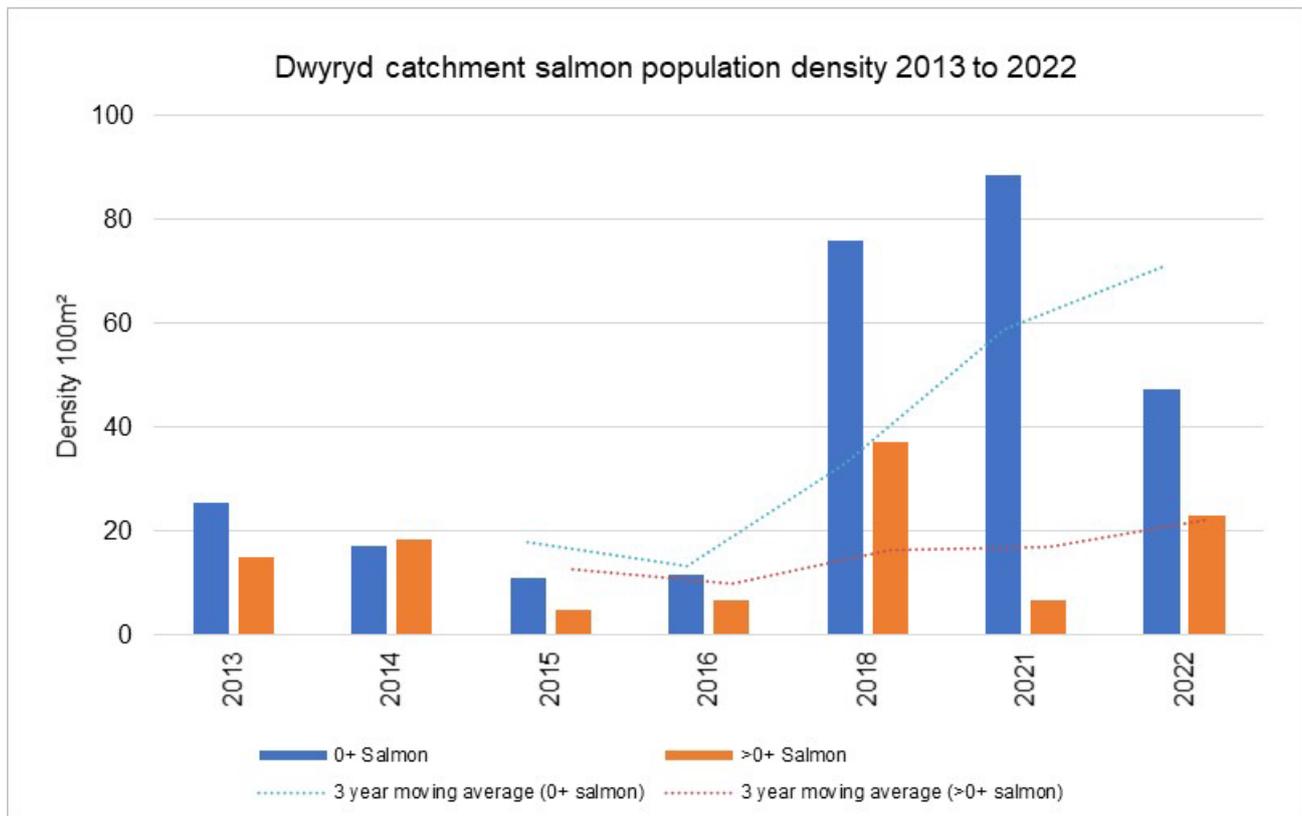


Catchment Population Trends

The tables/graphs below show the average salmon and trout densities for the temporal sites on the Dwyryd catchment since 2013. NB – no surveys were carried out in 2017 & 2019 due to high flows, 2020 was cancelled due to covid restrictions. Site 24 on the Cynfal is a new annual site and has only been surveyed in 2018 and 2022. NA stands for not applicable.

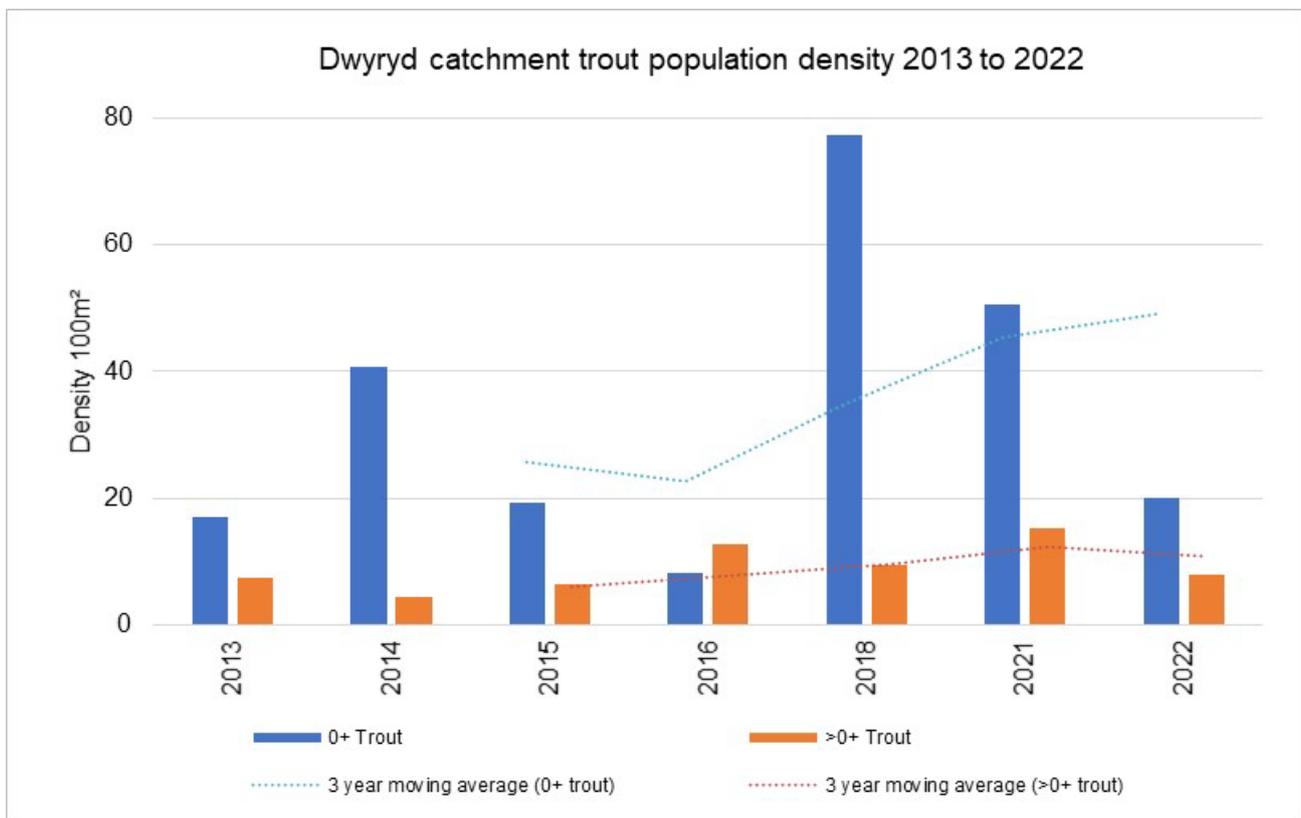
Salmon Population Estimate

Year	0+ Salmon	3-year average (0+ salmon)	>0+ Salmon	3-year average (>0+ salmon)
2022	47.5	70.8	23.0	22.4
2021	88.7	58.8	6.8	17.0
2018	76.1	32.9	37.3	16.4
2016	11.5	13.2	6.9	10.0
2015	11.1	17.8	4.9	12.7
2014	17.1	NA	18.3	NA
2013	25.4	NA	15.0	NA



Trout Population Estimate

Year	0+ Trout	3-year average (0+ trout)	>0+ Trout	3-year average (>0+ trout)
2022	19.9	49.3	8.0	10.9
2021	50.7	45.4	15.3	12.5
2018	77.3	34.9	9.5	9.5
2016	8.3	22.8	12.6	7.8
2015	19.2	25.7	6.4	6.1
2014	40.8	NA	4.5	NA
2013	17.0	NA	7.4	NA



Dwryrd Fisheries Action Table

Planned actions	Benefits	Lead	Partner(s)	Timescale for delivery
<p>Habitat improvements: We will investigate where there is opportunity to improve habitat for fish through improving access over barriers, restoration of riparian and instream habitat, including control of invasive species.</p>	<p>More natural river system, reduced siltation, increased flow diversity, improved spawning gravels and juvenile habitat. Improved fish numbers.</p>	NRW		On-going
<p>Water Framework Directive: We will continue to work to ensure no deterioration, monitor the status of the environment and investigate the 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.</p>	<p>Waterbodies protected and improved WFD waterbodies achieving Good Status/Potential.</p>	NRW	NRW Wildlife trusts Local authorities Landowner DCWW	On-going
<p>Enforcement: Action to reduce illegal activity on information provided and investigations.</p>	<p>Reduce illegal activity, more fish remain in the system.</p>	NRW	Stakeholders North Wales Police	On-going