Know Your River – Clwyd
Salmon & Sea Trout Catchment Summary

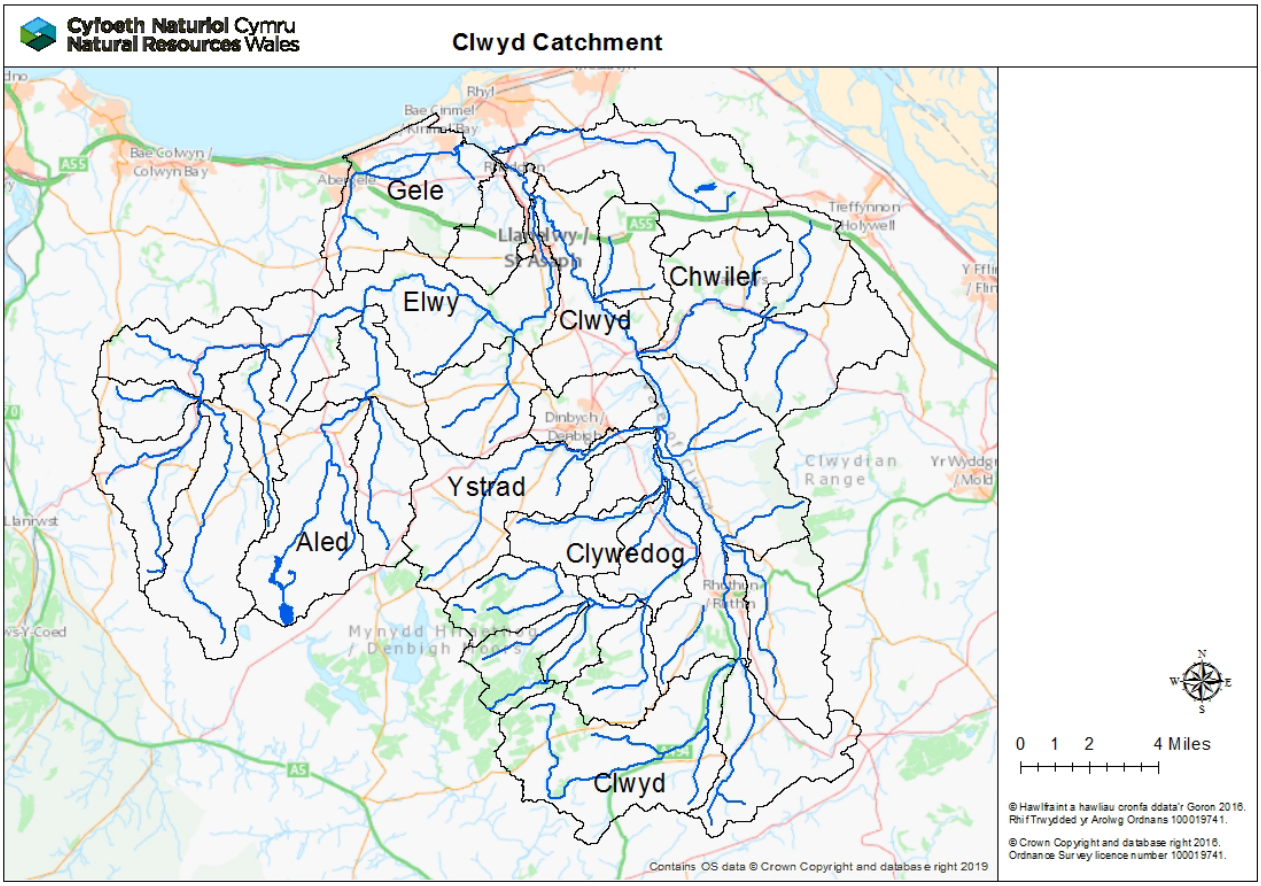
Introduction

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.

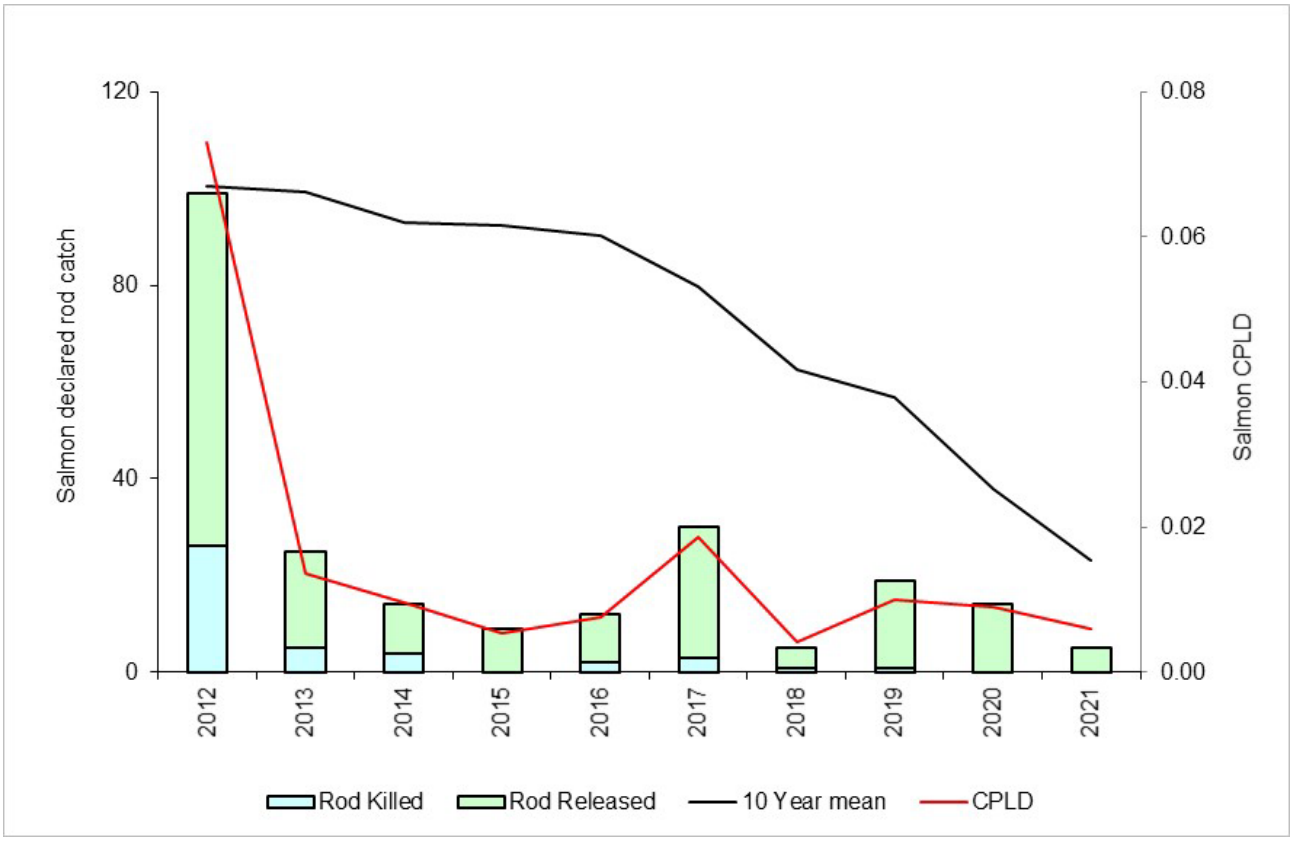
Abstraction for public water supply has developed across the area to meet the rising demands over the last hundred years or so. For the most part water is supplied from high level sources e.g. Llyn Aled, Llyn Aled Isaf, Plas Uchaf and Dolwen. Rhyl and Prestatyn rely heavily on groundwater resources. 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 tables/graphs show the total declared rod catches of salmon and sea trout on the Clwyd 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
2021	5	0	5	23.2	100	0.006
2020	14	0	14	38.0	100	0.009
2019	19	1	18	56.7	95	0.010
2018	5	1	4	62.7	80	0.004
2017	30	3	27	79.8	90	0.019
2016	12	2	10	90.3	83	0.008
2015	9	0	9	92.2	100	0.005
2014	14	4	10	93.1	71	0.010
2013	25	5	20	99.4	80	0.014
2012	99	26	73	100.4	74	0.073



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Sea Trout Rod Catch

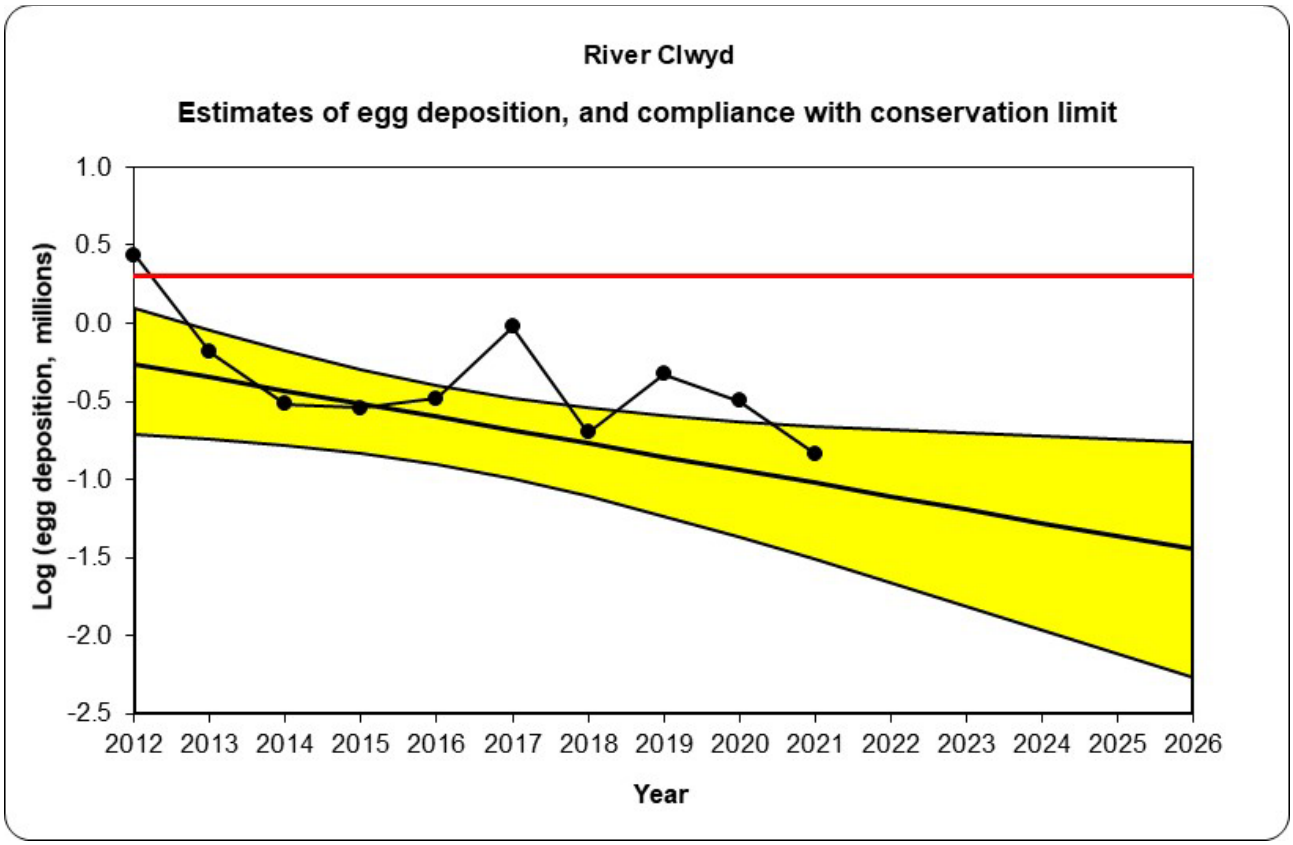
Year	Caught	Rod Killed	Rod Released	10 Year mean	Percentage released	Catch per license day
2021	324	38	286	821	88	0.366
2020	482	57	425	885.4	88	0.313
2019	823	84	739	986.1	90	0.430
2018	323	33	290	991.8	90	0.260
2017	1063	146	917	1054.4	86	0.650
2016	777	117	660	1020.9	85	0.490
2015	1097	142	955	1020.9	87	0.643
2014	1159	179	980	960.7	85	0.766
2013	752	111	641	953.3	85	0.391
2012	1410	240	1170	976.3	83	0.635

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 (2012-2021).

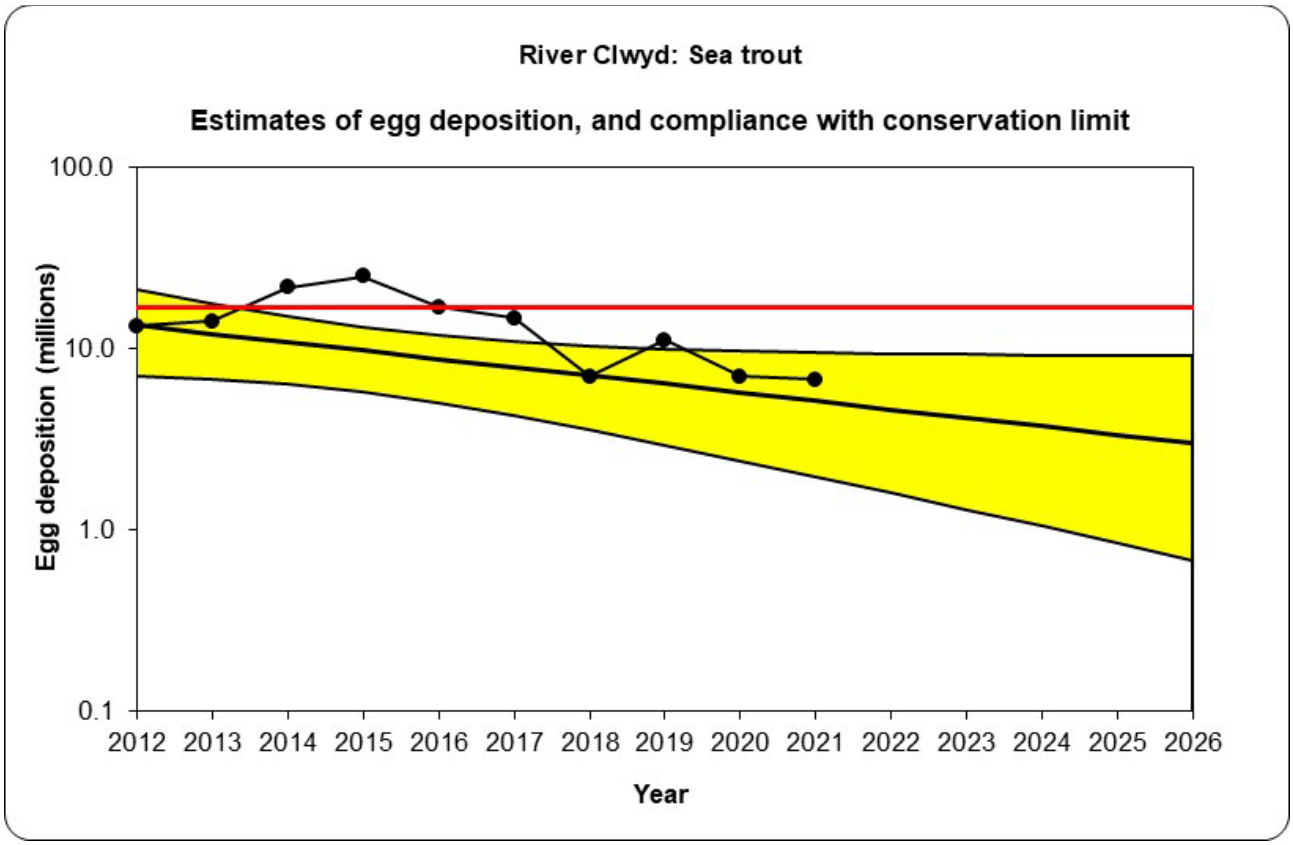
- Current number of eggs being deposited puts stocks **at risk**
- In five years' time the predicted status of salmon stocks will be **at risk**
- Based on current data, and the projection of the graph, the stocks of salmon on the Clwyd will continue to **decline (downward trend)**

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).



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 Clwyd will continue to **decline (uncertain trend)**

Juvenile Salmonid Monitoring Programme

In 2022 the temporal (annual) programme consisted of five sites on the Clwyd. 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 following tables/maps show the results of the routine juvenile salmonid population surveys from 2022 on the Clwyd.

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
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
Aled	1	2022	**F**	**F**	**A**	**D**
Clwyd	9	2022	**F**	**F**	**C**	**A**
Clywedog	14	2022	**F**	**F**	**B**	**C**
Elwy	123	2022	**E**	**F**	**B**	**D**
Ystrad	109	2022	**F**	**F**	**C**	**F**

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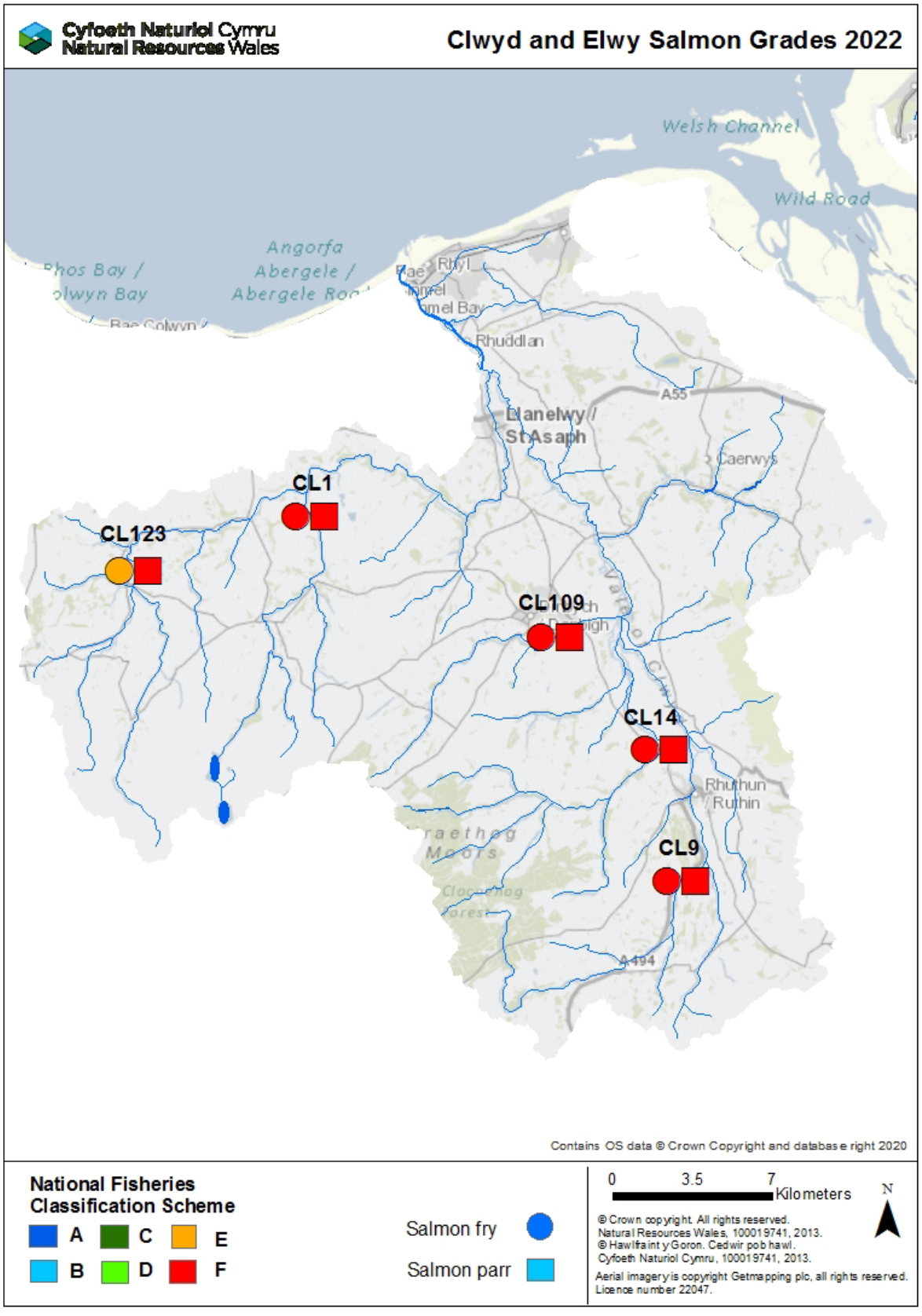
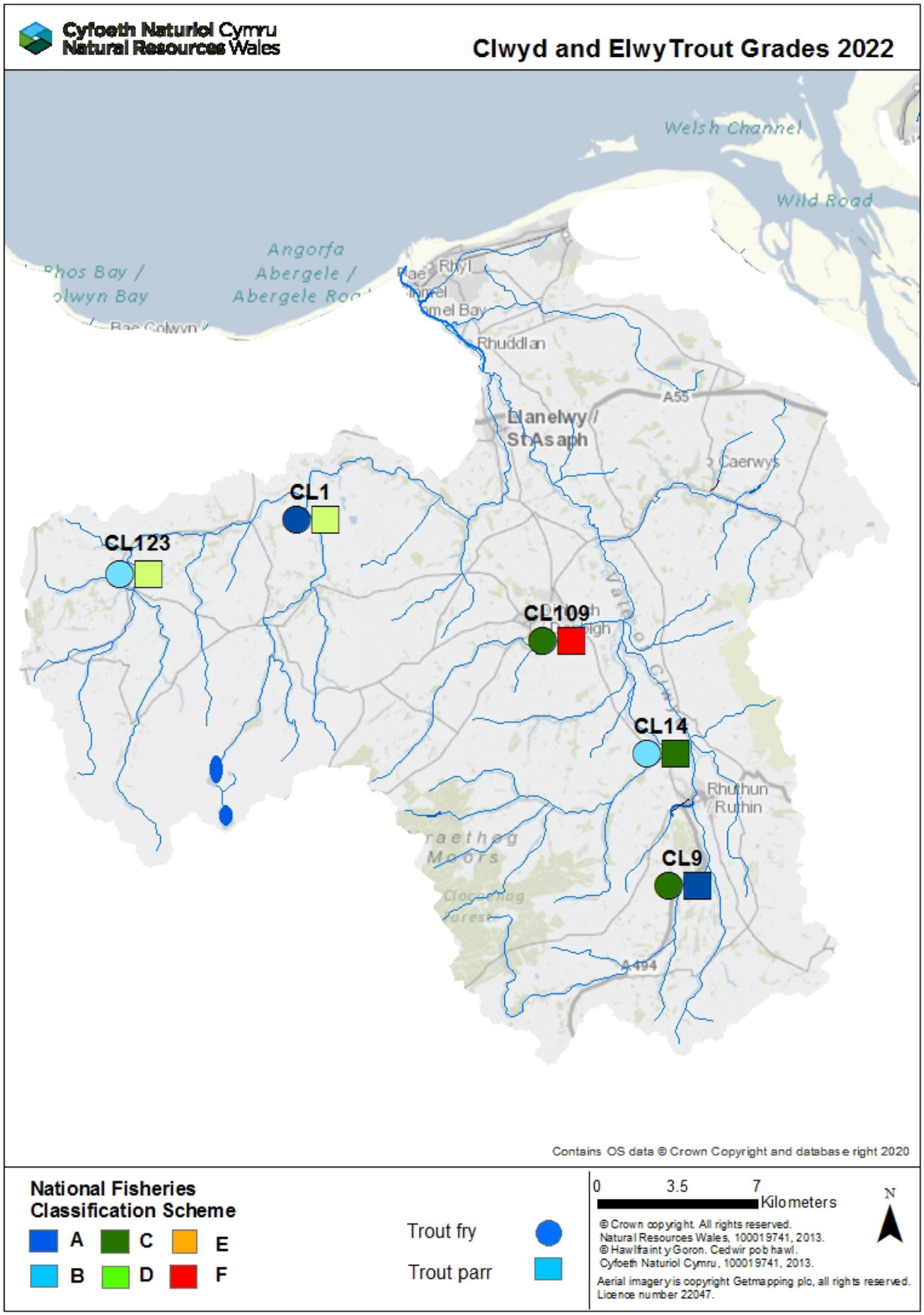
Map of Juvenile Salmon Results



Map of Juvenile Trout Results

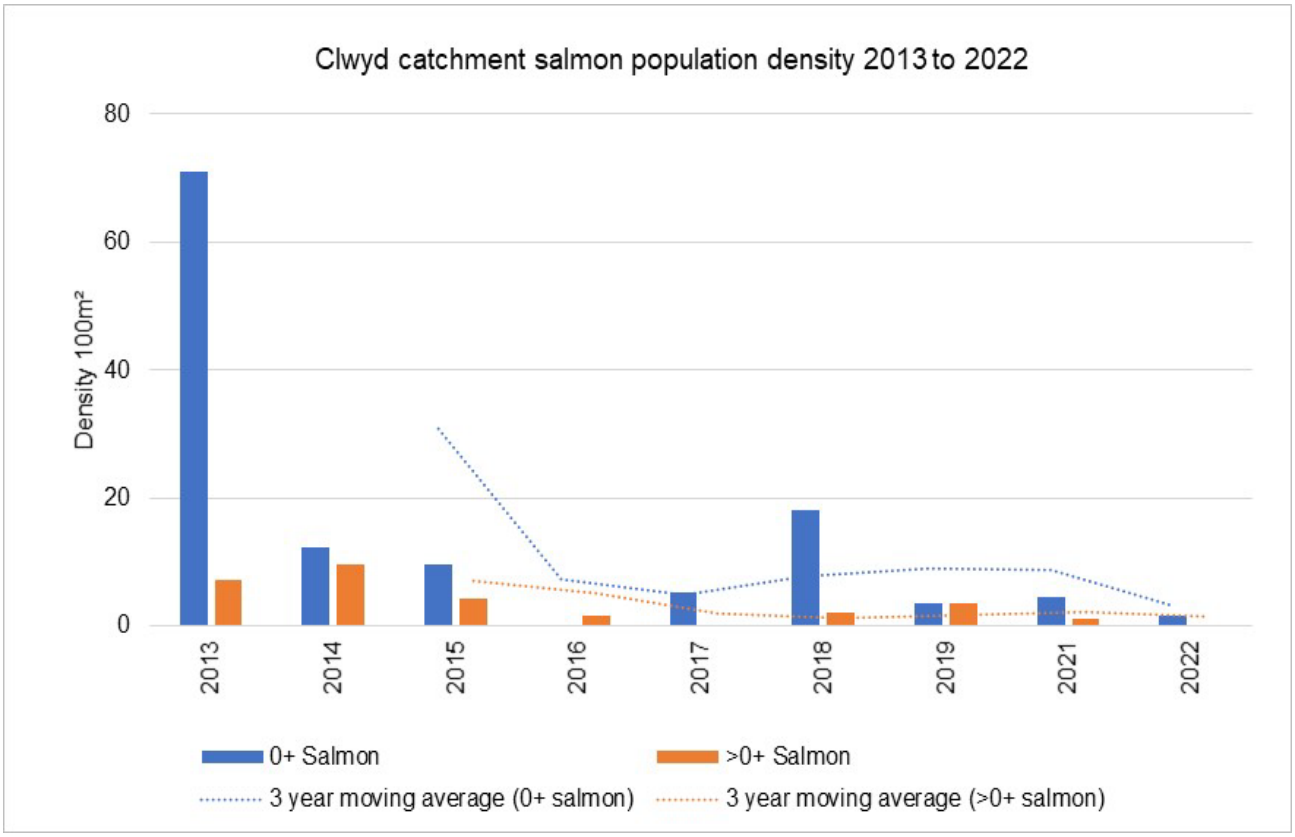


Catchment Population Trends

The tables/graphs below show a simple comparison of average salmon and trout densities across the temporal sites on the Clwyd catchment since 2013. NB – covid restrictions cancelled all surveys in 2020. NA stands for not applicable.

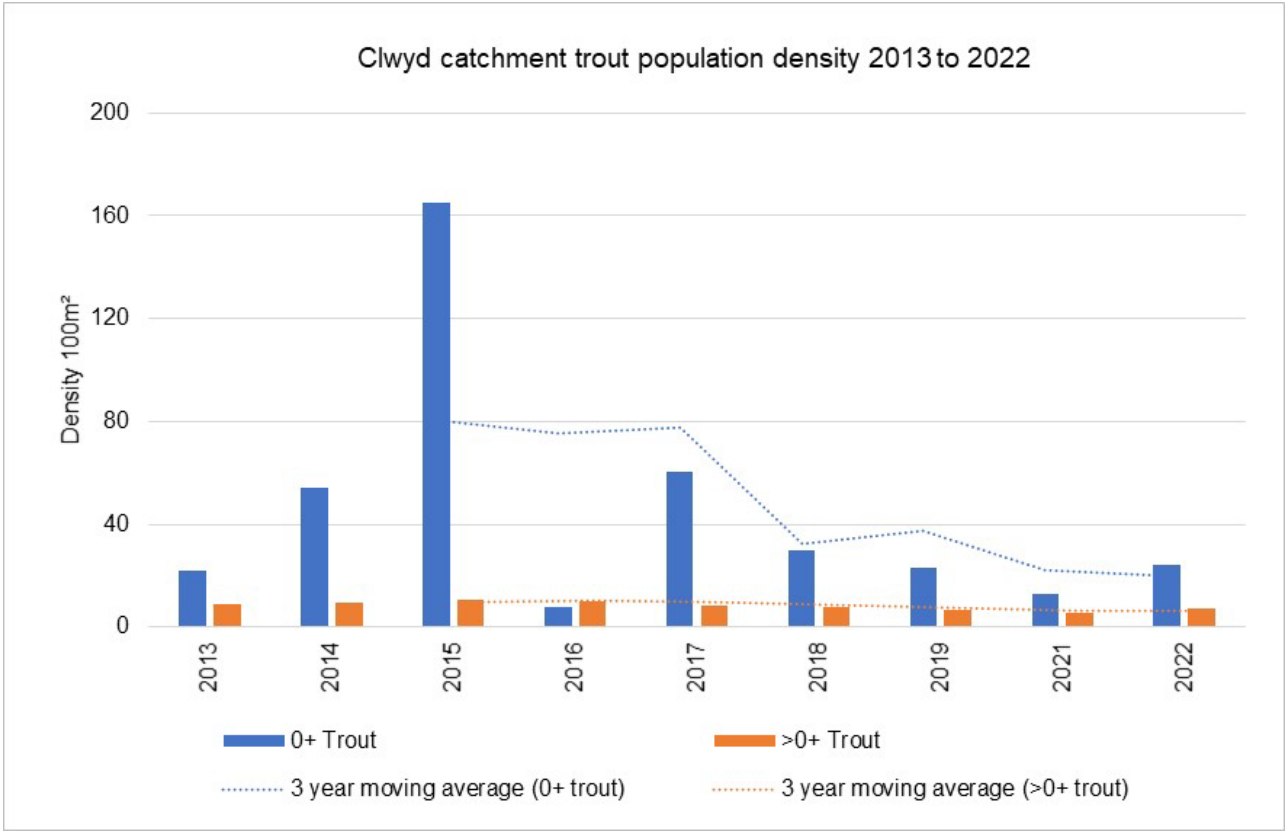
Salmon population trend

Year	0+ Salmon	3-year average (0+ salmon)	>0+ Salmon	3-year average (>0+ salmon)
2022	1.5	3.2	0	1.6
2021	4.5	8.7	1.3	2.3
2019	3.6	9.0	3.6	1.9
2018	18.1	7.8	2.0	1.3
2017	5.3	4.9	0.0	2.0
2016	0.0	7.3	1.7	5.2
2015	9.6	30.9	4.4	7.0
2014	12.3	NA	9.6	NA
2013	70.9	NA	7.2	NA



Trout population trend

Year	0+ Trout	3-year average (0+ trout)	>0+ Trout	3-year average (>0+ trout)
2022	24.5	20.2	7.0	6.5
2021	13.1	22.0	5.5	6.6
2019	23.0	37.8	6.8	7.6
2018	29.8	32.6	7.5	8.7
2017	60.4	77.6	8.4	9.7
2016	7.6	75.6	10.1	10.1
2015	164.9	80.3	10.7	9.7
2014	54.2	NA	9.4	NA
2013	21.9	NA	9.1	NA



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Clwyd Fisheries Action Table

Planned actions	Benefits	Lead	Partner(s)	Timescale for delivery
Bontuchel fish pass: modifications to operation of fish pass	Improved safety and ease of operation for the fish pass	NRW		2022-23
Dolwen fish easement: modification to culvert	Improved fish passage through culvert to spawning areas	NRW		2022-23
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