

Know Your River – Conwy

Salmon & Sea Trout Catchment Summary

Introduction

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

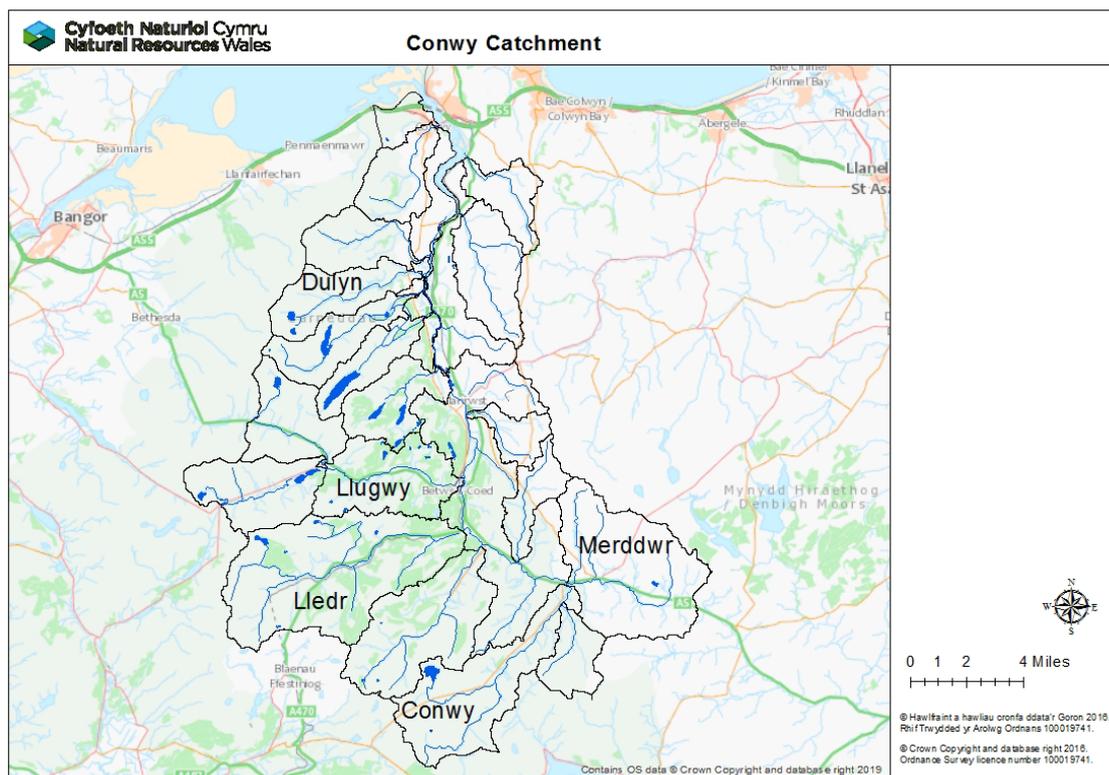
Action tables set out habitat improvements to restore freshwater productivity of salmon and sea trout populations. These tables also include some work which will be carried out by our partner organisations, not just Natural Resources Wales (NRW).

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 Conwy rises from Llyn Conwy in the Migneint Moors in Snowdonia and drains a predominantly upland catchment discharging into Liverpool Bay at Conwy. The catchment is mainly rural with limited industrial development. Land use is dominated by agriculture (75%), mainly sheep grazing with some dairy farming, and coniferous afforestation (12%). Tourism also plays an important role in the local economy.



The 'hard' Ordovician rocks in the south and west areas of the catchment have given rise to thin, poorly buffered soils that are susceptible to the effects of acidification. The weather resistance of these rocks has also given rise to steep slopes that have rendered most of the sub catchments in the south-western area inaccessible to migratory fish. In contrast, the geology of the north-eastern area of the catchment provides more buffering which reduces acid sensitivity.

Abandoned metal mine shafts, adits and spoil heaps act as point sources of metal contamination in parts of the Gwydyr forest just north of Betws y Coed. This contamination has a localised impact upon the Nant Gwydyr and minor tributaries of the lower Llugwy.

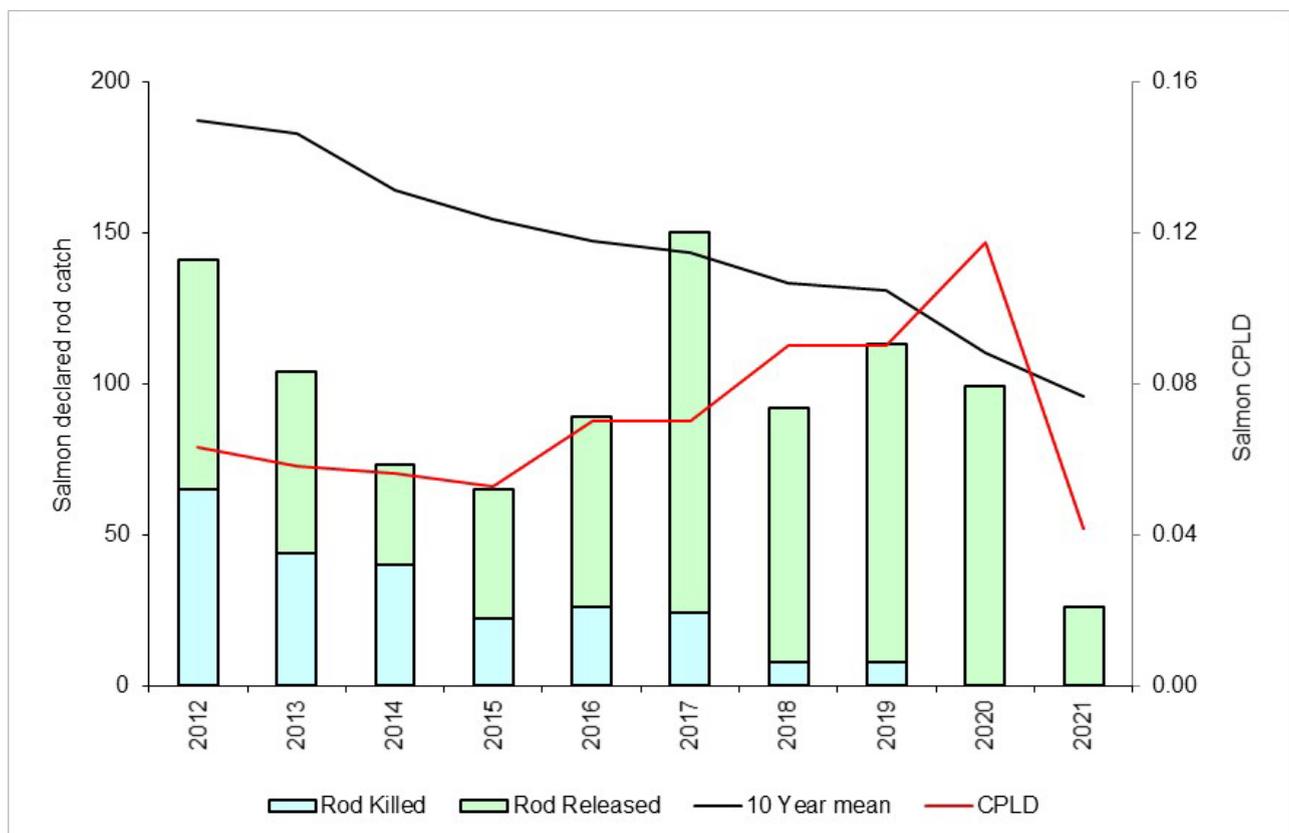
The Conwy falls fish pass was constructed in compensation for any disturbance to the Conwy's fisheries during the construction of the A55 expressway tunnel at Conwy. This was opened in 1994 and opened an additional 40% of spawning and nursery area within the catchment.

Rod Catches

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

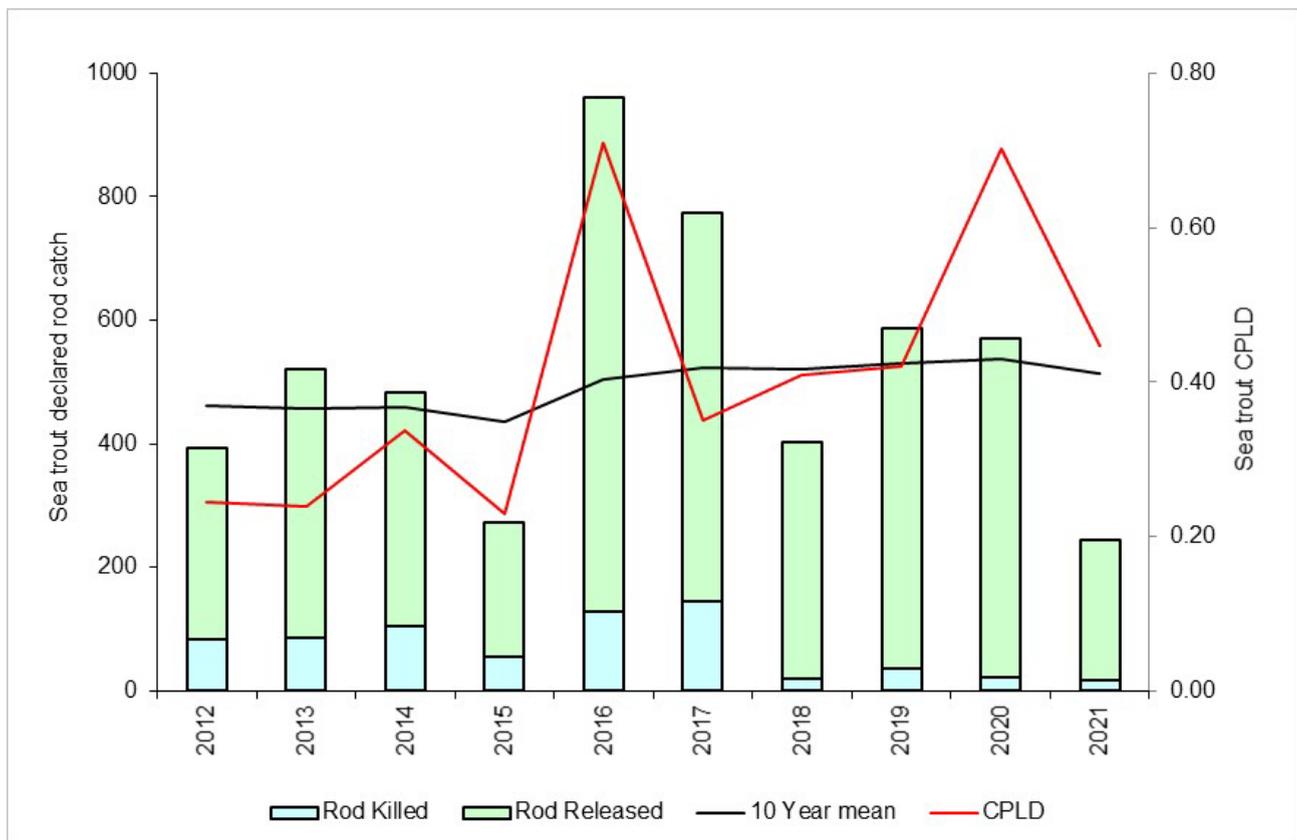
Salmon Rod Catch

Year	Caught	Rod Killed	Rod Released	10 Year mean	Percentage released	Catch per license day
2021	26	0	26	95.8	100	0.042
2020	99	0	99	110.4	100	0.119
2019	119	9	110	130.9	93	0.094
2018	92	8	84	133.4	91	0.094
2017	150	24	126	143.2	84	0.069
2016	89	26	63	147.4	71	0.070
2015	65	22	43	154.2	66	0.053
2014	73	40	33	163.9	45	0.056
2013	104	44	60	182.6	58	0.058
2012	141	65	76	186.9	54	0.063



Sea Trout Rod Catch

Year	Caught	Rod Killed	Rod Released	10 Year mean	Percentage released	Catch per license day
2021	245	18	227	513.5	93	0.446
2020	570	37	547	529.7	96	0.713
2019	586	23	549	537.2	94	0.420
2018	402	19	383	520.4	95	0.411
2017	774	145	629	523.6	81	0.350
2016	961	128	833	504.7	87	0.710
2015	272	56	216	436.8	79	0.229
2014	482	106	376	458.5	78	0.337
2013	521	86	435	457.1	83	0.240
2012	392	84	308	462.2	79	0.244

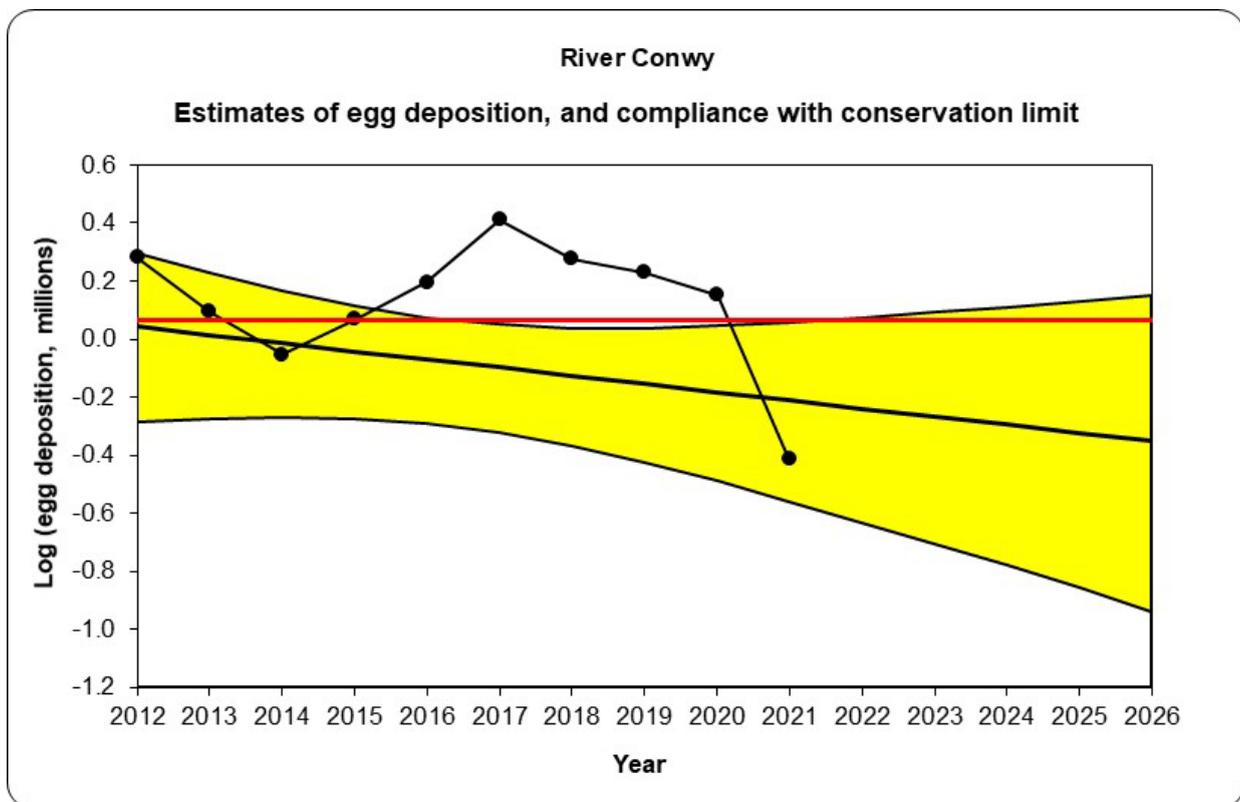


Stock status

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).

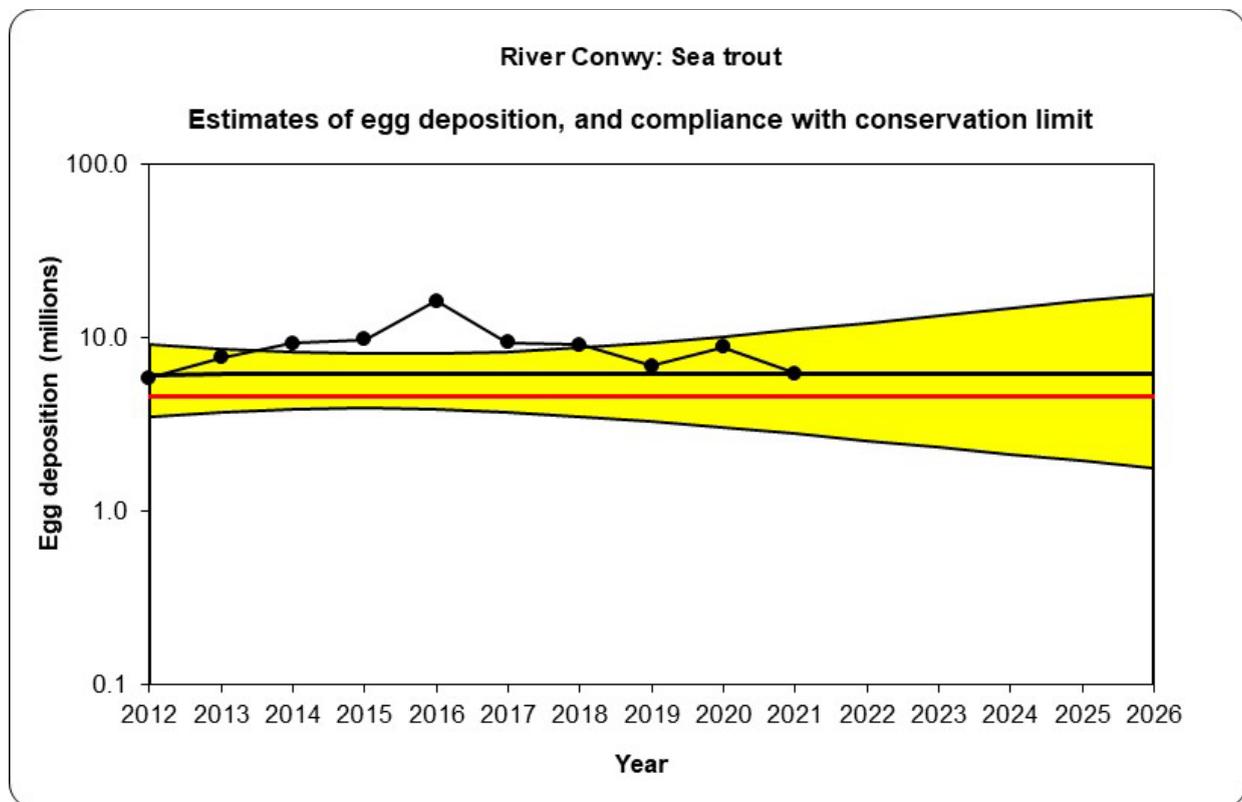
- Current number of eggs being deposited puts stocks **at risk**
- In five years' time the predicted status of salmon stocks will be **probably at risk**
- Based on current data, and the projection of the graph, the stocks of salmon on the Conwy will continue to **decline (uncertain trend)**

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 **probably not at risk**
- In five years' time the predicted status of salmon stocks will be **probably not at risk**
- Based on current data, and the projection of the graph, the stocks of sea trout on the Conwy will continue to **decline (uncertain trend)**

Juvenile Salmonid Monitoring Programme

In 2022 the temporal (annual) programme consisted of four sites on the Conwy. 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

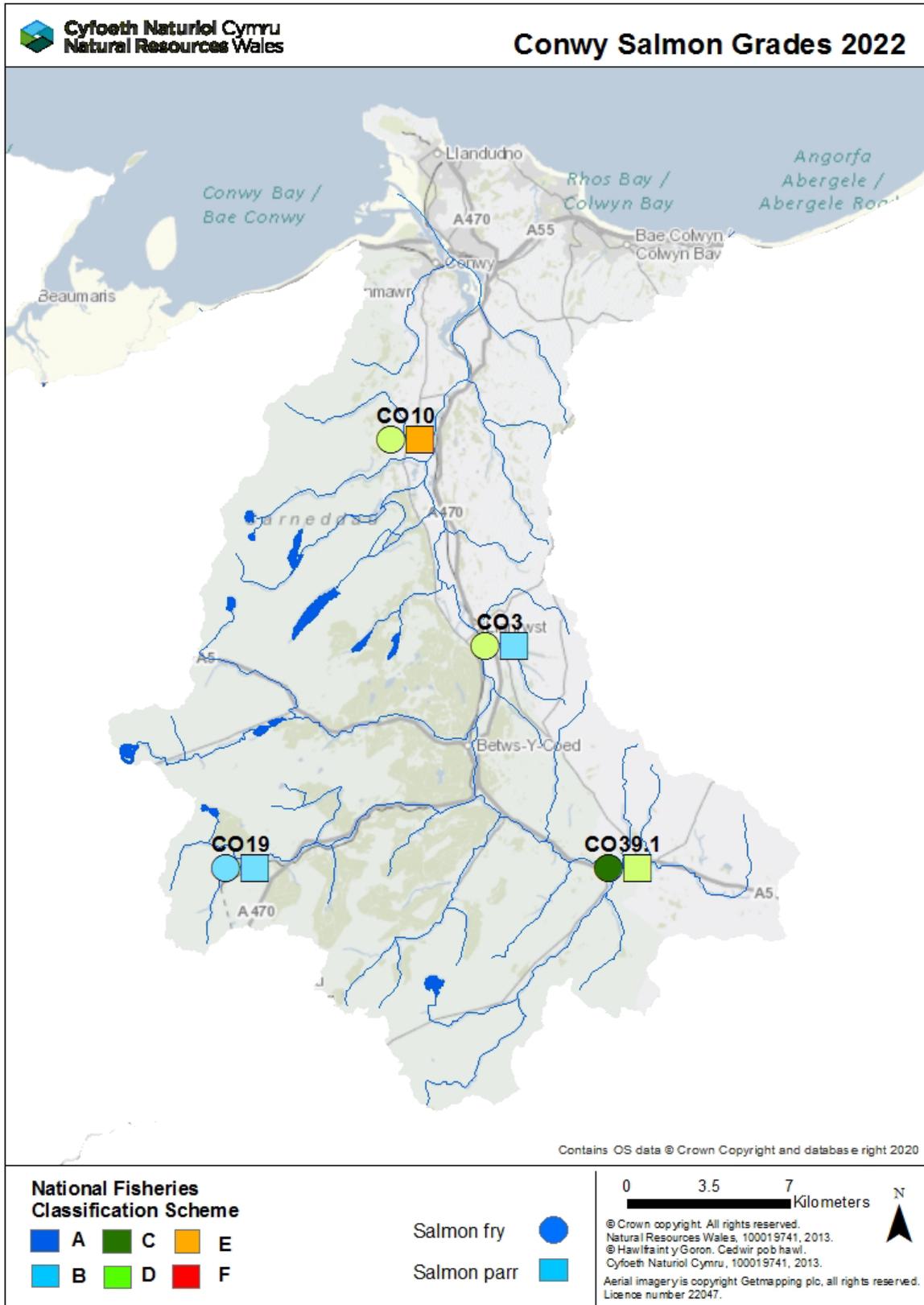
The following table/maps present the results of the routine juvenile salmonid population surveys from 2022 on the Conwy.

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.

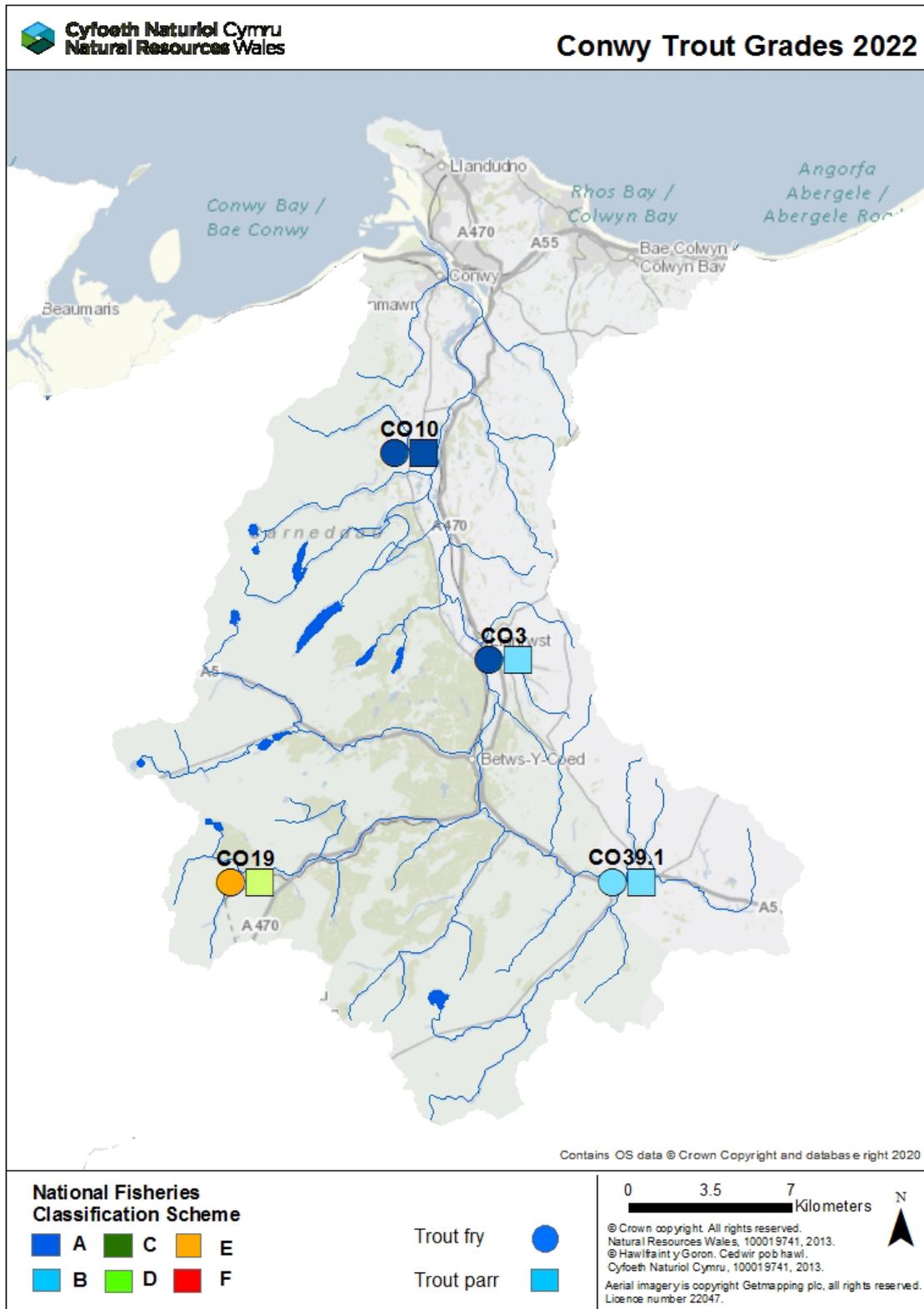
Grade	Descriptor	Interpretation
A	Excellent	In the top 20% for a fishery of this type
B	Good	In the top 40% for a fishery of this type
C	Fair	In the middle 20% for a fishery of this type
D	Fair	In the bottom 40% for a fishery of this type
E	Poor	In the bottom 20% for a fishery of this type
F	Fishless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

Catchment	Site code	Year	Salmon fry grade	Salmon parr grade	Trout fry grade	Trout parr grade
Nant Y Goron	3	2022	D	B	A	B
Roe	10	2022	D	E	A	A
Lledr	19	2022	B	B	E	D
Merddwr	39.1	2022	C	D	B	B

Map of Juvenile Salmon Results



Map of Juvenile Trout Results

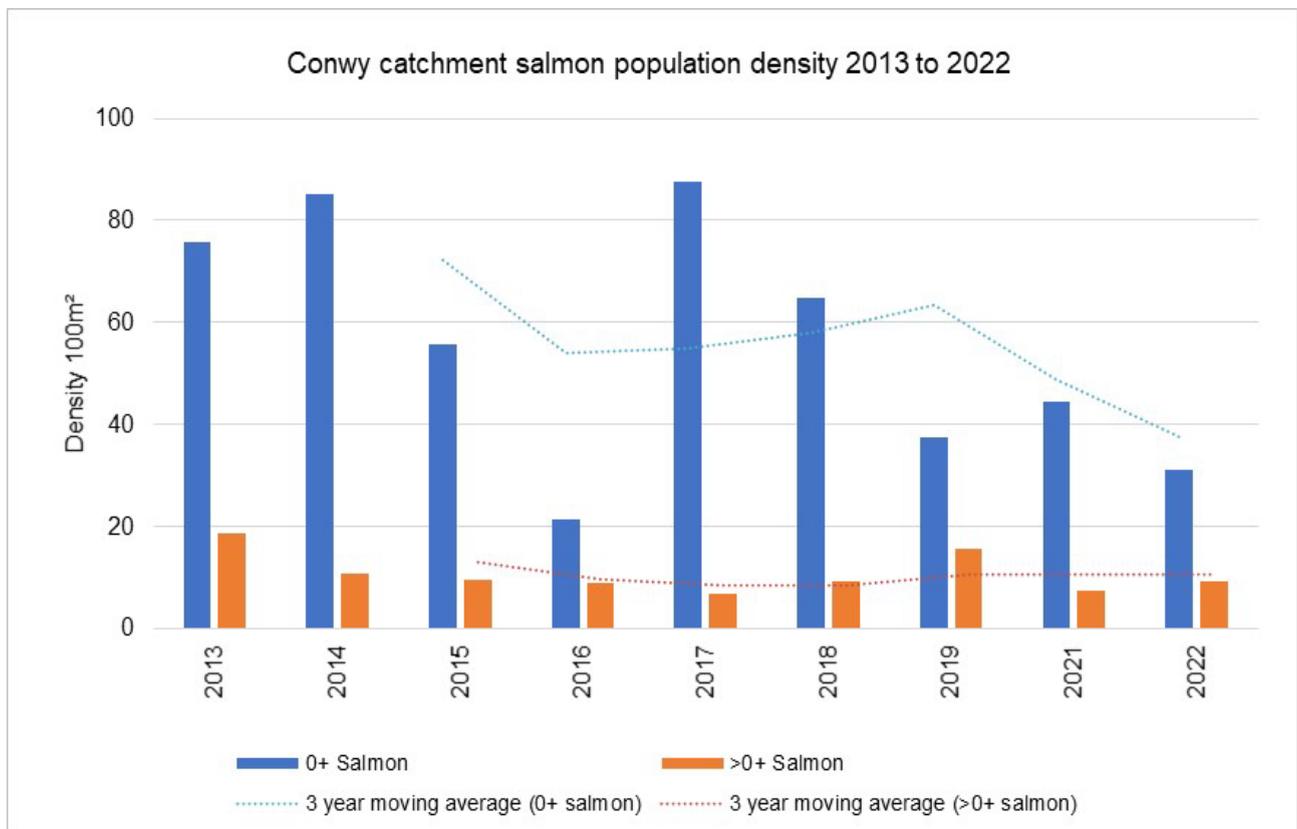


Catchment Population Trends

The tables/graphs below shows the average salmon and trout densities from the temporal sites across the Conwy catchment since 2013. NB – covid restrictions cancelled all surveys in 2020. NA stands for not applicable.

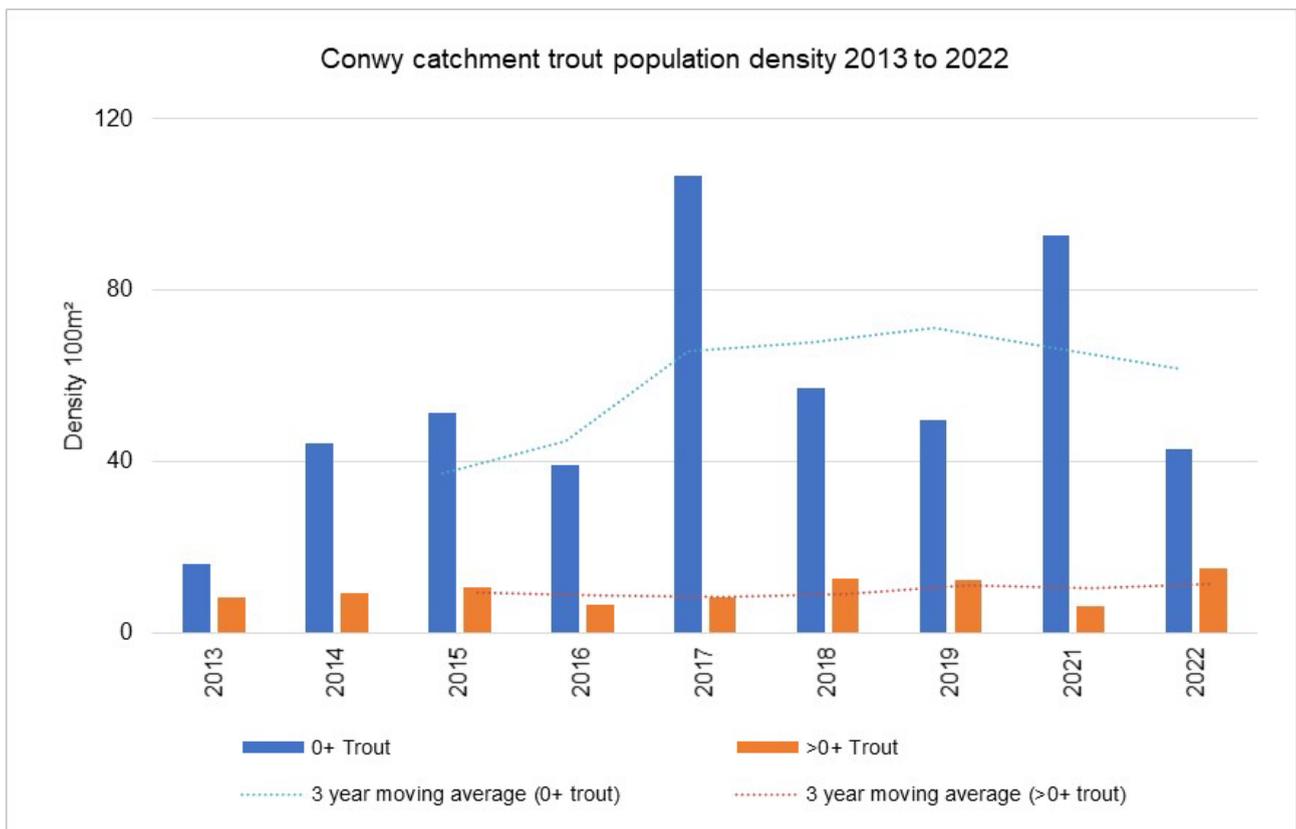
Salmon population trend

Year	0+ Salmon	3-year average (0+ salmon)	>0+ Salmon	3-year average (>0+ salmon)
2022	31.3	37.8	9.3	10.8
2021	44.7	49.0	7.4	10.8
2019	37.5	63.4	15.6	10.7
2018	65.0	58.0	9.4	8.5
2017	87.6	54.8	7.0	8.6
2016	21.3	54.1	9.2	9.9
2015	55.6	72.2	9.8	13.1
2014	85.3	NA	10.8	NA
2013	75.6	NA	18.7	NA



Trout population trend

Year	0+ Trout	3-year average (0+ trout)	>0+ Trout	3-year average (>0+ trout)
2022	42.8	61.8	15.2	11.3
2021	92.9	66.6	6.3	10.5
2019	49.6	71.2	12.5	11.2
2018	57.2	67.7	12.7	9.2
2017	106.7	65.7	8.2	8.5
2016	39.2	44.9	6.7	8.9
2015	51.2	37.2	10.7	9.3
2014	44.3	NA	9.2	NA
2013	16.2	NA	8.1	NA



Conwy Fisheries Action Table

Planned actions	Benefits	Lead	Partner(s)	Timescale for delivery
Uwch Conwy project – Upper Conwy - improve land management and water quality. Work in 2022 focused on restoring peat land, hedgerow creation as well as river restoration projects on the Caletwr, Nant y Gwryd and Machno. Monitoring and feasibility studies are going ahead on sites in the Llugwy, Lledr and Machno to enable work in future years	More natural river system, reduced siltation, increased flow diversity, improved spawning gravels and juvenile habitat. Improved fish numbers.	NRW	NRW & National Trust	On-going
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