Know Your River – Rheidol
Salmon & Sea Trout Catchment Summary

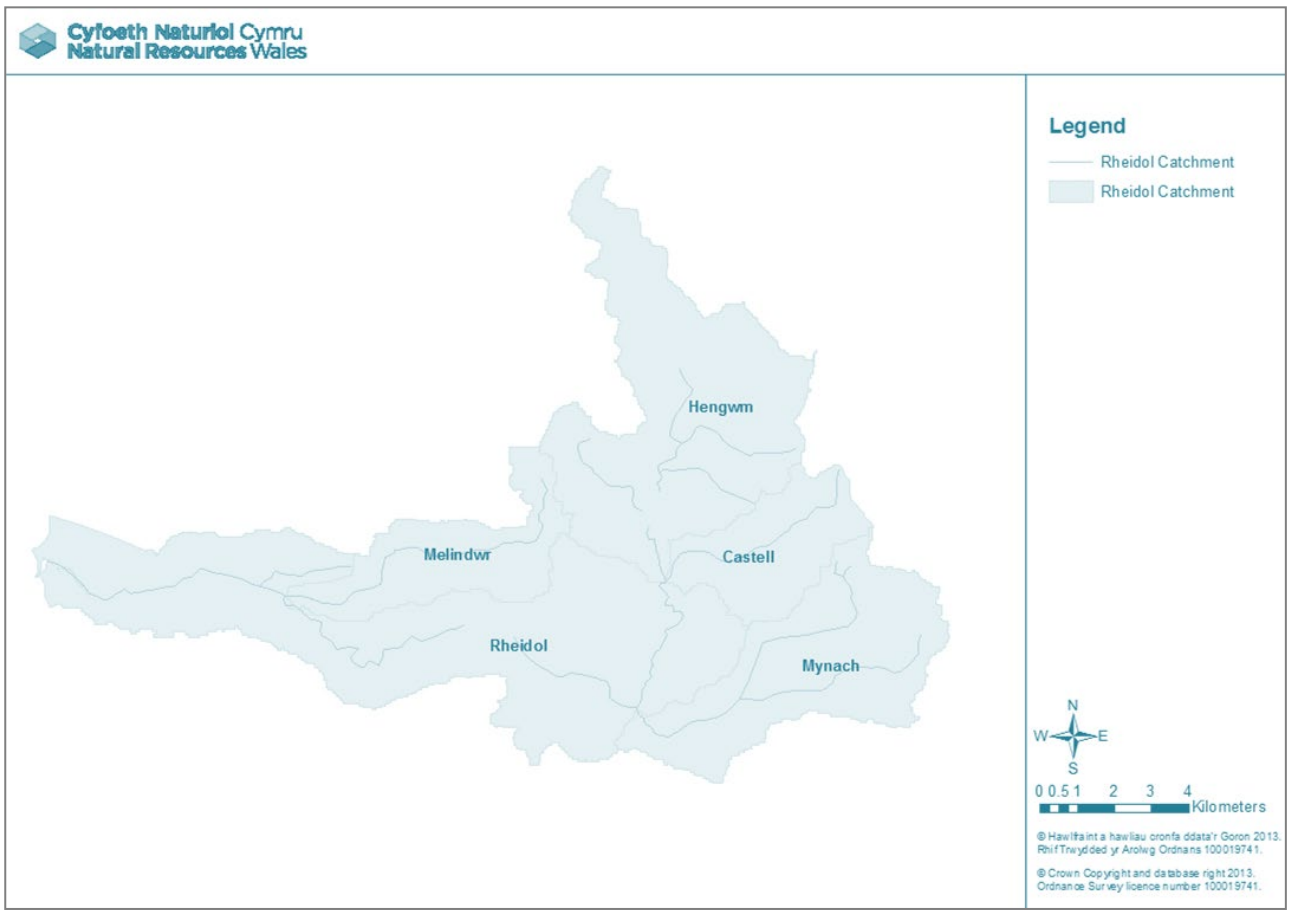
Introduction

This report describes the status of the salmon and sea trout populations in the Rheidol 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 River Rheidol rises from an altitude of 640m in the Cambrian Mountains. From here, the river descends via a series of mountain lakes and reservoirs, then continues through steep sided rocky valleys shaded with tracts of coniferous forest. Finally, the river meanders through glacial gravels, deciduous woodlands and low-lying pastures of the floodplain before reaching the sea. The river flows in a southerly direction to Devils' Bridge and then west to Aberystwyth, where it reaches the sea. The Rheidol is regulated as part of the Rheidol Hydro Electric Scheme. The river drains a catchment area of 187 km2. The principal tributaries are the Mynach on the south side of the catchment and the Melindwr on the north side.

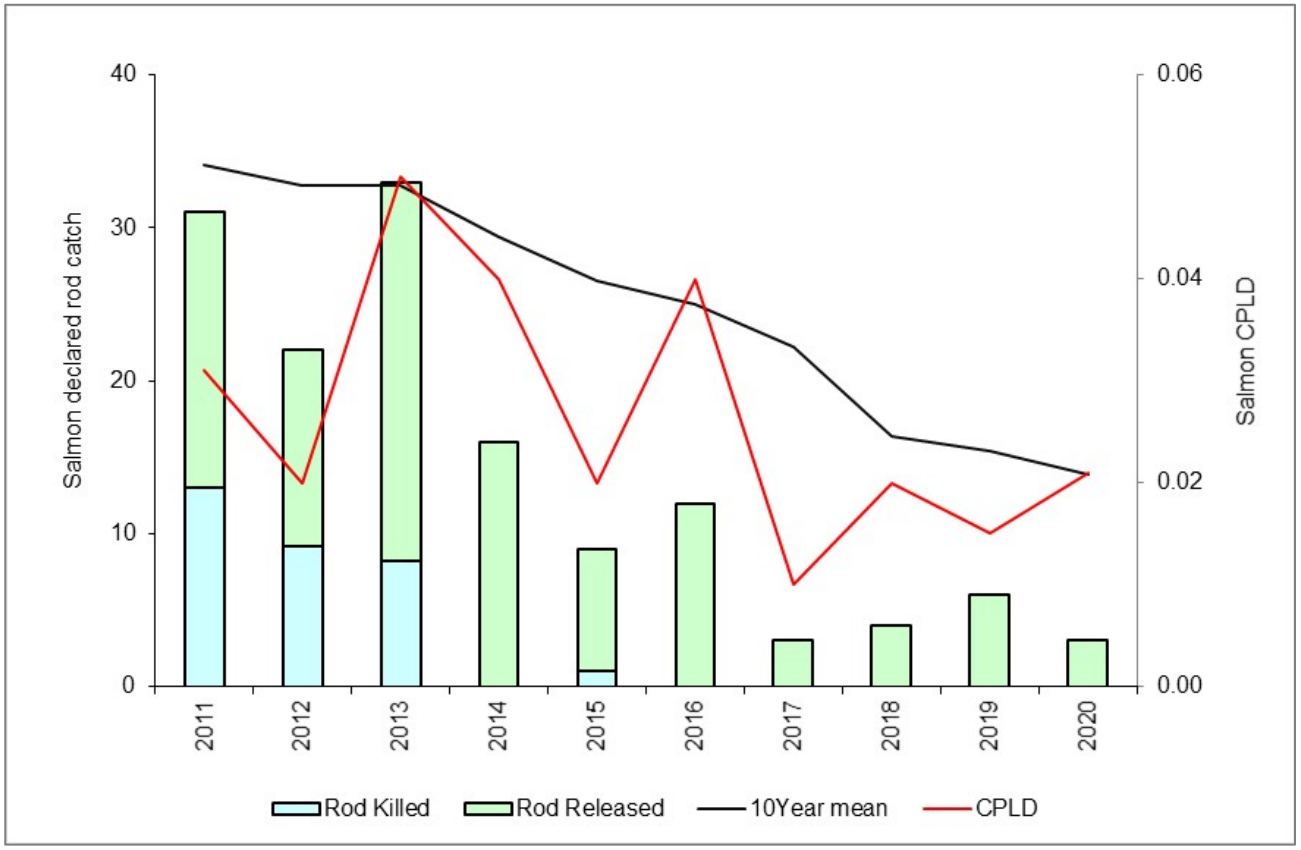
The Rheidol catchment now supports a locally important salmon and sea trout (sewin) fishery. Sea trout are the principal salmonid representing, however an important population of salmon are also present.

Rod Catches

The following tables/graphs show the total declared rod catches of salmon and sea trout on the Rheidol and Catch Per License Day. CPLD is an estimate of the average catch per fishing day on a catchment.

Salmon Rod Catch

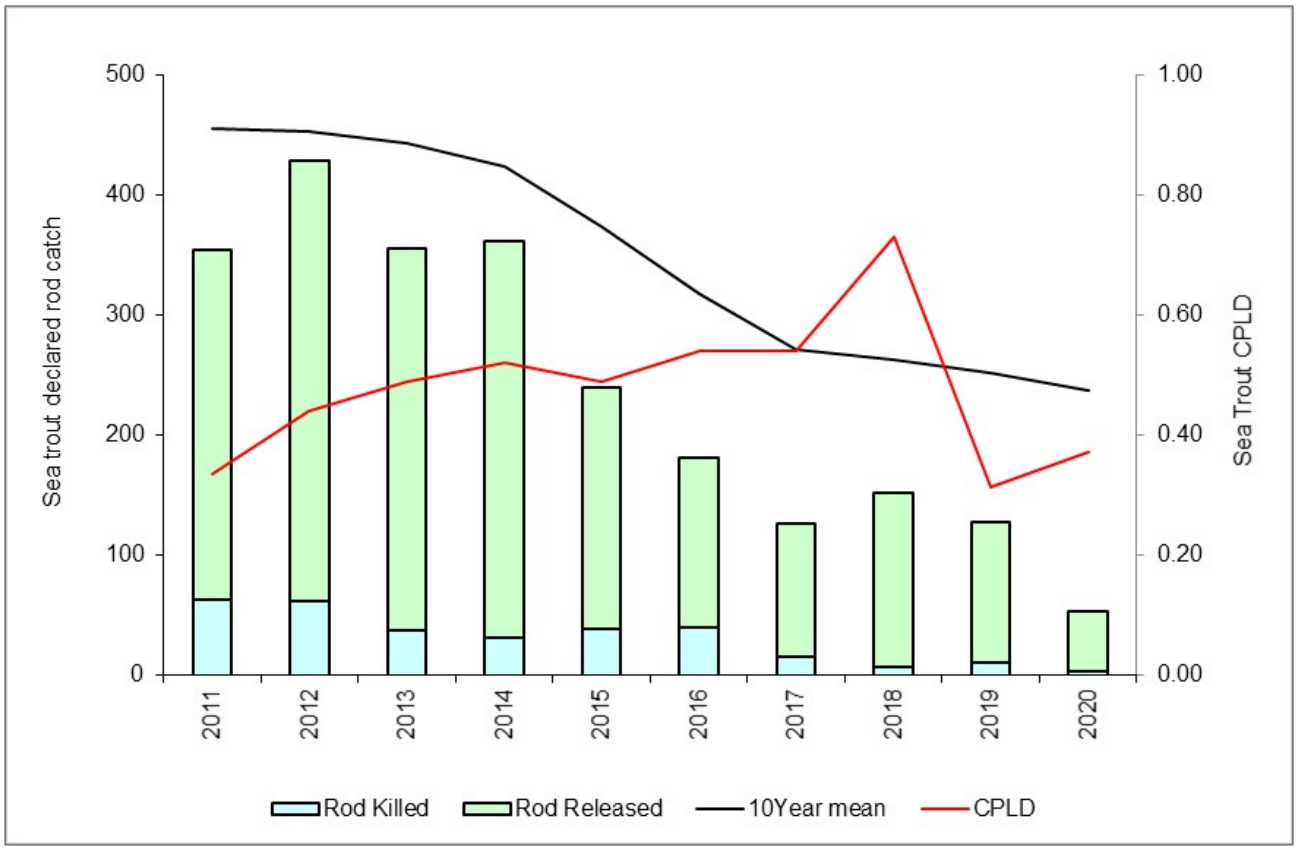
Year	Caught	Rod Killed	Rod Released	10 Year mean	Percentage released	Catch per license day
2020	3	0	3	13.9	100	0.021
2019	6	0	6	15.4	100	0.015
2018	4	0	4	16.4	100	0.020
2017	3	0	3	22.2	100	0.010
2016	12	0	12	25.0	100	0.040
2015	9	1	8	26.5	89	0.020
2014	16	0	16	29.4	100	0.040
2013	33	8	25	32.8	75	0.050
2012	22	9	13	32.8	58	0.020
2011	31	13	18	34.1	58	0.031



Cyfoeth Naturiol Cymru
Natural Resources Wales

Sea Trout Rod Catch

Year	Caught	Rod Killed	Rod Released	10 Year mean	Percentage released	Catch per license day
2020	53	3	50	237.8	94	0.373
2019	127	10	117	252.2	92	0.314
2018	152	7	145	263.3	95	0.730
2017	126	16	110	271.2	87	0.540
2016	181	40	141	317.3	78	0.540
2015	240	38	202	373.6	84	0.490
2014	362	31	331	423.7	91	0.520
2013	355	37	318	442.6	90	0.490
2012	428	62	366	452.3	86	0.440
2011	354	63	291	455.4	82	0.335

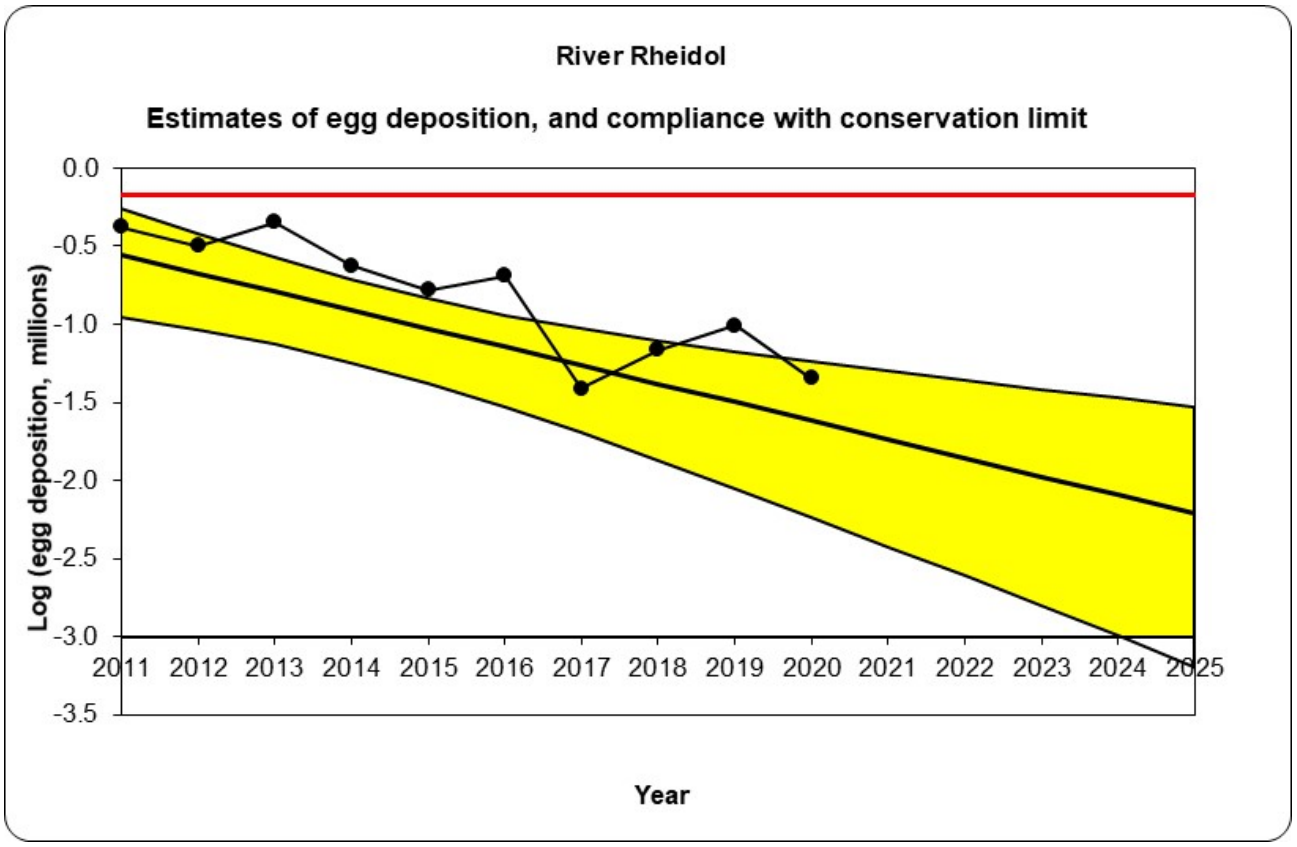


Stock status

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 ten-year series of egg deposition estimates (2011-2020).

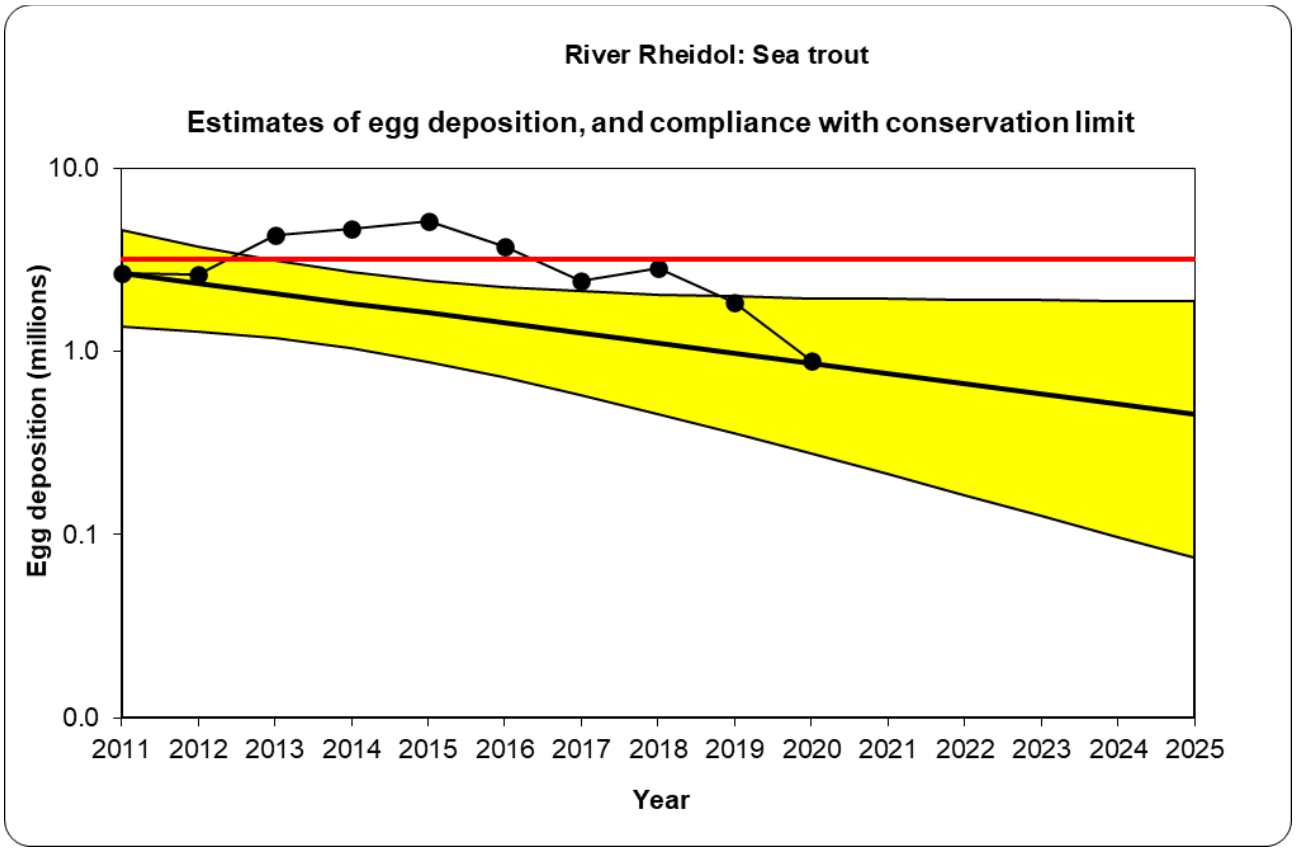
- Current number of eggs being deposited puts stocks **at risk**
- In five years' time the predicted status of salmon stocks will be **at risk**
- Based on current data, and the projection of the graph, the stocks of salmon on the Rheidol will continue to **decline (downward trend)**

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).



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- 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 Rheidol will continue to **declining (uncertain trend)**

Juvenile Salmonid Monitoring Programme

In 2021 the temporal (annual) programme consisted of five sites on the Rheidol. 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.

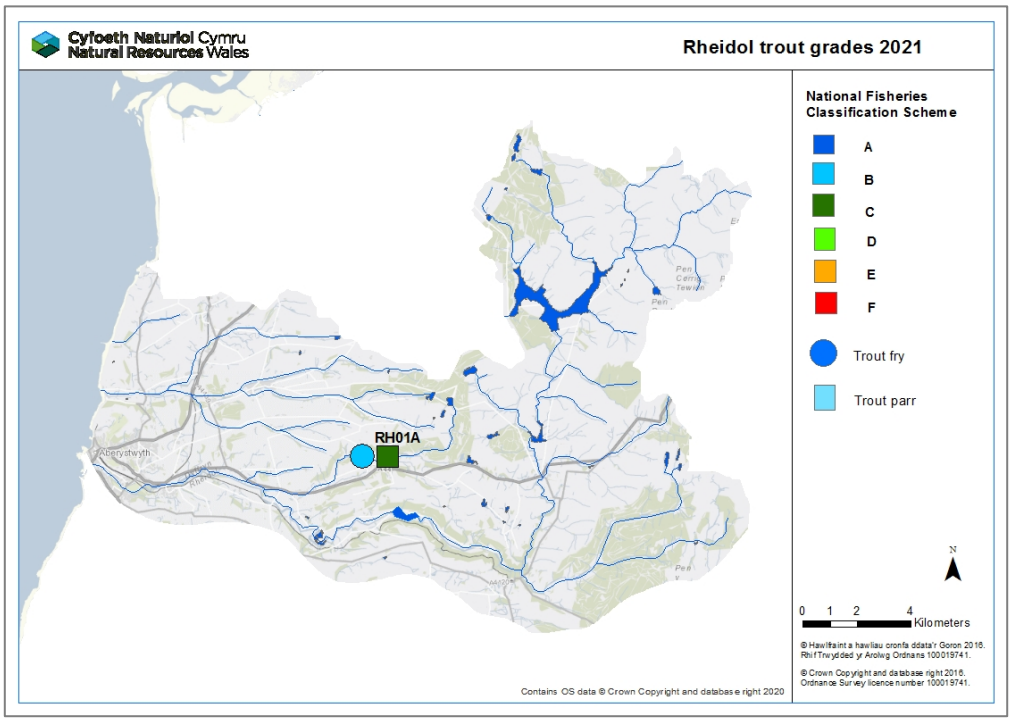
Salmon and Trout Classifications

The tables/maps below show the results of the routine juvenile salmonid population surveys on the Rheidol in 2021. No salmon have historically been caught on the Melindwr.

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
Melindwr	RH01A	2021	**F**	**F**	**A**	**C**

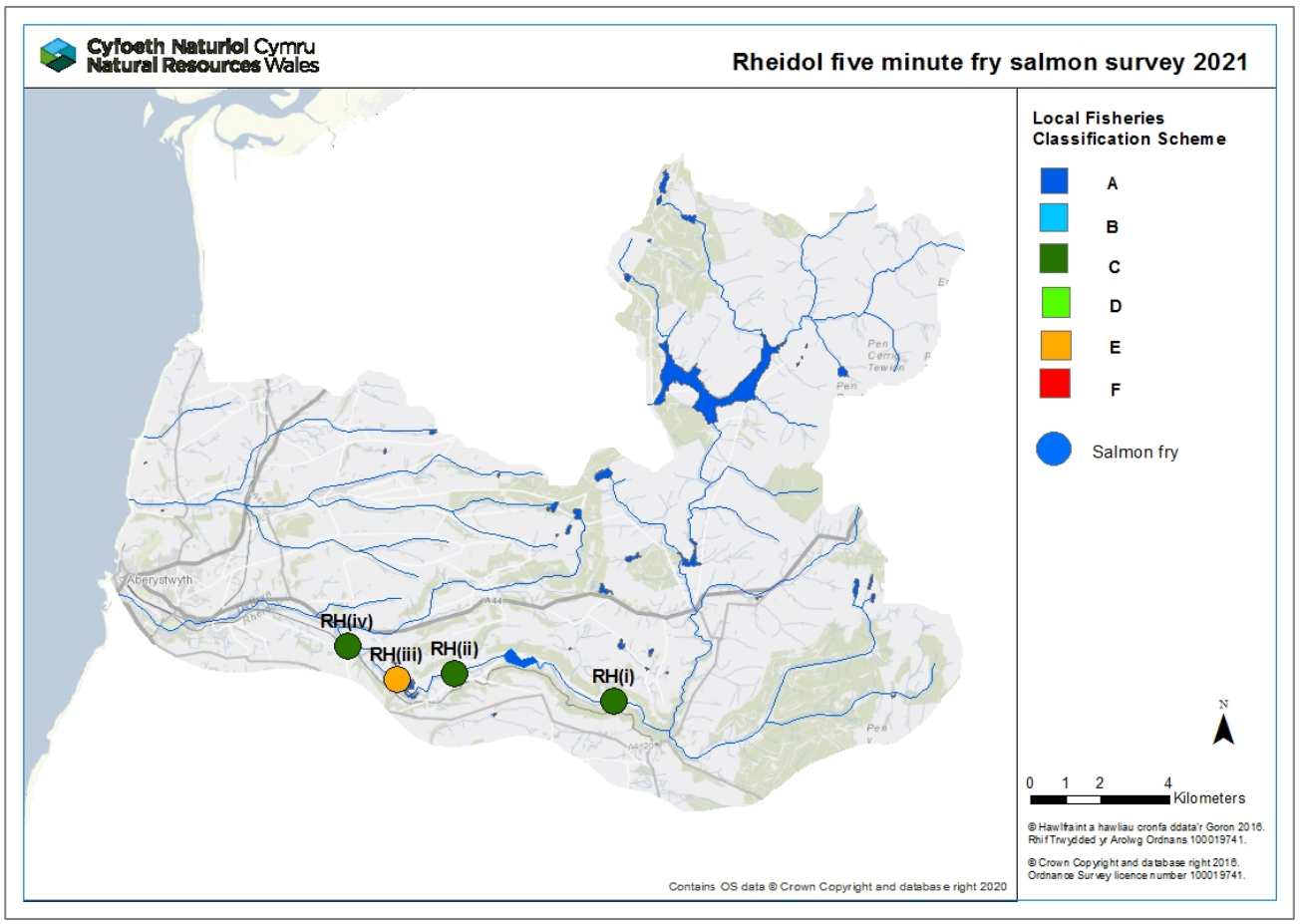


Five Minute Fry Additional Timed Surveys 2021

These surveys are carried out on riffles with the prime target being salmon fry. Fishing is timed for five minutes. The sites are generally on main river and would be too large for a normal survey. North Wales fisheries have created our own grading system for these sites by reviewing the historic data, and this is explained in the table below, with the results underneath.

Grade	Descriptor	Number of salmon fry caught
A	Excellent	25 or more
B	Good	15 to 24
C	Fair	10 to 14
D	Fair	5 to 9
E	Poor	1 to 4
F	Fishless	0

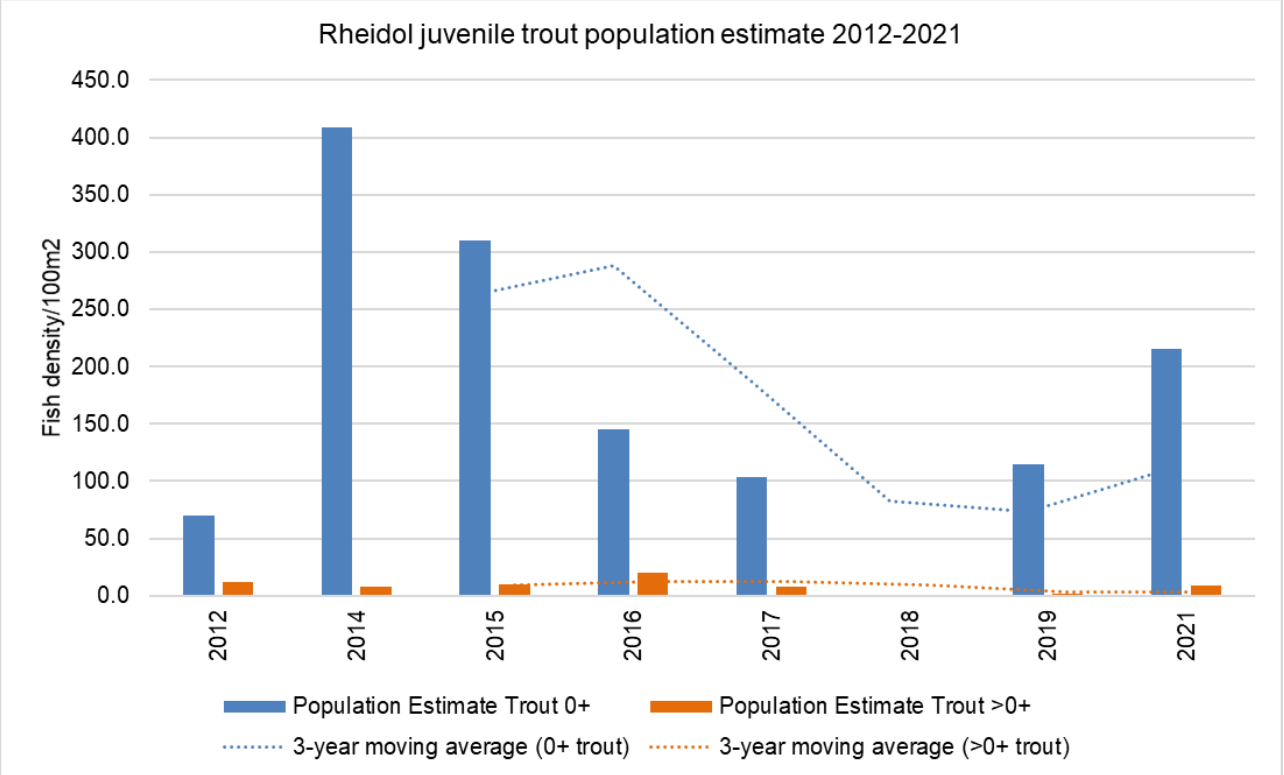
Catchment	Site code	Year	Salmon fry grade
Rheidol	RH (i)	2021	**C**
Rheidol	RH (ii)	2021	**C**
Rheidol	RH (iii)	2021	**E**
Rheidol	RH (iv)	2021	**C**



Catchment Population Trends

The table below shows the average trout density for the temporal site on the Rheidol catchment since 2012. Salmon numbers are not shown as they are rarely caught at this site. NB – no surveys were carried out in 2013 due to an alteration in the programme, zero fish were caught in 2018 as the river had dried out, no surveys were carried out in 2020 due to covid restrictions.

Year	0+ Trout	3-year average (0+ trout)	>0+ Trout	3-year average (0+ trout)
2021	215.1	110.1	8.8	3.7
2019	115.2	73.1	2.2	3.4
2018	0.0	83.0	0.0	9.3
2017	104.0	186.3	8.0	12.7
2016	145.0	287.9	20.0	12.5
2015	309.9	262.8	10.0	9.7
2014	408.9	N/A	7.6	N/A
2012	69.6	N/A	11.5	N/A



Rheidol Fisheries Action Table

Planned actions	Benefits	Lead	Partner(s)	Timescale for delivery
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.	More natural river system, reduced siltation, increased flow diversity, improved spawning gravels and juvenile habitat. Improved fish numbers.	NRW		On-going
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.	Waterbodies protected and improved WFD waterbodies achieving Good Status/Potential.	NRW	NRW Wildlife trusts Local authorities Landowner DCWW	On-going
Enforcement: Action to reduce illegal activity on information provided and investigations.	Reduce illegal activity, more fish remain in the system.	NRW	Stakeholders North Wales Police	On-going
Strategic Allocated Fund (SAF): Partnership with Afonydd Cymru and West Wales Rivers Trust	Work to remove impassable barriers to fish migration: Removal of woody debris and plastic blockage Measures will increase spawning success and juvenile production.	NRW	AC WWRT	Completed 2020/21
Strategic Allocated Fund (SAF): Partnership with Afonydd Cymru and West Wales Rivers Trust	Removal of impassable barriers to fish migration. Measures will increase access to spawning habitat, therefore spawning	NRW	AC WWRT	2022/23

	success and juvenile production.			
Fisheries Habitat Restoration Plans	Investigation in partnership with Afonydd Cymru and West Wales Rivers Trust, to determine all current constraints to salmon habitat within the catchments. This report will be used as a basis for future funding bids by NRW/AC/WWRT	NRW	AC WWRT	Completed 2020/21
Cwm Rheidol dam improvements	Investigation into potential measures to improve fish migration. Measures will increase access to spawning habitat, spawning success, juvenile production and passage of juveniles back to sea.	Statkraft	NRW Aberwystwth Angling Association	2022-23