Dee Stock Assessment Programme Anglers Report 2025

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We will realise this vision by:

- Maintaining and developing the technical specialist skills of our staff;
- Securing our data and information;
- Having a well-resourced proactive programme of evidence work;
- Continuing to review and add to our evidence to ensure it is fit for the challenges facing us; and
- Communicating our evidence in an open and transparent way.

This Evidence Report series serves as a record of work carried out or commissioned by Natural Resources Wales. It also helps us to share and promote use of our evidence by others and develop future collaborations. However, the views and recommendations presented in this report are not necessarily those of NRW and should, therefore, not be attributed to NRW.

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Welsh Dee Logbook Anglers

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Crynodeb gweithredol

Mae'r Adroddiad Pysgota hwn ar gyfer Afon Dyfrdwy yn un o gyfres sydd wedi'i chynhyrchu gan Gyfoeth Naturiol Cymru (CNC) dros y blynyddoedd diwethaf. Gellir gweld adroddiadau blaenorol yma.

Ei brif bwrpas yw rhoi adborth blynyddol i bysgotwyr ac eraill ar ganfyddiadau'r rhaglen fonitro hirdymor ar gyfer eog a brithyll môr, sy'n cael ei chynnal ar Afon Dyfrdwy ers dechrau'r 1990au.

Mae'r adroddiad yn disgrifio nodau ac amcanion eang rhaglen Afon Dyfrdwy, ochr yn ochr â gwybodaeth am allbynnau a gweithgareddau monitro allweddol. Mae fformat yr adroddiad yn parhau i fod yn debyg flwyddyn ar ôl blwyddyn, ond bydd adrannau'n cael eu diweddaru i gyd-fynd â'r canlyniadau diweddaraf.

Executive summary

This Dee Angler Report is one of a series produced by Natural Resources Wales (NRW) in recent years. Past reports can be seen here.

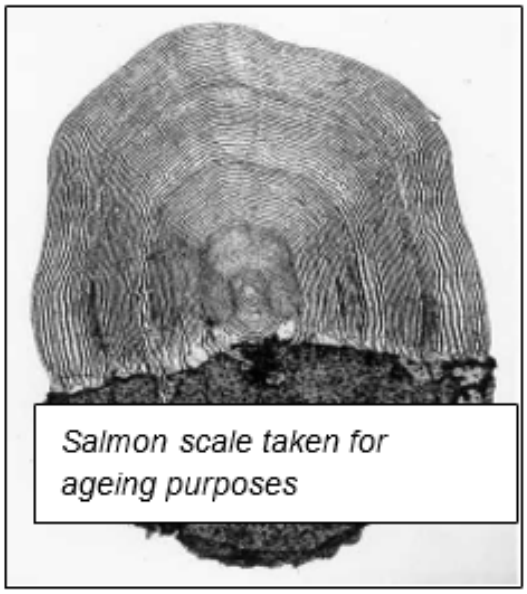
Its main purpose is to provide annual feedback to fishermen and others on findings from the long-term monitoring programme for salmon and sea trout undertaken on the River Dee since the early 1990s
.
The report describes the broad aims and objectives of the Dee programme alongside information on key monitoring activities and outputs. The format of the report remains similar year-on-year, but with sections updated to take account of the latest results.

The Dee programme

The River Dee is one of very few 'index' monitored rivers for Atlantic salmon and sea trout in Europe or the wider North Atlantic area. It is the only index river in Wales and a Special Area of Conservation for salmon under the EU Habitats Directive.

Index rivers are characterised by their intensive and long-term monitoring programmes collecting unique information on the key life-stages of these important fish species.

Over time, this builds a picture of changes in abundance and biology which helps to improve our understanding of complex population processes and the factors which influence them.



In turn, this detailed information is used to inform stock assessment and fisheries and environmental management in the widest sense: locally, nationally and internationally. Hence the benefits of this type of intensive monitoring programme are not just confined to the index rivers.

The index river programme on the Dee - or ‘Dee Stock Assessment Programme’ (DSAP) - began in 1991 with construction of a head-of-tide fish trap at Chester Weir.

This trap is designed to capture and sample upstream migrating adult fish to estimate their total return, as well as provide information on their biology (e.g. size, age, sex, etc.). Further details of the trapping programme are given below.

Rotary Screw Trap used to capture smolts on the lower Dee

Other elements of the Dee programme include:

(i) lower river downstream trapping programmes in spring to estimate the abundance and
survival of out-migrating smolts;

(ii) extensive (5-minute timed) electrofishing surveys in late summer to monitor the abundance and distribution of juvenile salmon and trout (fry and parr) at 85+ tributary and main river sites.

(iii) circulation (with this report) of a fishing logbook to Dee anglers to collect detailed information on rod catch and fishing effort around the catchment - supplementing the licence-based catch return and fostering support for the Dee programme including the reporting of tagged fish.

Trapping and tagging at Chester Weir

Very few rivers have facilities (counters or traps) to estimate the numbers of salmon or sea trout returning each year. Out of more than 60 principal salmon rivers and around 80 principal sea trout rivers in England and Wales (E&W), only 10 currently provide run estimates for salmon (including the Taff, Teifi and Dee in Wales) and just 4 produce the same estimates for sea trout (only the Dee in Wales, although, in recent years, run estimates for larger sea trout have been produced for the Teifi). Among these rivers, four 'index' rivers: Tyne, Frome, Tamar and Dee, also collect biological information from adult fish via trapping or fishery-based sampling programmes (of which the Dee is one of the longest running).

Chester Weir fish trap

Trapping at Chester Weir is carried out throughout the year (January to December) but not continuously. When the trap is not being fished (~50% of the time) it becomes an 'open channel' through which fish can freely pass. For this reason, and because fish are able to cross the weir and bypass the trap in high flows and on big (~9m) tides, the trap is a

‘partial’ one. Tagging and recapture estimates (below) indicate that, on average, 20-30% of the run is trapped at Chester.

Virtually all salmon and the majority of sea trout captured at Chester Weir are tagged using Floy and VI (Visible Implant) tags, respectively (see photos on inside front cover). In both cases, run estimates require a second catch from which the ratio of tagged to untagged fish can be obtained. For salmon, this relies on anglers reporting the tagged and untagged fish they catch in the same year they were tagged. In the case of sea trout, however, (where, unlike salmon, multiple spawners are common) the second catch takes place back at Chester trap one year after tagging. In both instances, the ratio of tagged to untagged fish in the second catch is used to raise the total number tagged to obtain a run estimate. For example, if 1,000 salmon were tagged at Chester Trap, and 1 in 5 of the salmon caught by anglers were tagged, then it is assumed that 1/5th of the run has been tagged - producing a run estimate at Chester of 5,000 fish.

This tagging and recapture method means that run estimates for salmon and sea trout can be obtained from a partial trapping programme; i.e. they do not require trapping to be carried out all the time and can account for variations in trap efficiency (as the latter can be estimated from tagging).

A £10 reward is offered to encourage anglers to report any tagged salmon they catch. This reward is increased to £20 for anglers who returned a logbook in the previous season. The reason for this is that records of tagged and untagged salmon submitted by logbook anglers are considered the most reliable - simply because of the diligence required to maintain a detailed record of each fishing visit. Hence, only the catch and recapture details from logbook anglers are used to generate salmon run estimates.

The run of salmon entering the Dee after the end of the angling season (on average around 5% or less of the total) is derived from the trap catch and an estimate of trap efficiency from the in-season period.

Dee salmon in 2024

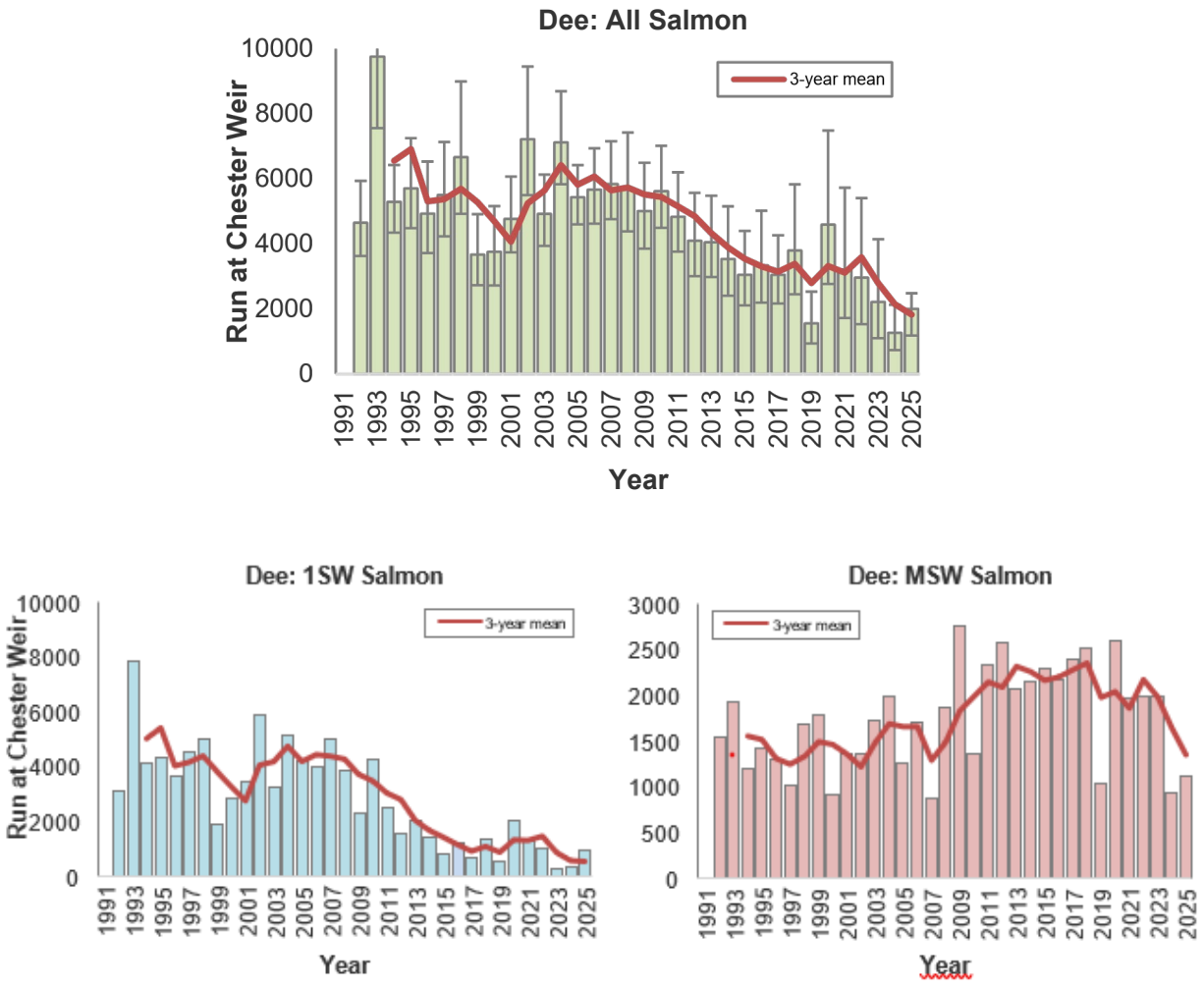
Run size and composition: Provisional results indicate a run of 1,998 salmon (fish of all sea ages) at Chester in 2025. It should be noted, that due to exceptionally low tag returns in 2025, the methodology had to be adapted. This is due to the model not being able to cope with such small tag returns and therefore producing spurious results. This involved using the average over the past 5 years to produce a figure. This is a provisional figure and may change slightly in the future when we have had time to come up with a new methodology to account for dwindling logbook members and thus tag returns. This run represents the third lowest in the ~30-year time-series and among a series of poor returns in recent years – with the first and second lowest returns recorded in 2024 and 2019 at 1,266 and 1,551 fish, respectively (Fig 1). The corresponding trap catch in 2025 was 396 salmon.

Multi-sea winter (MSW) fish continue to dominate the salmon run on the Dee comprising 55% of the total in 2025. In contrast, less than 20 years ago, grilse (or 1SW fish) made up 70-80% of a much larger return.

The Dee is not alone in experiencing a recent marked reduction in the overall abundance of returning salmon linked to a decline in grilse numbers. For example, the same pattern of decline is also evident on most index/counted rivers in E&W. Provisional results for 2025 indicate that salmon counts on most of these rivers were also at or close to the lowest recorded.

Fig. 1 Annual run estimates for salmon at Chester Weir, 1992-2025

(error bars indicate 95% confidence intervals)



Data from the Dee (and elsewhere) indicate that changes in the sea age composition of returning salmon may be part of a cyclical pattern - with the contribution of 1SW salmon in

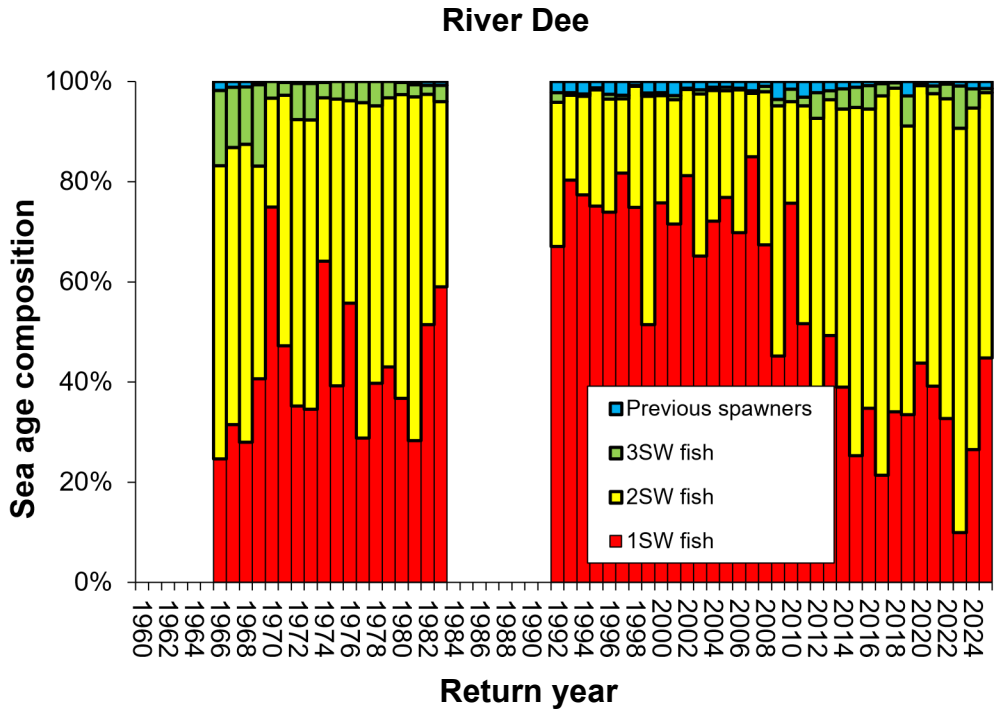
the last few years appearing similar to that 50 years ago when close to 80% of the return was made up of MSW fish (Fig 2).

Long-term cyclical changes in abundance of grilse and multi-sea winter salmon, evident from historic data sets, have been linked to similar cyclical processes affecting environmental conditions in the North Atlantic.

While it is possible we may be experiencing the trough of such a cycle now, and that a reversal of this pattern might be expected at some point in the future, there is no certainty when or if this will happen. Factors such as global warming - not so evident or potentially damaging 50 years ago - may also be at play.

Hence, the precautionary management response is to seek to protect vulnerable stocks and their environment now so they are best placed to respond to the return of more favourable conditions in the future.

Fig. 2 Sea age composition of salmon on the Dee, 1960-2024



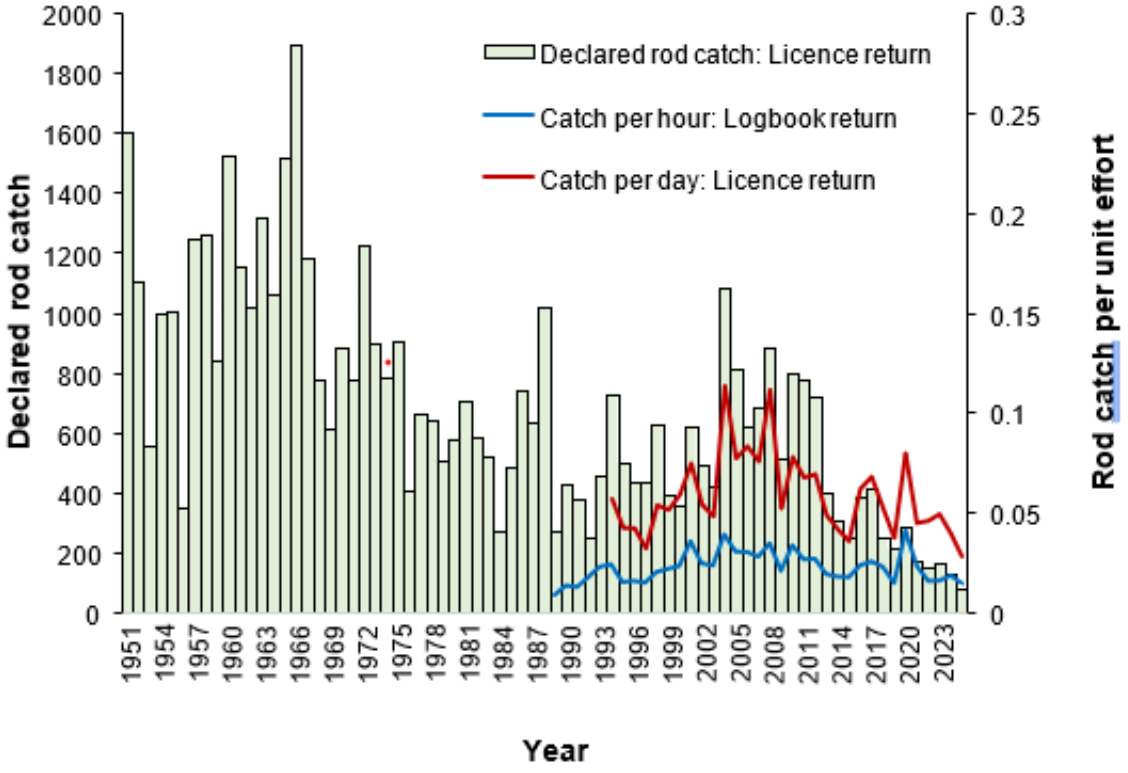
Rod catch: Provisional licence return data indicate a declared rod catch on the Dee of 78 salmon in 2025 - the lowest reported in records going back to 1951 (Fig 3). The second and third lowest salmon rod catches were recorded in 2024 and 2023 at 129 and 148 fish, respectively.

A single national rod licence and catch return-reminder system was introduced in E&W in 1992, but has operated in its current (broadly unchanged) format since 1994. Prior to that, licences were issued regionally and (from the mid-1980s onward) many incorporated catch return-reminder systems similar to the current system.

Uniquely among many jurisdictions, the current rod licencing system in E&W collects fishing effort as well catch data. While this provides a fairly coarse measure of effort – recording 'angler days' fished over the whole season for each river visited, for the Dee at least, the 'catch per day' statistics produced show a similar pattern to the more refined 'catch per hour' data generated by logbook returns. Both these measures of 'catch per unit effort' are also strongly aligned to the rod catch data alone (Fig 3) as well as to estimates of salmon returns at Chester Weir. The fishing effort data generated by the national rod licence system serves as a key variable in modelling angling exploitation rates (i.e. the proportion of the annual run caught by rod fishermen) on the non-counted rivers – a pre-requisite to deriving run estimates from catches for stock assessment purposes.

For the Dee, the angling exploitation rate estimated for salmon in 2025 (i.e. the proportion of the annual run caught by rod fishermen) was 4.3%, a decrease on the rate of 11.2% estimated in 2024 and below the previous 10year average rate of 9.8%.

Fig. 3 Dee salmon rod catch and catch per unit effort, 1951 onward



Spawning escapement: Estimates of the numbers of spawning salmon and the eggs they deposit are based on the run at Chester Weir minus any fishery losses and other sources of mortality. Estimates also take account of the sex ratio of returning fish sampled at

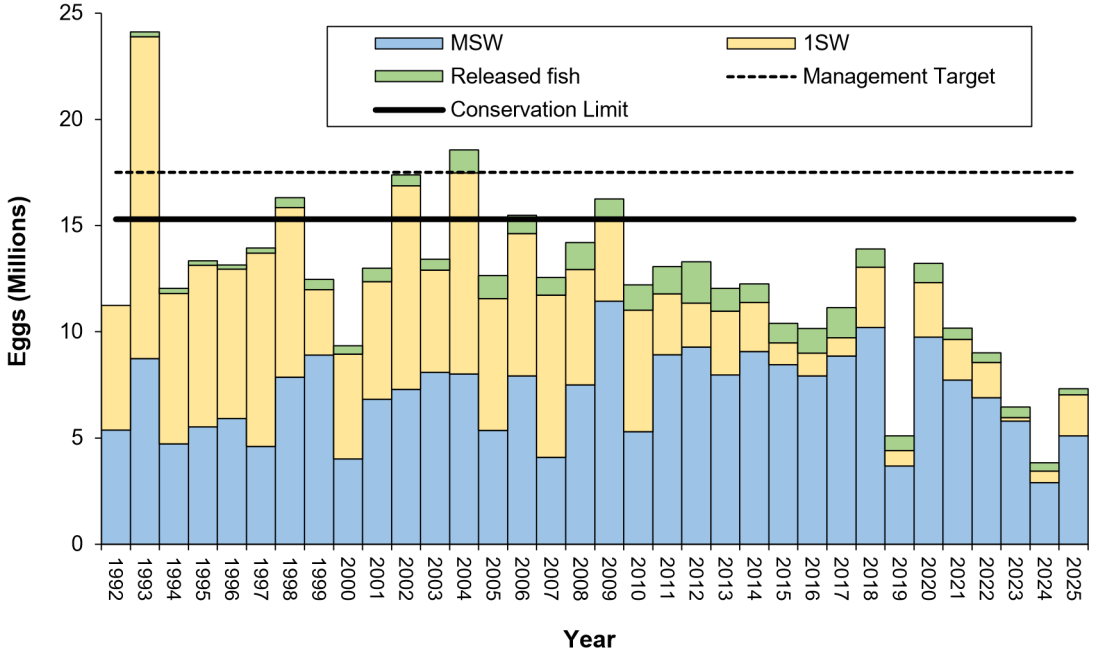
Chester (as judged from external appearance) and their average size (which relates to their likely egg contribution).

The provisional estimate of egg deposition on the Dee in 2025 is 7.32 million eggs - produced by 1,828 spawners. Of these, 69 spawners were estimated to have been rod-released fish contributing 0.28 million eggs. Egg deposition estimates for Dee salmon last met the Conservation Limit (15.3 million eggs) in 2009 (Fig 4).

The 'Management Objective' for all salmon rivers in Wales (and England) is that stocks should meet or exceed their Conservation Limit 80% of the time, or 4 years out of 5, in the long term.

To assess whether this Management Objective is being met, a trend based statistical compliance procedure is applied to egg deposition estimates from the last 10 years. This procedure tests whether a stock is formally passing ('not at risk') or failing ('at risk') its Conservation Limit, or has some intermediate status ('probably not at risk' or 'probably at risk'). On this basis, 'risk' status is usually reported for the current year and (based on an extrapolation of the trend line) 5-years into the future.

Fig. 4 Salmon egg deposition 1992-2025



The Management Target (~17 million eggs) provides an indication of the average number of spawners required (expressed as eggs or adults) to ensure compliance with the Management Objective.

The Management Target is a ‘target’ reference point (i.e. something to ‘aim at’) whereas the Conservation Limit is a ‘limit’ reference point (a lower threshold below which stocks become increasingly vulnerable and which we want to avoid). Statistical compliance procedures ensure there is a high probability (i.e. the 4 years out of 5 rule) that stocks classified as healthy are indeed above their Conservation Limit.

This terminology and the associated assessment procedures - in place in E&W since the early 1990s - are in line with the now long-standing recommendations of ICES (International Council for the Exploration of the Sea) and NASCO (North Atlantic Salmon Conservation Organisation). Conservation Limits are applied in a similar way by other jurisdictions (e.g. in Ireland and Scotland), with similar management consequences for failing stocks.

Results from Conservation Limit compliance assessment in Wales in 2024 indicated that all river stocks of salmon were ‘at risk’ or ‘probably at risk’ – both in the current year and projected 5-years into the future, with most stocks exhibiting a declining trend over the last decade. Most salmon stocks in England were classified as similarly poor. The salmon stock on the Dee was assessed as being ‘at risk’ both in 2024 and projected to 2029.

Provisional results from the latest assessment indicate that stock status remains very poor on most rivers in E&W and unchanged on the Dee (i.e. ‘at risk’ both in 2025 and projected to 2030).

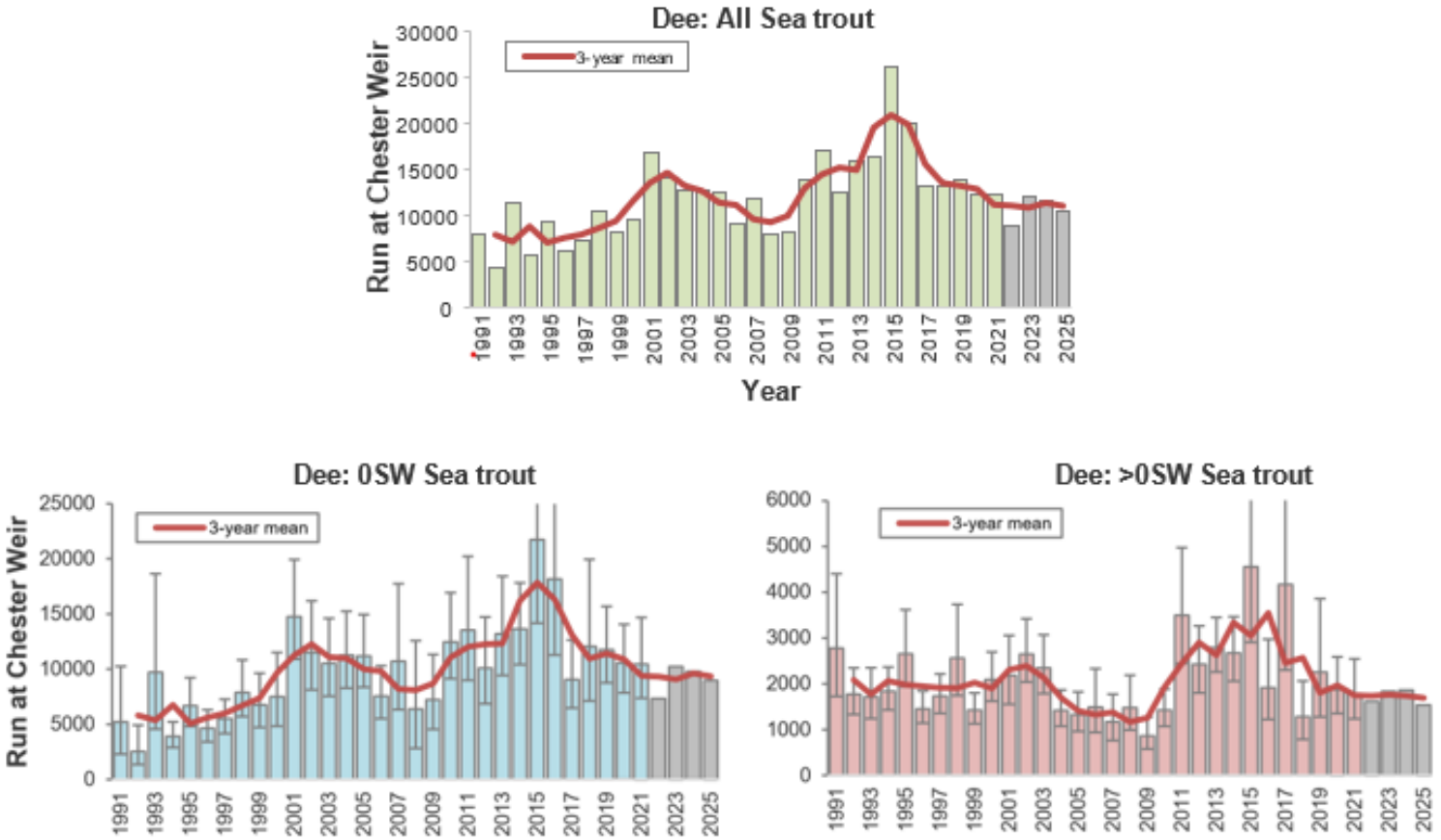
Dee sea trout in 2025

Run size and composition: As described in Section 3, run estimates for sea trout on the Dee are based on recaptures of fish back at Chester trap in the year after tagging - and so are 12 months behind those of salmon.

Separate run estimates are obtained for whitling (0SW) sea trout (i.e. fish which spend only a few months at sea and weigh around 1lb or less on their return) and older (>0SW) fish. In 2021, run estimates for whitling and older sea trout were 10,423 and 1,777 – the former above and the latter below the long-term average returns of ~9,900 and 2,100 fish, respectively (Fig 5).

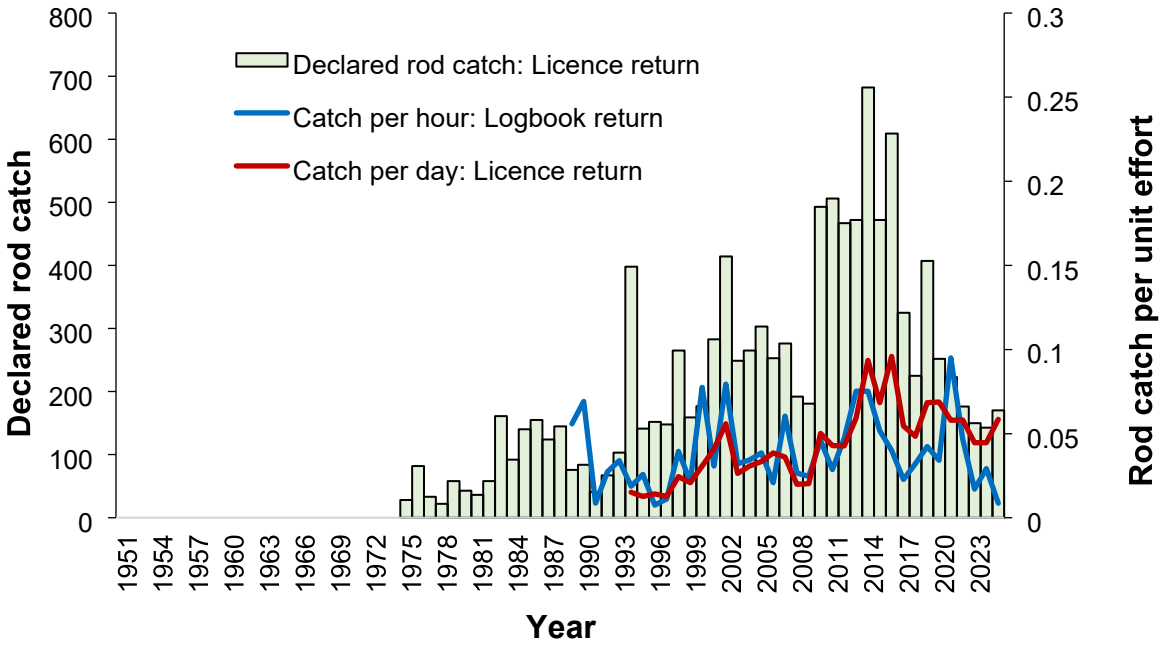
Run estimates for sea trout for the years 2022-2025 remain provisional subject to QA of scale readings (and in the case of 2025, recaptures at Chester trap in 2026). These estimates indicate that the downward trend in the sea trout return - evident since ~2015 - appears to have stabilised at close to ~11,000 fish overall.

Fig. 5 Annual run estimates for sea trout at Chester Weir, 1991-2025 (error bars indicate 95% confidence intervals)



Rod catch: Provisional licence return data indicate a rod catch on the Dee of 170 sea trout in 2025. As with salmon (Fig 3), declared rod catches of sea trout on the Dee are shown from 1951 onwards in Fig 6. The absence of catches pre-1975 reflects the absence records in the early part of the timeseries. Like salmon, measures of catch per unit effort from licence returns (catch per day) and logbook returns (catch per hour) are strongly correlated with each other and with catch and run figures (Fig 6).

Fig. 6 Dee sea trout rod catch and catch per unit effort, 1951 onward

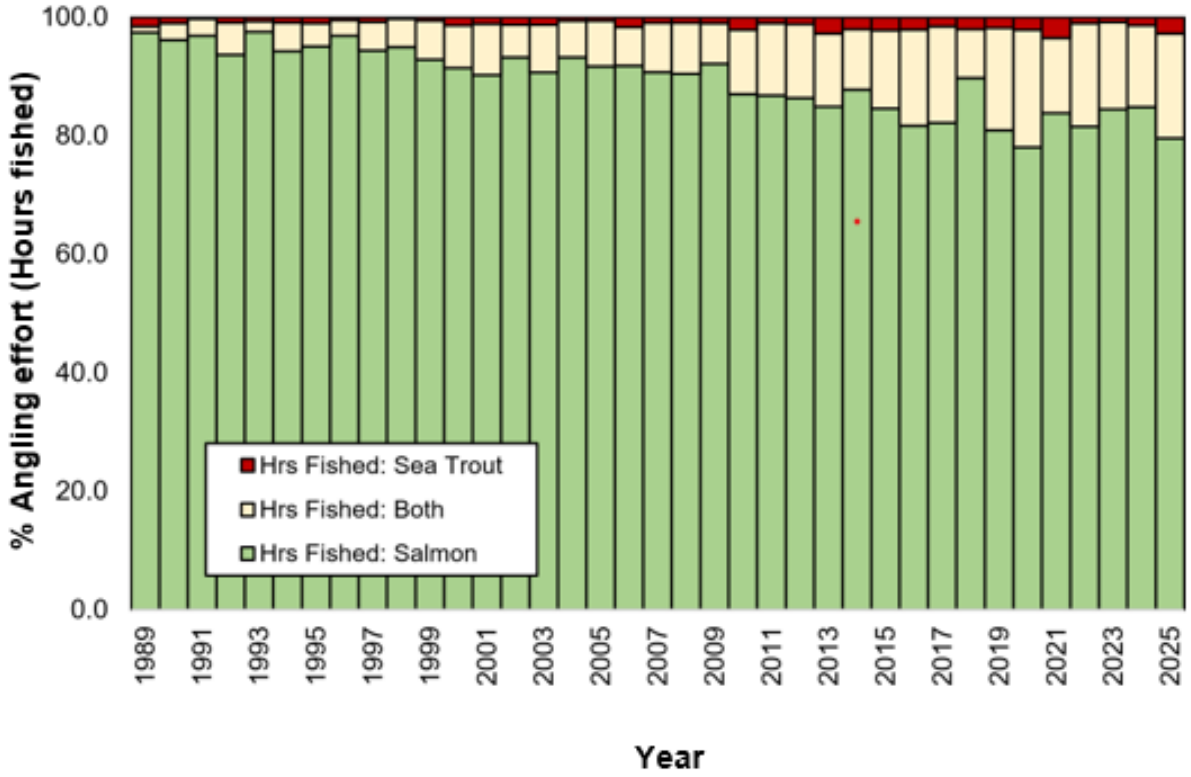


In general terms, the sea trout rod catch on the Dee has been increasing over most of the last ~50 years, averaging less than 100 fish up to the mid-1980s and peaking at 682 fish in 2014. Since then, however, catches have declined sharply. In 2013, the declared catch of sea trout on the Dee (472) exceeded the salmon catch (398) for the first time, and this has been the case in 8 of the 12 years since.

Despite this increase in the sea trout rod catch (in absolute terms and as a proportion of the combined catch of both species), the percentage of total logbook angling effort directed specifically at sea trout has remained low at less than 5%, although the percentage of effort classed as targeting both salmon and sea trout at the same time has grown (Fig 7).

Of the sea trout caught by logbook anglers, most (on average) have been taken by anglers targeting either salmon only (~40%) or both species at the same time (~40%). However, in terms of catch per unit effort, the highest catch rates for sea trout tend to be recorded by those who target sea trout only. For example, recent 10-year average catch rates for sea trout were 11.3, 2.8 and 0.6 fish per 100 hours for those targeting sea trout only, both species, or salmon only, respectively.

Fig. 7 Percentage of fishing effort directed at salmon, sea trout or both species: from Dee Angler Logbook returns, 1989-2025



A new method was introduced in 2017 to evaluate the status of sea trout stocks in Wales, including on the Dee. This derives Conservation Limits for individual river stocks and assesses compliance using approaches similar or identical to those used in salmon; more details are available on our Salmon and sea trout stocks in Wales page.

Using these approaches the Dee sea trout stock was classified as ‘at risk’ both in 2024 and projected to 2029.

Appendices

Further copies of this report are available from enquiries@cyfoethnaturiolcymru.gov.uk.