

## Fish

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Fish differ from other species in this report, as many fish species have a commercial value. The Welsh angling industry is worth around £200million per annum, and it is thought that this could be increased.<sup>1</sup> This figure does not include any added value in terms of health and wellbeing that angling provides.

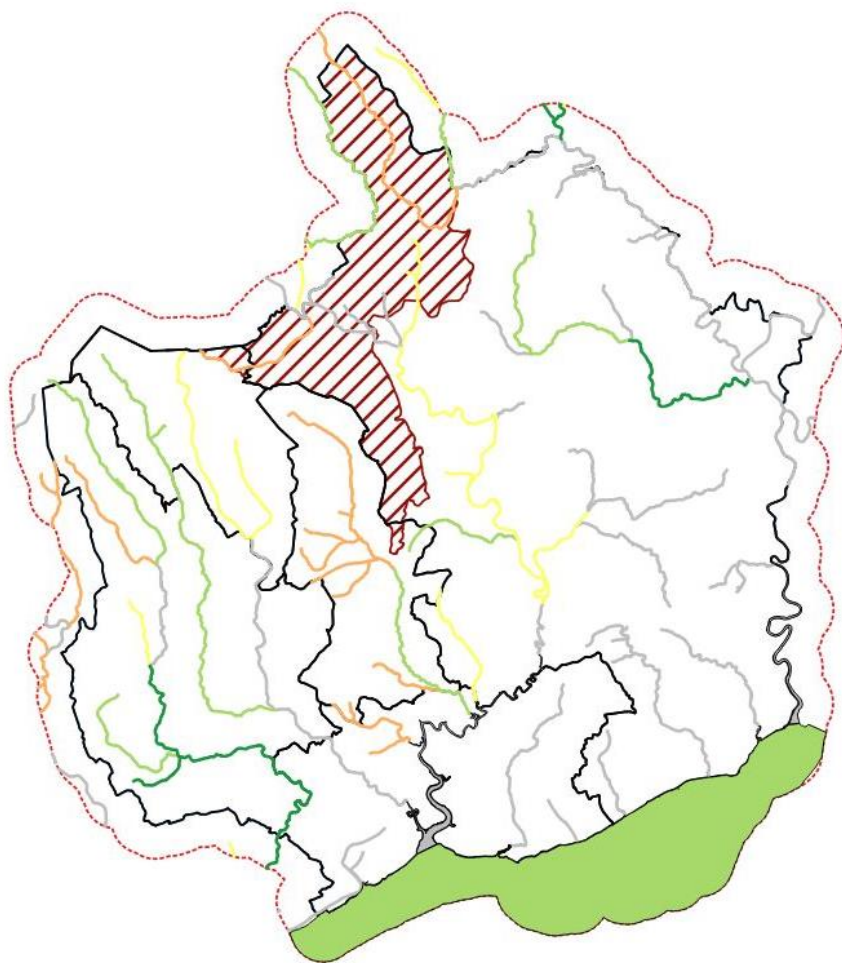
Knowledge of fish populations is limited due to the patchiness of sampling and the translocation and stocking of species for commercial reasons. It is estimated that there are about 28 estuarine and inshore fish species in South Wales, with 14 of these thought to be of regional significance.<sup>2</sup>

Both the River Usk and River Wye are designated as SACs for their fish populations.<sup>3,4</sup> Annex II fish species listed as primary reasons for selection and qualifying features include Sea Lamprey (*Petromyzon marinus*), Brook Lamprey (*Lampetra planeri*), River Lamprey (*L. fluviatilis*), Twaite Shad (*Alosa fallax*), Allis Shad (*A. alosa*), Atlantic Salmon (*Salmo salar*) and Bullhead (*Cottus gobio*). This list includes both anadromous fish (fish that spawn in freshwater but spend part of their lifecycle at sea) and fish that spend their entire lifecycle in freshwater. Many other watercourses, including all the main rivers within the study area, are designated as SINCs, although they may not qualify for their fish populations.

Only 35% of UK rivers are achieving Good Ecological Status under the Water Framework Directive.<sup>5</sup> In Greater Gwent, where fish populations have been assessed, 211km (21 sections) of riverbodies within the study area are classified as only moderate or poor, although it should be noted that there is uncertainty around some of the data.<sup>19</sup> Failing fish populations include Salmon, Bullhead, Brown Trout (*S. trutta*), European Eel (*Anguilla Anguilla*) and Stone Loach (*Barbatula barbatula*). Fish populations are threatened by loss of suitable habitat, pollution, barriers to migration and climate change. There are two river trusts within the study area: The Wye and Usk Foundation and the South East Wales Rivers Trust. Both carry out conservation work relating to habitat improvements, removal of both natural and artificial barriers, and water quality monitoring, as well as raising awareness of the value of river ecosystems.

In this section there are two species, one anadromous – Atlantic Salmon. and one catadromous – European Eel. It should be noted that many of the issues affecting these species are likely to affect other fish species in the area.

*Fish Status of river and transitional waterbodies (Water Framework Directive Cycle 2)<sup>19</sup>*



- High
- Good
- Moderate
- Poor
- No data

## European Eel *Anguilla anguilla* (Linnaeus, 1758)

**Protection:** Eels Regulations (2009)

**Conservation status:** Critically Endangered (Global)<sup>6</sup>

**Data availability:** Moderate (1,079 records)

**Context:** European Eels have a complex life cycle, starting as eggs in the Sargasso Sea. The Gulf Stream carries the larvae, or *leptocephali*, across the Atlantic towards Europe and North Africa. After 1–3 years, when they reach shallower waters, the larvae metamorphose into glass eels, which colonise coastal waters and estuaries. Most glass eels will migrate inland, usually at night, using tidal flows and actively swimming upstream to freshwater, although some remain in the estuaries and around the coast. Over the next 10–15 years, glass eels mature into elvers and eventually become adult, yellow eels. Finally, yellow eels metamorphose into silver eels, which migrate back to the Sargasso Sea to spawn. The exact location of the spawning grounds is unknown, and spawning behaviour has never been observed.



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The European Eel population has shown a marked decline: glass eel recruitment in the North Sea in 2020 was 0.5% compared to that in 1960–1979.<sup>7</sup> For yellow eels, recruitment in 2019 was 17% compared to 1960–1979.<sup>7</sup> More locally, yellow eels in the Severn Estuary have declined by 15% every year since 1980 – abundance in 2009 was estimated at 1% of the 1980 levels<sup>8</sup> – one of the greatest population crashes of a fish population ever reported.

Both glass eels and yellow eels are fished commercially. The collapse of eel stocks led to an EU regulation and, subsequently, to the UK Eel Regulations, which require that eel management plans at catchment level are produced and restrict the catches of both glass eels and yellow eels, as well as making provision for eel passes at dams, weirs and similar structures.

This section includes Natural Resources Wales fish sampling data in addition to records from SEWBRc, HBRC, GERC and NBN. Records are for glass eels, elvers and adult eels (presumed to include both yellow and silver eels).

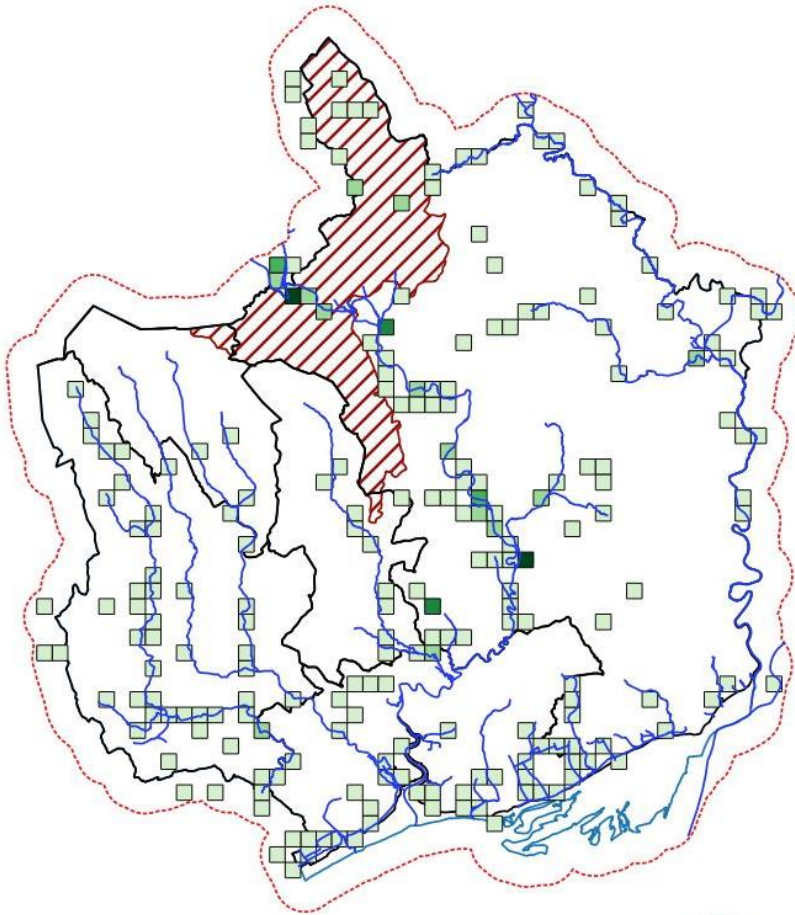
**Outlook:** Currently the Severn eel population is failing to meet its escapement targets.<sup>9,10</sup> However, there are difficulties around the target, which must be based on a theoretical output of a ‘pristine’ catchment. There is an extensive glass eel fishery throughout the Severn – most activity is on the Severn in England, although fishing was also carried out until this year on the Wye, and to a lesser extent, the Usk<sup>9</sup>. NRW took the decision to close the eel and glass eel fisheries in Wales in 2021 due to ongoing concerns about the overall status of the eel stock as well as uncertainties around the health of local populations.

The Severn Eel Management Plan identifies loss of habitat, through barriers to migration, as a ‘major pressure’ on European Eel populations. Over 400 barriers to migration were identified within the Severn catchment, with 62 on the Usk and Wye.<sup>9</sup> The tidal flaps that control drainage on the Gwent Levels are also identified as ‘poorly accessible’,<sup>9</sup> meaning that relatively few eels are able to reach the reens, which offer good eel habitat. Work is ongoing to remove or modify these barriers, as well as

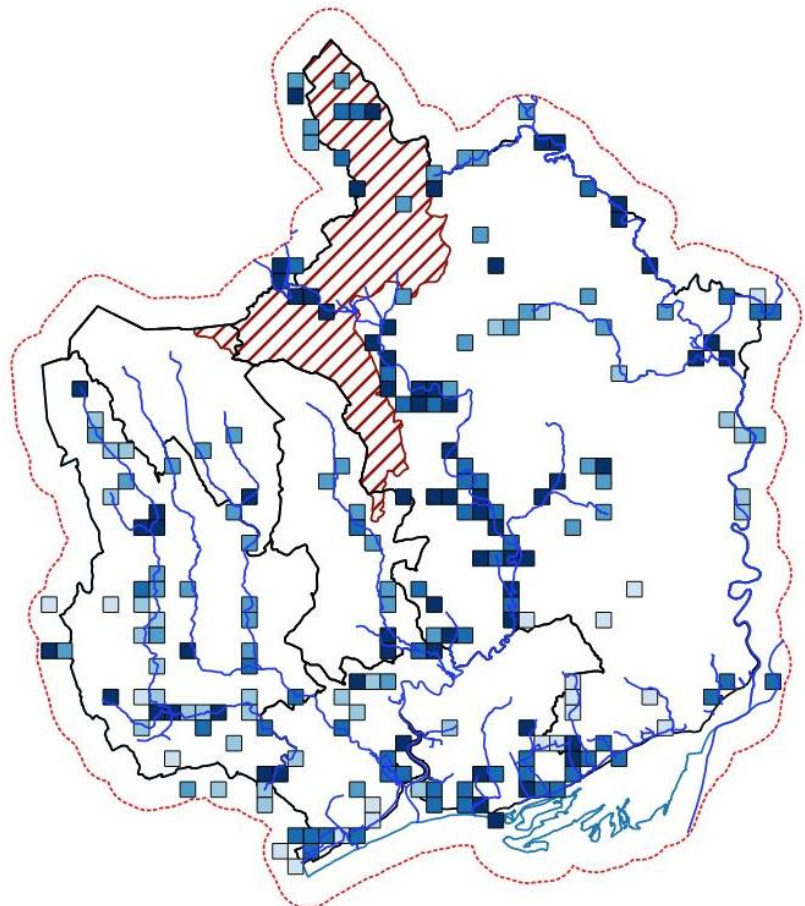
improving data collection and monitoring of fisheries.<sup>9</sup> Awareness-raising work is also taking place, with the South East Wales Rivers Trust (SEWRT) running an Eels in the Classroom project.<sup>11</sup>

**Greater Gwent range:** Records for European Eel are found across Greater Gwent and on all of the main rivers. Hotspots are related to sampling and recording effort, especially as Natural Resources Wales sampling is often repeated at the same locations. However, most records, especially from the eastern valleys (Rhymney, Sirhowy and Ebbw) are older, from before 2000. Most of the more recent records are concentrated on the Usk and the Gwent Levels. This pattern corresponds to the distribution shown by the Severn Eel Management Plan.<sup>9</sup> There is a surprising lack of records along the Wye; it is possible that the English Environment Agency holds additional records. Equally, there are few records from the Severn Estuary, probably due to the difficulties of sampling; most information from the Severn comes from dedicated studies or the monitoring of the cooling-water intake screens at Hinkley Point.<sup>8</sup>

*Density of European Eel records, maximum 55 records/km<sup>2</sup> (main rivers<sup>12</sup> shown for clarity)*

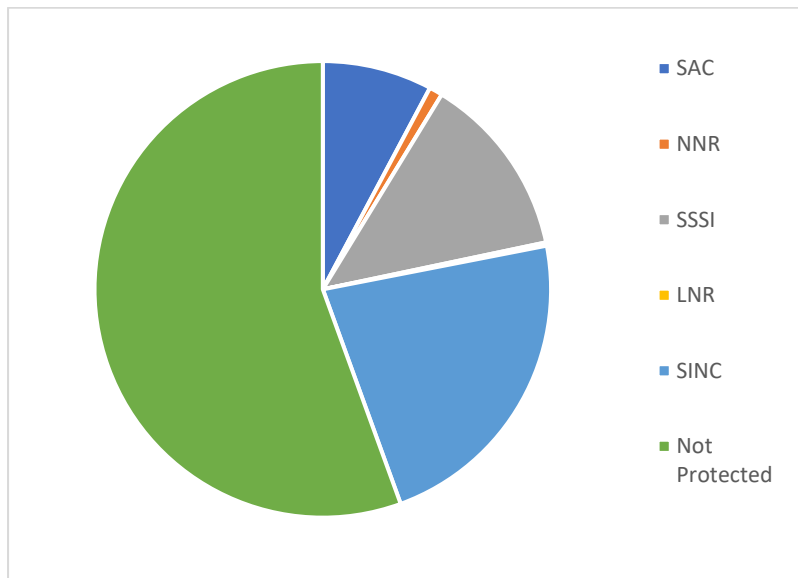


*European Eel records by decade (main rivers<sup>12</sup> shown for clarity)*



**Protection:** Just under half (46%) of records come from protected sites, with high numbers of records from the Wye and Usk SACs, Gwent Levels SSSIs and river SINCs. It is likely that more records are from protected sites and are falling outside of the narrow site boundaries due to centring of grid references. Most main rivers within Greater Gwent have some degree of protection.

*European Eel records from protected sites*





## Atlantic Salmon *Salmo salar* (Linnaeus, 1758)

**Protection:** Habitats Regulations (2017) Schedule 4, Salmon Act (1986), various byelaws

**Conservation status:** UKBAP Priority Species, Wales S7 Species

**Data availability:** Moderate (611 records)

**Context:** Atlantic Salmon are an iconic fish species, known for their spectacular leaps as they migrate from the ocean to their freshwater spawning grounds.

Salmon are faithful to the river where they hatched and will migrate thousands of kilometres to breed. Young salmon (known as fry, then parr after the first year) hatch in spring and can remain in freshwater for up to seven years. These will change into smolts, which are able to survive in saltwater, before migrating downstream. They spend a year or more at sea, before returning to the river to breed.<sup>13</sup>

Atlantic Salmon are an important species culturally and economically, but numbers of salmon have fallen dramatically since the 1980s, reducing by more than half over a period of 33 years.<sup>13</sup> This was despite a reduction in salmon exploitation that followed the creation of a large protected zone free from targeted fisheries in the North Atlantic Ocean in 1983. The North Atlantic Salmon Conservation Organization (NASCO) was formed at the same time.

Threats to Atlantic Salmon populations include habitat degradation, pollution, barriers to migration, and diseases (often from farmed salmon). Climate change is also a concern. Salmon are sensitive to changes in water temperatures, and changes also affect their prey sources and timings of migration. Locally, both the Wye and Usk are designated as SACs for their Atlantic Salmon populations. Both have high quality habitat for spawning, with the Wye noted as the most productive salmon river in Wales, historically.<sup>3,4</sup>

**Outlook:** Currently, the UK and Welsh populations are still declining.<sup>14,15</sup> There are additional concerns that the population has an abnormal age structure.<sup>14</sup> In Wales, the population is declining at each stage in its lifecycle, from low egg deposition rates and falling numbers of juveniles, to declines in returning adults.<sup>15</sup> Numbers of Salmon in the Usk and Wye vary considerably from year to year, but both are at very low levels following a population crash in 2018 (see below). Estimated egg deposition is currently below the conservation limit for both rivers, with stocks predicted to be 'probably at risk' in five years time. The population is predicted to continue to decline, although there is some uncertainty.<sup>16,17</sup>

Natural Resources Wales has produced a national action plan for Atlantic Salmon and Sea Trout (*Salmo trutta*)<sup>1</sup> which focuses on improving the evidence base, managing exploitation and improving water quality and salmon habitat. Local partners include the Wye Salmon Association and the Wye and Usk Foundation. Significant progress has been made in restoring habitat and removing migration barriers: the Wye and Usk Foundation estimate that they have restored access to over 800km of the Wye and Usk and their tributaries (some of this will be outside of the study area).<sup>18</sup>

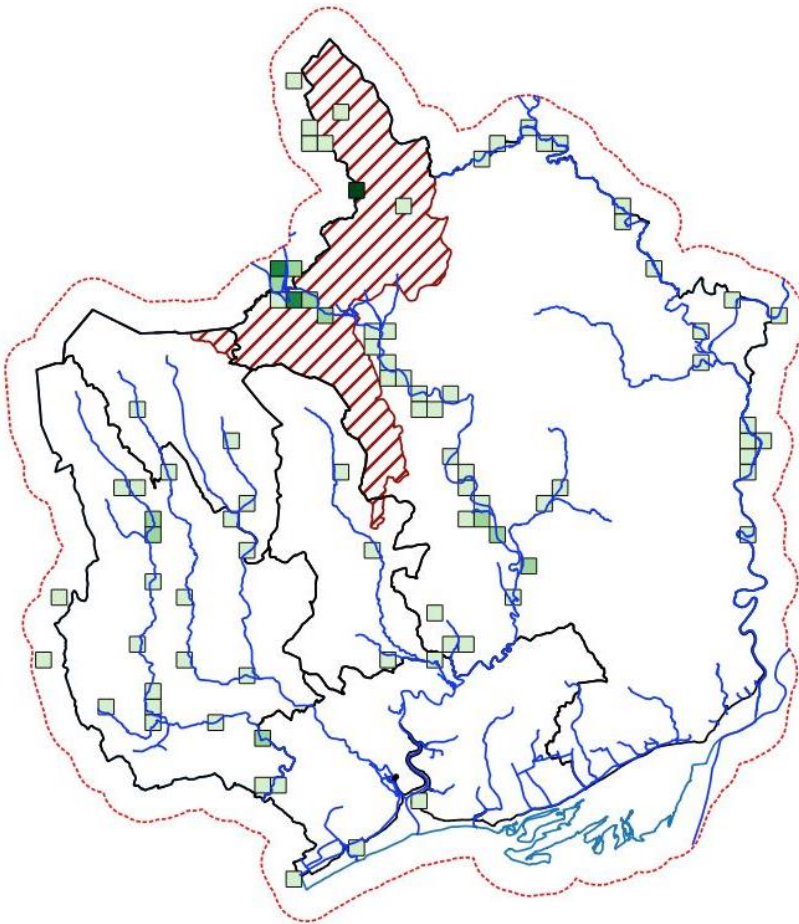


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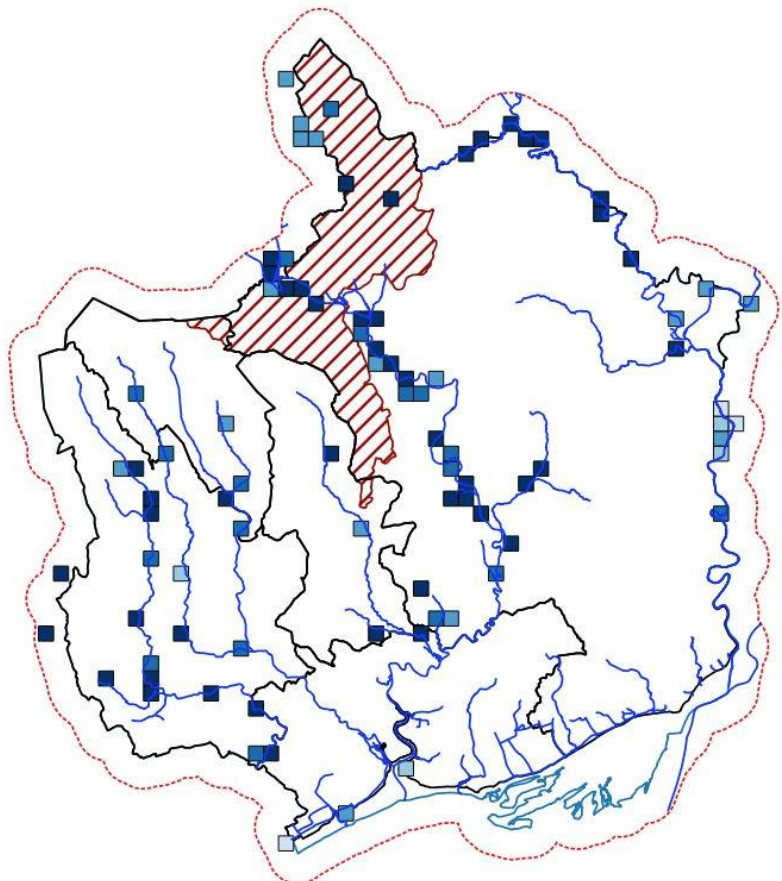
**Greater Gwent range:** Most Greater Gwent records are concentrated along the River Usk, with a recording hotspot on the Grwyne Fawr, a tributary of the Usk. There are also recent records along the Monnow. There are fewer, older records within the Valleys, and surprisingly few records along the Wye. It is possible that there are additional Wye records held by English organisations.



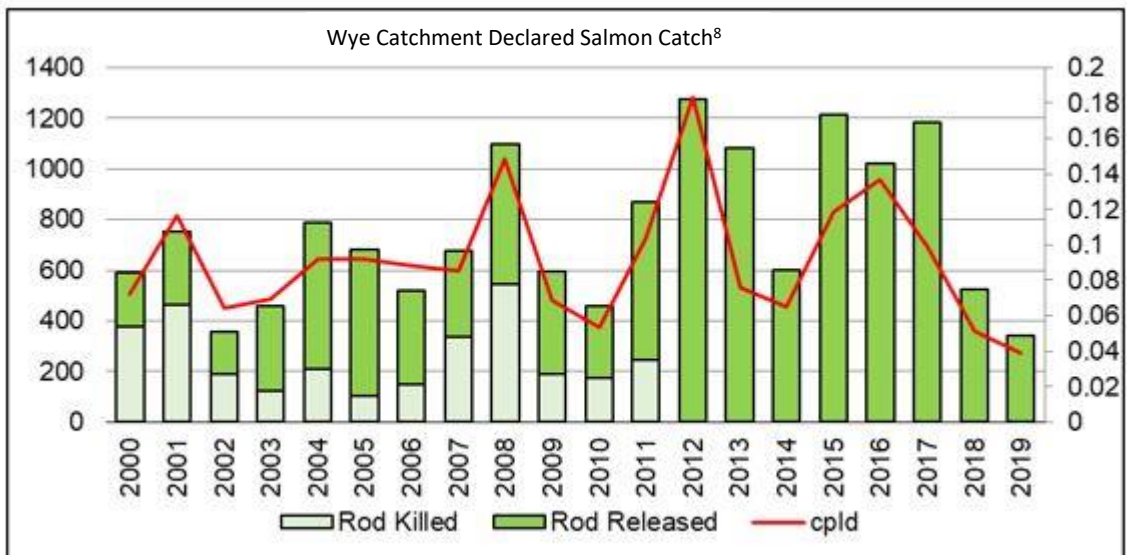
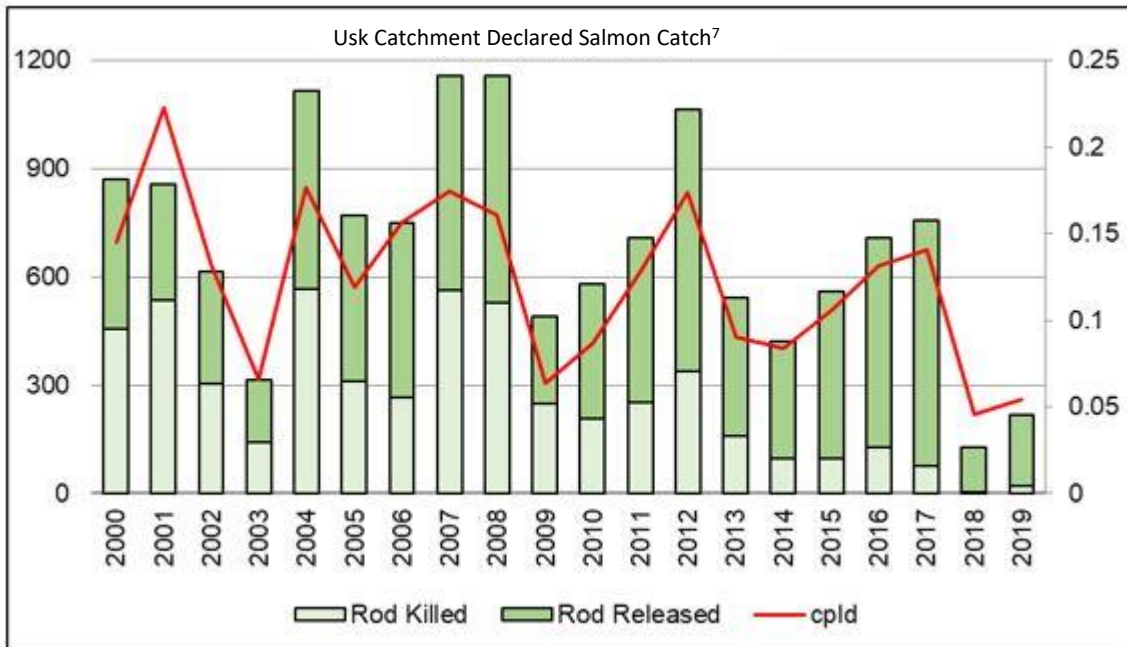
Density of Atlantic Salmon records, maximum 55 records/km<sup>2</sup> (main rivers<sup>12</sup> included for clarity)



Atlantic Salmon records by decade (main rivers<sup>12</sup> shown for clarity)

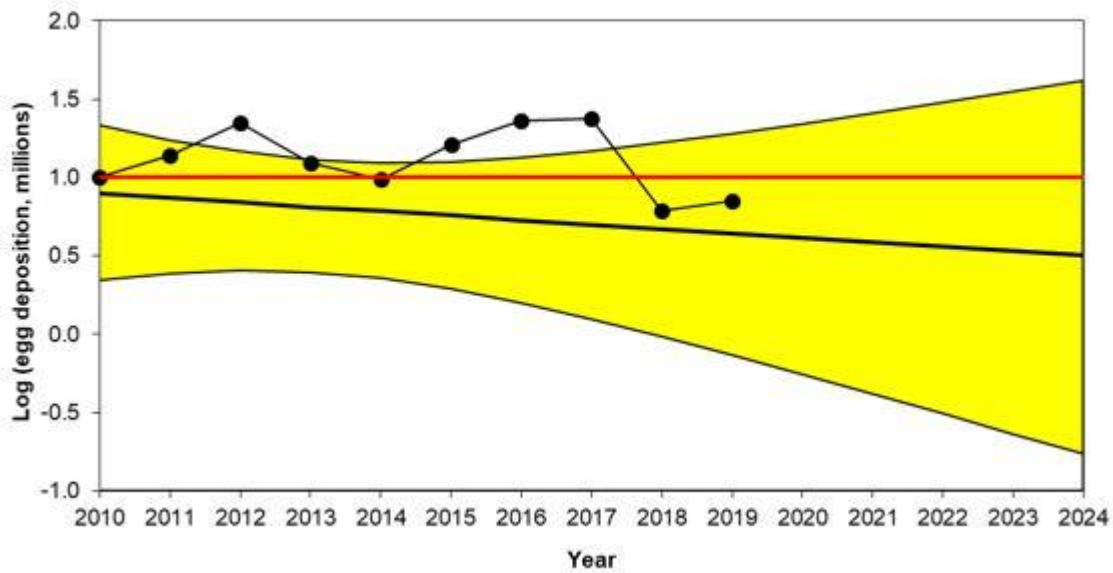


**Population trends:** Declared catches and the Catch Per Licence Day (CPLD) are available for the Usk and Wye catchments. Both show a large variation between years and a population crash in 2018.<sup>16,17</sup> A byelaw to release all rod-caught salmon was introduced on the Wye in 2012, and this now applies to all rivers in Wales.

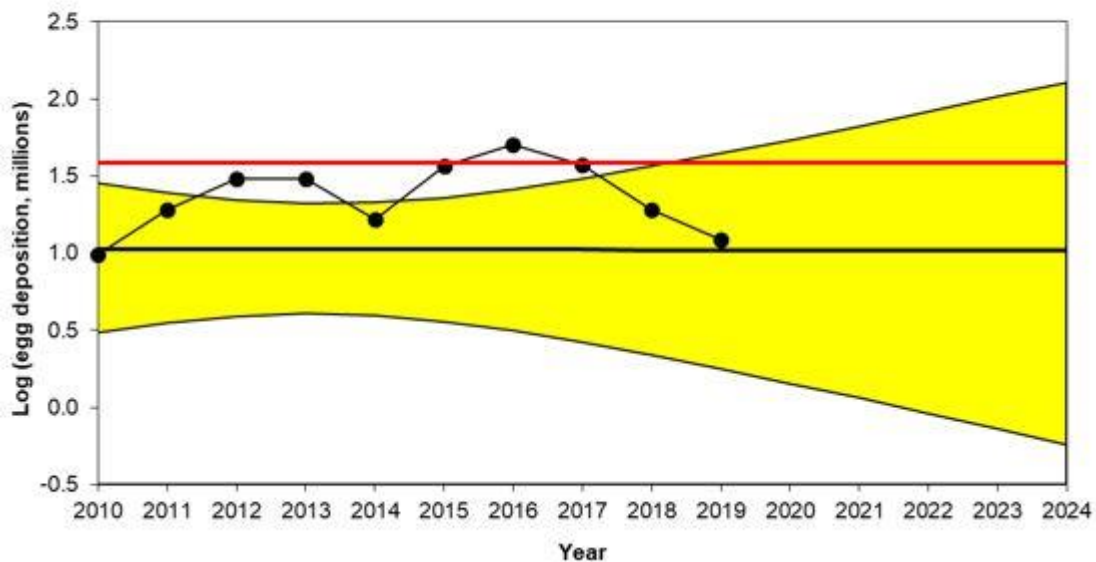


Estimates of egg deposition are also available for the Usk and Wye catchments. These also show the conservation limit, which aims to protect an optimum level of stock, i.e. the number of eggs needed each year in order to conserve salmon stocks for the future. Egg deposition estimates for both rivers are currently below their conservation limits.

River Usk estimates of egg deposition and compliance with conservation limit<sup>17</sup>

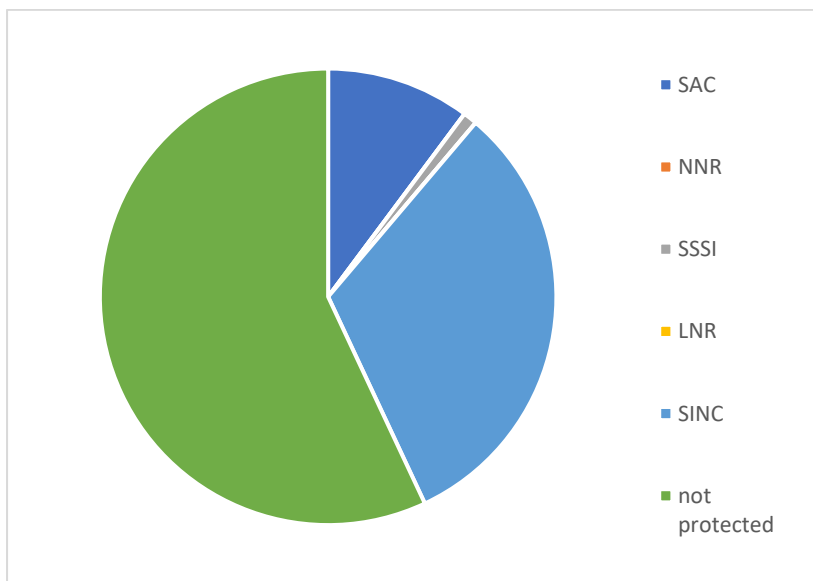


River Wye estimates of egg deposition and compliance with conservation limit<sup>17</sup>



**Protection:** Just under half (43%) of records come from protected sites, with high numbers of records from the Usk and Wye SACs and the rivers designated as SINC, such as the Monnow, Trothy, Ebbw, Sirhowy, and Rhymney. The Afon Lwyd is also a SINC with some records, but the designation is currently expressed as a line, rather than a polygon, so records are not picked up in a search. It is likely that most records are within watercourses with some degree of protection, as most main watercourses are designated as SINC or SSSI/SAC. Some records will fall outside of the designated area due to centring of records and the narrow shape of the designated site.

*Atlantic Salmon records from protected sites*



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