Report under The Conservation of Habitats and Species Regulations 2017 (as amended), Regulation 9A

2019-2024

Conservation status assessment for the species:

S1106 - Atlantic salmon

(*Salmo salar*)

Wales

Cyfoeth Naturiol Cymru
Natural Resources Wales

JNCC

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Important note - Please read

- The information in this document represents the Wales Report under The Conservation of Habitats and Species Regulations 2017 (as amended), Regulation 9A, for the period 2019-2024.
- It is based on supporting information provided by Natural Resources Wales, which is documented separately.
- The Habitats Regulations reporting 2019-2024 Approach Document provides details on how this supporting information contributed to the UK Report and the fields that were completed for each parameter.
- Maps showing the distribution and range of the species are included.
- Explanatory notes (where provided) are included at the end. These provide additional audit trail information to that included within the assessments. Further underpinning explanatory notes are available in the related country reports.
- Some of the reporting fields have been left blank because either: (i) there was insufficient information to complete the field; (ii) completion of the field was not obligatory; and/or (iii) the field was not relevant to this species (section 12 National Site Network coverage for Annex II species).

Further details on the approach to the Habitats Regulations Reporting 2019-2024 are available on the JNCC website.

Assessment Summary: Atlantic salmon

Distribution Map

Range Map

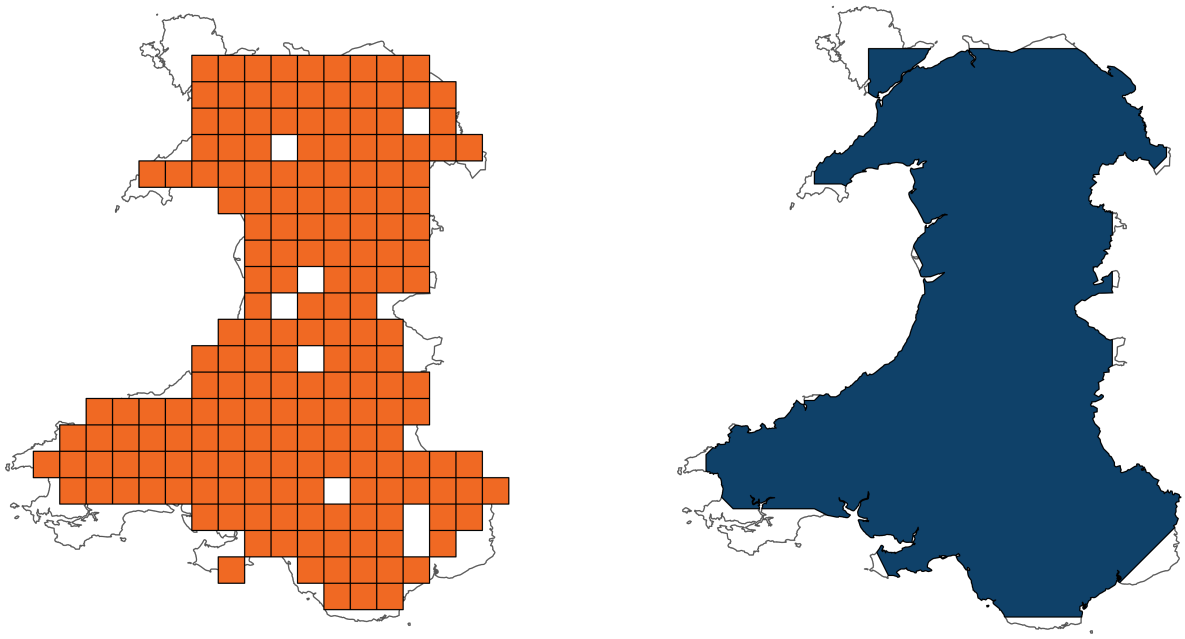

Figure 1: Wales distribution and range map for S1106 - Atlantic salmon (*Salmo salar*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority. The 10km grid square distribution map is based on available species records within the current reporting period.

Table 1: Table summarising the conservation status for S1106 - Atlantic salmon (*Salmo salar*). Overall conservation status for species is based on assessments of range, population, habitat for the species, and future prospects.

Overall Conservation Status (see section 11)

Unfavourable-bad (U2)

Breakdown of Overall Conservation Status

Range (see section 5)	**Unfavourable-inadequate (U1)**
Population (see section 6)	**Unfavourable-bad (U2)**
Habitat for the species (see section 7)	**Unfavourable-bad (U2)**
Future prospects (see section 10)	**Unfavourable-bad (U2)**

List of Sections

National Level

1. General information

1.1 Country	Wales
1.2 Species code	S1106
1.3 Species scientific name	*Salmo salar*
1.4 Alternative species scientific name	
1.5 Common name	Atlantic salmon
Annex(es)	II, V

2. Maps

2.1 Sensitive species	No
2.2 Year or period	2019-2024
2.3 Distribution map	Yes
2.4 Distribution map; Method used	Complete survey or a statistically robust estimate

2.5 Additional information

No additional information

3. Information related to Annex V Species

3.1 Is the species taken in the wild / exploited?	Yes

3.2 What measures have been taken?

a) Regulations regarding access to property	No
b) Temporary or local prohibition on the taking of specimens in the wild and exploitation	Yes
c) Regulation of the periods and/or methods of taking specimens	Yes
d) Application of hunting and fishing rules which take account of the conservation of such populations	Yes

e) Establishment of a system of licences for taking specimens or of quotas	Yes
f) Regulation of the purchase, sale, offering for sale, keeping for sale, or transport for sale of specimens	Yes
g) Breeding in captivity of animal species as well as artificial propagation of plant species	No
Other measures	No
Other measures description	

3.3: Hunting bag or quantity taken in the wild for Mammals and Acipenseridae (Fish)

a) Unit No unit - not reported

Table 2: Quantity taken from the wild during the reporting period (see 3.3a for units). For species with defined hunting seasons, Season 1 refers to 2018/2019 (autumn 2018 to spring 2019), and Season 6 to 2023/2024. For species without hunting seasons, data are reported by calendar year: Year 1 is 2019, and Year 6 is 2024.

	Season/ year 1	Season/ year 2	Season/ year 3	Season/ year 4	Season/ year 5	Season/ year 6
b) Minimum	-	-	-	-	-	-
c) Maximum	-	-	-	-	-	-
d) Unknown	No	No	No	No	No	No

3.4: Hunting bag or quantity taken in the wild; Method used

3.5: Additional information

No additional information

Biogeographical Level

4. Biogeographical and marine regions

4.1 Biogeographical or marine region where the species occurs ATL

4.2 Sources of information

See section 14 References

5. Range

5.1 Surface area (km²)	19,314.03
5.2 Short-term trend; Period	2013-2024
5.3 Short-term trend; Direction	Stable
5.4 Short-term trend; Magnitude	
a) Estimated minimum	
b) Estimated maximum	
c) Pre-defined range	
d) Unknown	No
e) Type of estimate	
f) Rate of decrease	
5.5 Short-term trend; Method used	Complete survey or a statistically robust estimate
5.6 Long-term trend; Period	1990-2024
5.7 Long-term trend; Direction	Stable
5.8 Long-term trend; Magnitude	
a) Minimum	
b) Maximum	
c) Rate of decrease	

5.9 Long-term trend; Method used	Complete survey or a statistically robust estimate

5.10 Favourable Reference Range (FRR)

a) Area (km²)	
b) Pre-defined increment	Current range is between 2% and 10% smaller than the FRR
c) Unknown	No
d) Method used	Reference-based approach
e) Quality of information	high

5.11 Change and reason for change in surface area of range

a) Change	No
b) Genuine change	
c) Improved knowledge or more accurate data	
d) Different method	
e) No information	
f) Other reason	
g) Main reason	

5.12 Additional information

No additional information

6. Population

6.1 Year or period	2019-2023

6.2 Population size (in reporting unit)

a) Unit	number of adults
b) Minimum	
c) Maximum	

d) Best single value	12,900
6.3 Type of estimate	Multi-year mean
6.4 Quality of extrapolation to reporting unit	
6.5 Additional population size (using population unit other than reporting unit)	
a) Unit	
b) Minimum	
c) Maximum	
d) Best single value	
e) Type of estimate	
6.6 Population size; Method used	Complete survey or a statistically robust estimate
6.7 Short-term trend; Period	2009-2023
6.8 Short-term trend; Direction	Decreasing
6.9 Short-term trend; Magnitude	
a) Estimated minimum	
b) Estimated maximum	
c) Pre-defined range	Decreasing 51 - 100%
d) Unknown	No
e) Type of estimate	Best estimate
f) Rate of decrease	Decreasing >1% (more than one percent) per year on average
6.10 Short-term trend; Method used	Complete survey or a statistically robust estimate
6.11 Long-term trend; Period	1956-2023
6.12 Long-term trend; Direction	Decreasing

6.13 Long-term trend; Magnitude	
a) Minimum	86
b) Maximum	86
c) Confidence interval	
d) Rate of decrease	Decreasing >1% (more than one percent) per year on average
6.14 Long-term trend; Method used	Complete survey or a statistically robust estimate

6.15 Favourable Reference Population (FRP)

ai) Population size	
aii) Unit	
b) Pre-defined increment	Current population is between 51% and 100% smaller than the FRP
c) Unknown	No
d) Method used	Reference-based approach
e) Quality of information	high

6.16 Change and reason for change in population size

a) Change	Yes
b) Genuine change	Yes
c) Improved knowledge or more accurate data	No
d) Different method	No
e) No information	No
f) Other reason	No
g) Main reason	Genuine change

6.17 Additional information

No additional information

6.18 Age structure, mortality and reproduction deviation	Yes, strongly deviating from normal

7. Habitat for the species

7.1 Sufficiency of area and quality of occupied habitat (for long-term survival)

a) Is area of occupied habitat sufficient?	No
b) Is quality of occupied habitat sufficient?	No
c) If No or Unknown, is there a sufficiently large area of unoccupied habitat of suitable quality?	No

7.2 Sufficiency of area and quality of occupied habitat; Method used

a) Sufficiency of area of occupied habitat; Method used	Complete survey or a statistically robust estimate
b) Sufficiency of quality of occupied habitat; Method used	Complete survey or a statistically robust estimate

7.3 Short-term trend; Period	2015-2024
7.4 Short-term trend; Direction	Stable
7.5 Short-term trend; Method used	Complete survey or a statistically robust estimate
7.6 Long-term trend; Period	
7.7 Long-term trend; Direction	
7.8 Long-term trend; Method used	

7.9 Additional information

No additional information

8. Main pressures

8.1 Characterisation of pressures

Table 3: Pressures affecting the species, including timing and importance/impact ranking. Pressures are defined as factors acting currently and/or during the reporting period (2019–2024). Rankings are: High (direct/immediate influence and/or large spatial extent) and Medium (moderate direct/immediate influence, mainly indirect and/or regional extent).

Pressure	Timing	Ranking
PA14: Use of plant protection chemicals in agriculture	Ongoing and likely to be in the future	Medium (M)
PA23: Physical alteration of water bodies (including dams, channels, etc.)	Ongoing and likely to be in the future	High (H)
PB24: Drainage for forestry	Ongoing and likely to be in the future	Medium (M)
PA17: Agricultural activities generating pollution to surface or ground waters (including marine)	Ongoing and likely to be in the future	High (H)
PG01: Marine fish and shellfish harvesting causing reduction of species/prey populations and disturbance of species (professional)	Ongoing and likely to be in the future	Medium (M)
PG13: Bycatch and incidental killing (due to fishing and hunting activities)	Ongoing and likely to be in the future	Medium (M)
PD01: Wind, wave and tidal power (including infrastructure)	Ongoing and likely to be in the future	Medium (M)
PI01: Invasive alien species of Union concern	Ongoing and likely to be in the future	Medium (M)
PK01: Mixed source pollution to surface and ground waters (limnic and terrestrial)	Ongoing and likely to be in the future	Medium (M)
PK05: Mixed source soil pollution and solid waste (excluding discharges)	Ongoing and likely to be in the future	Medium (M)
PD02: Hydropower (dams, weirs, run-off-the-river and respective infrastructure)	Ongoing and likely to be in the future	Medium (M)
PJ01: Temperature changes and extremes due to climate change	Ongoing and likely to be in the future	High (H)
PJ10: Change of habitat location, size, and / or quality due to climate change	Ongoing and likely to be in the future	High (H)

PX02: Threats and pressures from outside the Member State	Ongoing and likely to be in the future	High (H)
PJ11: Desynchronisation of biological / ecological processes due to climate change	Ongoing and likely to be in the future	High (H)

8.2 Sources of information

See section 14 References

8.3 Additional information

No additional information

9. Conservation measures

9.1: Status of measures

a) Are measures needed?	Yes
b) Indicate the status of measures	Measures identified and taken
9.2 Main purpose of the measures taken	Restore the habitat of the species (related to 'Habitat for the species')
9.3 Location of the measures taken	Both inside and outside National Site Network
9.4 Response to measures	Medium-term results (within the next two reporting periods, 2025–2036)

9.5 List of main conservation measures

Table 4: Key conservation measures addressing current pressures and/or anticipated threats during the next two reporting periods (2025–2036). Measures are ranked by importance/impact: High (direct/ immediate influence and/or large spatial extent) and Medium (moderate direct/immediate influence, mainly indirect and/or regional extent).

Conservation measure	Ranking
MA10: Reduce/eliminate point or diffuse source pollution to surface or ground waters (including marine) from agricultural activities	High (H)
MC04: Reduce impact of hydropower operation and infrastructure (incl. the restoration of freshwater habitats)	Medium (M)

MC13: Other measures related to extraction and energy exploitation activities	Medium (M)
MF02: Habitat restoration of areas impacted by residential, commercial, industrial and recreational infrastructure, operations and activities	High (H)
MF04: Reduce/eliminate pollution to surface or ground waters from commercial, residential and recreational areas and activities, and from industrial activities and structures	High (H)
MG02: Management of hunting, recreational fishing, and the recreational or commercial harvesting or collection of plants and fungi (incl. restoration of habitats)	High (H)
MG05: Reduce bycatch and incidental killing of non-target species	Medium (M)
MJ02: Implement climate change adaptation measures	High (H)
MK02: Reduce impact of multi-purpose hydrological changes	High (H)

9.6 Additional information

No additional information

10. Future prospects

10.1a Future trends of parameters

ai) Range	Very Negative - decreasing >1% (more than one percent) per year on average
bi) Population	Very Negative - decreasing >1% (more than one percent) per year on average
ci) Habitat for the species	Negative - slight/moderate deterioration

10.1b Future prospects of parameters

aii) Range	Bad
bii) Population	Bad
cii) Habitat for the species	Bad

10.2 Additional information

No additional information

11. Conclusions

11.1 Range	Unfavourable-inadequate (U1)
11.2 Population	Unfavourable-bad (U2)
11.3 Habitat for the species	Unfavourable-bad (U2)
11.4 Future prospects	Unfavourable-bad (U2)
11.5 Overall assessment of Conservation Status	Unfavourable-bad (U2)
11.6 Overall trend in Conservation Status	Deteriorating

11.7 Change and reason for change in conservation status

This field is not reported as the period 2019-2024 marks the first instance in which conservation status has been assessed at the national level, meaning no comparisons to previous reports can be drawn.

11.7 Change and reason for change in conservation status trend

This field is not reported as the period 2019-2024 marks the first instance in which conservation status has been assessed at the national level, meaning no comparisons to previous reports can be drawn.

11.8 Additional information

No additional information

12. UK National Site Network (pSCIs, SCIs, SACs) coverage for Annex II species

12.1 Population size inside the pSCIs, SCIs and SACs network

a) Unit	number of adults
b) Minimum	
c) Maximum	

d) Best single value	11,070
12.2 Type of estimate	Multi-year mean
12.3 Population size inside the network; Method used	Complete survey or a statistically robust estimate
12.4 Short-term trend of population size within the network; Direction	Decreasing
12.5 Short-term trend of population size within the network; Method used	Complete survey or a statistically robust estimate
12.6 Short-term trend of habitat for the species inside the pSCIs, SCIs and SACs network; Direction	Stable
12.7 Short-term trend of habitat for the species inside the pSCIs, SCIs and SACs network; Method used	Based mainly on extrapolation from a limited amount of data

12.8 Additional information

No additional information

13. Complementary information

13.1 Justification of percentage thresholds for trends

No justification information

13.2 Trans-boundary assessment

Three salmon populations in Wales are shared with England: the Dee, Severn and Wye. Following previous practice, all of the Dee and Wye have been included in the Welsh figures, whereas the Severn will be included in the English figures.

13.2 Other relevant information

No other relevant information

14. References

Biogeographical and marine regions

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Main pressures

8.2 Sources of information

No sources of information

15. Explanatory Notes

Field label	Note
2.4: Distribution map; Method used	The 10 km square mapped range is based on records from annual & six yearly NRW juvenile salmonid surveys conducted using a standardised electric fishing technique. This widespread species is expected to be present in the majority of water courses (NRW, 2017b). The species range in Wales has not significantly changed since the previous report in 2019 (Garrett, 2019) (Figure 1), although this coarse scale would not detect localised variation.
3.2: Which of the measures in Art. 9a have been taken?	Rod fishing licences are available for the open fishing season which usually extends from March-April to October-November (dates are river-specific – see NRW 2023). Catch and release is mandatory across all rivers in Wales and it is an offence to sell, barter or exchange for goods rod caught salmon. There are also restrictions on the types of lure and baits that may be used to fish for salmon. There are currently catch & release (C&R) restraints and, on some rivers, daily and weekly limits on the numbers of fish that can be taken. The current byelaws also describe restrictions on the use of bait, lures, lead weights, keepnets, gaffs & tailers. All salmon taken in estuarine net fisheries in Welsh waters must be released if caught (NRW 2024a). Full details of the relevant byelaws are published in NRW (2017)
5.3: Short-term trend; Direction	There is no evidence of a recent decline in range.
5.7: Long-term trend; Direction	The range of salmon at the start of the period is considered to be very similar to the current range. It is possible that range has even increased somewhat due to removal of barriers to migration and improved water quality in post-

	industrial rivers, but there are insufficient data to quantify this.
5.11: Change and reason for change in surface area of range	NRW juvenile salmonid data from 2007 was mapped as 10 km grid squares. The 10 km scale is probably too coarse to detect changes and although there appears to be slight variation in the distribution of occupied 10 km grid squares it has probably remained quite stable since 2013 (comparisons show some variation on the Wales /England country border with one or two additional squares on the Lleyn peninsula & Pembrokeshire coast). (JNCC, 2013; NRW, 2017b).
6.2: Population size	This is the five year mean population size for Wales between 2019 and 2023, the most recent year for which figures are available. There is a declining population trend over this period (see also 6.7) and the 2023 estimate of 8,593 fish is the lowest since the model was applied in 1997.
6.6: Population size; Method used	The estimate is compiled from rod catch return data.
6.7: Short-term trend; Period	This period corresponds with the 15 year (3 generation) time used by the IUCN Assessment (Nunn et al. 2023).
6.9: Short-term trend; Magnitude	c) Pre-defined range Using rod catch data, Nunn et al. (2023) estimated a decline of 79% in the population size of Atlantic salmon in Wales over the last 15 years (3 generations), leading them to conclude it should have a Wales Red List status of Endangered. Recalculation of this using the most recent data suggests an even steeper decline of 86% (Hatton-Ellis 2025 - Figure 6.1). f) Rate of decrease See Hatton-Ellis (2025) Figure 6.1. The measured declines using the egg deposition model correspond to a 4% annual decline in population size since 2009. If current trends continue this may result in extinction of Atlantic salmon in

	much of Wales as a breeding species by 2030, with only the Wye and Dee populations likely to persist for longer.
6.10: Short-term trend; Method used	The data have been updated with the latest information and the NRW / Environment Agency spawner model has been used, which uses rod catch taking into account stock components, sex ratios and exploitation rates by river to estimate total number of spawners for all major salmon rivers. Although this does not include every catchment, the data closely reflect national trends and well over 90% of the total population size.
6.13: Long-term trend; Magnitude	a-c) Magnitude There has been an 83% reduction in population size between 1956 and 2009. d) Rate of decrease The long-term year on year rate of decline is 1.18%, reflecting periods of relative stability between around 1952 and 1990. Since 1990 there has been a consistent and rapid decline in populations.
6.14: Long-term trend; Method used	Estimates of returning salmon stocks and spawner numbers are available for all Principal Salmon Rivers in Wales (and England) from 1994 onward – modelled primarily from nationally collected rod licence catch returns (or, in a few cases, enumerated more directly using fish traps or automated counters). These estimates are integral to mandated stock assessment processes centred around the annual evaluation of compliance with Conservation Limits. Prior to 1994, rod catch data alone provide the main indicator of salmon stock abundance – collected via river or regional level catch return systems. Rod catch data collected prior to 1994 have been converted to returning stock and spawner estimates using simple regression relationships between catch and stock

	developed from the data set for 1994 onward (Hatton-Ellis 2025 - Fig 6.2). The purpose of these transformations is to express stock levels in common units of abundance and provide insight into probable trends over the longer (~70 year) term. Long-term trends are based on rod catch data from Wales. Rod catch data are available from a selection of Welsh salmon rivers from 1952 onwards, but prior to 1956 data were missing from the Taf, Teifi and Tywi.
6.18: Age structure, mortality and reproduction	Index river monitoring across England and Wales indicates there have been marked changes in the contribution of 1SW and MSW salmon to returning stocks in the last few years – with grilse numbers falling sharply post ~2010, Others have observed similar, and there are patterns in national (catch) derived data sets that support these observations. Compared to the 1980s, both 1SW & MSW returning adults have declined due at least in part to high mortality rates at sea. For example, in the Dee (Wales), the mean return rate of 1SW fish was 3.8% between 1993 and 2002, whereas mean return rates in the 2010s have been less than 1.6%. Comparable figures for MSW fish are 2.7 and 2.2% respectively (Hatton-Ellis 2025 – Figure 6.3). Data from the River Bush in Northern Ireland, where available datasets are longer, indicates an even clearer and more pronounced pattern especially for 1SW fish where return rates have fallen from around 30% in the 1980s to less than 5% recently (Hatton-Ellis 2025 – Figure 6.4),. Factors affecting survival at sea is constraining the abundance of the salmon population (ICES, 2017, 2021; NRW, 2017a). There are some signs of a recent improvement in the multi sea winter stock component, but it is still too early to determine whether this is a sustained trend.

7.1: Sufficiency of area and quality of occupied habitat	Occupied area Freshwater = YES Marine = NO Welsh river connectivity could be improved by removing full barriers to fish passage and allowing salmon access to additional suitable habitat. Much progress has been made (see section 9, Species Conservation Measures) but more remains to be done. In the marine environment, the habitat is affected by the impacts of ocean current oscillations and variations in temperature, salinity and pH regimes. Climate change is thought to have significantly reduced the area of suitable marine habitat for post-smolt salmon, (Olmos et al. 2020; Thorstad et al. 2021; Gillson et al. 2022; Vollset et al. 2022). Occupied habitat Freshwater = NO Estuarine = NO Coastal = NO Marine (Non Welsh Waters) = NO The 2021 ecological status of freshwater water bodies in Wales was classified as follows; 9 Bad (99km length), 60 Poor (516 km length), 333 Moderate (3238 km length), 315 Good (3292 km length), 0 High. In Wales most of the river habitat quality can be classed as close to the Good-Moderate boundary (NRW, 2015). Freshwaters are key migratory, spawning and nursery habitat. The 2021 status of transitional (estuarine) water bodies in

	Wales was as follows: 1 Poor (11 km2); 27 Moderate (690 km2); 4 Good (17 km2). Transitional waters are key migration route habitat. The 2021 status of coastal waters in Wales was as follows: 14 Moderate (3227 km2); 6 Good (1056 km2); 1 High (47 km2). Coastal waters are key migration route and feeding habitat. There is a major climate-driven ecological shift in the North East Atlantic which has resulted in a serious reduction in the survival of salmon at sea (Vollset et al. 2022). This habitat change is likely responsible for the population declines in all Welsh salmon stocks, and imperils the future survival of the species. Unoccupied habitat area and quality Apart from comparatively small areas above artificial barriers, salmon currently occupy all suitable habitat in Wales. It is unlikely that barrier removal can substantially alter the overall situation.
7.2: Sufficiency of area and quality of occupied habitat; Methods used	WFD classification is carried out over most of Wales according to standardised methods.
7.4: Short-term trend; Direction	The Water Framework Directive requires that water bodies are classified and reasons for failure are listed for those failing to meet Good Ecological Status.
7.5: Short-term trend; Method used	WFD classification data cover all water bodies in Wales.
8.1: Characterisation of pressures	Pressures: Salmon are exposed to a wide variety of pressures, reflecting the wide range of habitats that they use for spawning, feeding & migration. Climate change (PJ11, PJ01, PX02): Climate change is a pressure on both the freshwater & marine environment. Salmon are cold water fish, and warmer temperatures at all stages affect survival and growth (Mills et al. 2013; Jackson

et al. 2018; Gregory et al. 2020; Thorstad et al. 2021). This is reflected in the widespread and consistent reductions in salmon numbers across Wales (see Section 6), which cannot be explained by more localised factors such as water quality issues.

Increased precipitation leading to unseasonal flooding & warmer than average river water temperatures were implicated in the marked drop in Welsh juvenile salmonid numbers (Gregory et al. 2020; NRW, 2017a; Bewes et al. 2019). Climate change also causes increasingly severe washout of eggs and increased diffused pollution under heavy downpours, and longer and more extreme droughts (Natural Resources Wales and Environment Agency 2019), such as those in 2020 and 2022.

Recent work on a pressure matrix for salmon has put 'Climate change- changing weather patterns / river temperatures' as the highest pressure in Wales in terms of impact and likely future development (NRW, 2024c).

Marine ecosystems in the Northeast Atlantic (PJ11, PJ01, PX02) have responded to ocean temperature changes by a shift towards a warmer regime leading to marked changes in the distribution & production of salmon food sources and a reduction in the carrying capacity of suitable marine habitat (Davidson & Hazlewood, 2007; ICES, 2012). In addition, the impact of climate change is also thought to have caused the timing of sea-bound migration to be poorly synchronised with conditions in the marine environment (Friedland et al, 2003; NASCO, 2010).

Barriers to fish migration (river connectivity) (PA23, PD02): modification or removal of artificial barriers that cause a permanent or temporary barrier to salmon migration will help enable access to additional habitat which may alleviate the impact of some of the additional pressures cited here.

Other physical modifications (PA23, PB24) to the water course can also affect instream carrying capacity by reducing wetted area, cover & food supply (JNCC, 2013), by increasing the flashiness of flow regimes, and by conveying pollutants more rapidly and effectively to the watercourse.

Exploitation & harvesting aquatic resources (PG01, PG13): Salmon by-catch in pelagic fisheries may be an issue but there is uncertainty in the estimates of numbers (NASCO, 2012). Pressures from commercial & recreational fisheries have decreased greatly but still play a part (JNCC, 2013).

Diffuse pollution (PA17, PC08, PK01, PK05): diffuse sources of pollution were one of the leading reasons for WFD river water bodies being non-compliant for fish & failing to reach Good Ecological status (Natural Resources Wales and Environment Agency 2019). Diffuse pollution mainly arises from agricultural management, accidental discharges and some abandoned mines, especially those that release sediment into water courses (NRW, 2015).

Point source pollution (PK01, PA17) discharges from waste water treatment works are a significant contributor in some localised areas. Oestrogen mimics from industrial discharges are thought to weaken or kill salmon at the juvenile stage (JNCC, 2013) Certain agricultural practices are also implicated in point source pollution incidents although these have decreased in recent years (NRW, 2015).

Air pollution (PK01): nitrogen oxides (NOx) and sulphur oxides (SOx) are emitted when fossil fuels are burnt. These air pollutants impact water quality and although there have been clear and measurable improvements in water chemistry, biological recovery has been more intermittent (NRW, 2015). Freshwater acidification remains a long term pressure in some parts of upland Wales (Kowalik et al, 2007).

Invasive non-native species (INNS) (PI01): Non-native signal crayfish (Pacifastacus leniusculus) predate salmonid eggs and research shows that the greater the density of signal crayfish in a river section, the lower the density of Atlantic salmon (Peay et al, 2009).

Threats:

Threats are generally similar to pressures although horizon scanning suggests that the impact of some pressures may increase in the next decade.

INNS could spread more easily because of climate change and affect wild salmon health. Potentially damaging INNS include non-native crayfish (Pacifastacus leniusculus), pink salmon (Oncorhynchus gorbuscha) and salmon fluke (Gyrodactylus salaris.(CEFAS, 2017; JNCC, 2013). The latter is a parasite that has been identified as one of six primary challenges facing the conservation and management of wild Atlantic salmon in the North Atlantic (NASCO, 2016).

Pink salmon have recently been recorded in England and Scotland and while there is no immediate threat to wild Atlantic salmon in terms of competition for spawning sites and juvenile recruitment, there is a risk of this species introducing novel parasites or diseases to native wild salmonids. To date, only one pink salmon has been recorded in recent years in Wales during 2019. (NRW, 2018d).

Topmouth gudgeon (Pseudorasbora parva), is a non-native coarse fish which is the vector for the parasite Sphaerothecum destruens. This multi-fish species pathogen cases 90% mortality in Atlantic salmon. There are two known populations of topmouth gudgeon in the Llanelli area, but the potential impact on Welsh salmon population is not currently known.

Energy production (PD01): additional renewable energy developments around the Welsh coastline (NAW, 2013), may lead to disruption / delay in fish migration. The impacts on salmon and potential adaptive management techniques require further investigation (Gill & Bartlett, 2010).

The number of hydropower installations may also increase in the near future to help meet the demands of the Welsh Government's aspiration for Wales to generate 22.5 Gigawatts of installed capacity from different renewable energy technologies. (NAW, 2013; EU, 2009; EU, 2009). In rivers poor operational or infrastructure design could negatively impact salmon through entrainment, create adverse changes to flow regimes & habitat, lead to changes in river connectivity, increase disturbance etc.

Climate change (N): oscillation in ocean currents and further increases in temperature, storminess and drought are a likely threat to salmon populations (Delworth et al, 2016). Climate impact is expected to intensify over the next 20-30 years.

Pesticides (PA14, PA15, PA17): studies suggest that low levels of cypermethrin (a pesticide) in the aquatic environment may have a significant effect on Atlantic salmon populations through disruption of reproductive functions (Moore & Waring, 2001). Increasing temperatures as a result of climate change, may enhance the toxicity of pesticide contaminants and also lead to increased run-off. The threat posed by the synergistic interactions between climate change and pesticide exposure requires more research (Noyes, et al. 2009).

Microplastics (PJO1): Currently there is very little research on the impact in rivers although researchers from the University of Manchester have called for tighter regulations on waste flowing into urban waterways, after the first study

	of its kind found that microplastics from urban river channels are a major contributor to the pollution problem in the oceans (Hurley et al, 2018). Studies into the impact of marine plastics show overwhelming evidence that this pollution is a threat to marine biodiversity which is already at risk from overfishing, climate change and other forms of anthropogenic disturbance (Derraik, 2002).
9.5: List of main conservation measures	Maintaining the productive capacity of salmon freshwater habitat will require integrated catchment management planning to identify risks and prioritise the implementation of measures to address them. For example: The Welsh Government Glastir agri-environment scheme prescriptions for planting of bankside vegetation to create shade, changes to land use and upland land drainage schemes may mitigate some of the expected effects of climate change and reduce diffuse pollution (Welsh Government, 2018). This scheme is currently being replaced by a new scheme, provisionally titled the Sustainable Farming Scheme (SFS). Removal / re-modelling of existing artificial barriers to migration should be implemented when managing maintenance works or installation of new infrastructure projects in rivers (NRW, 2018c). Since the last assessment, two LIFE river restoration projects, LIFEDeeRiver and 4Rivers4LIFE (covering the Teifi, Tywi, Usk and Cleddau SAC rivers), have been actively removing barriers to migration or installing easements, thereby improving both upstream and downstream access for migrating salmon and smolts. In addition to ongoing work under the Salmon for Tomorrow 2 Programme work delivered by the Rivers Trusts as part of the Inland Fisheries Habitat Grant, 77 barriers to migration have been improved across Wales since 2020. This has improved access for salmon to 967km of river (NRW, 2024b). The two LIFE projects above, plus a third project, the Upper Wye Project, have been actively working with farmers to

	limit stock access to riverbanks (MA10). This has various benefits for salmon including reducing runoff and bank erosion; increasing the amount of shade, habitat diversity and cover for juveniles; improving oxygen levels in the water body; and the availability of terrestrial insect prey. Similar work is being carried out by Opportunity Catchments projects, NRW's Phys Mods project, the Sustainable Fisheries Programme and the Salmon for Tomorrow 2 Programme, as well as various mitigation schemes. In total, 855km of river has been improved across Wales since 2020 (NRW, 2024b). Byelaws to control net & rod angling were introduced in 2020, 2021, and 2023. Additional controls are proposed for 2025 closing the Dee net fishery. See section 3.2 for further details of control of fishing practises. NRW enforces fishing regulations and takes action against illegal fishing activities (NRW, 2018c). NRW continues to monitor water quality in water bodies & investigate and enforce reasons for not achieving WFD and SAC targets. Whilst the resource directed at conserving salmon is significant, it is not clear whether it will be sufficient to prevent extinction of salmon in Wales, due to the wider issues affecting the species in relation to climate change and in the North East Atlantic.
10.1: Future trends and prospects of parameters	Range: Atlantic salmon in Wales are declining at unprecedented rates, and predictive modelling indicates that many populations may be extinct within the next few decades if current conditions continue. Current projections suggest that only three of Wales's Principal Salmon Rivers are likely to still sustain a functional salmon population by 2030 (Hatton-Ellis 2025 - Appendix 3). These are the Wye, Dee, and Dysynni.

	The high likelihood of more or less simultaneous population extinctions across Wales makes large-scale contractions in range almost inevitable. A 50% or more contraction in range is likely by 2030. Population: Salmon have been declining at approximately 4% per year over at least the last 15 years, and all populations are currently on an extinction trajectory (Hatton-Ellis 2025 - Appendix 3). Habitat for the species: Habitat quality is likely to deteriorate further due to the impacts of climate change. However, current marine habitat is unsustainably poor to support salmon populations in Wales over the long term. Freshwater and estuarine habitats are also likely to decline further via effects such as winter warm periods, summer heatwaves, low flows, and increased storminess causing washouts of eggs. All of these have been observed in the recent past, sometimes with catastrophic impacts on recruitment, and are predicted to increase in frequency and severity in the future.
11.1: Range	Conclusion on Range reached because: (i) the short-term trend direction in Range surface area is stable; and (ii) the current Range surface area is not more than 10% below the Favourable Reference Range.
11.2: Population	Population is assessed as Unfavourable – Bad because: (i) the short-term trend direction in Population size is decreasing by more than 1% per year; (ii) the current Population size is more than 25% below the Favourable Reference Population and

	iii) reproduction, mortality and age structure strongly deviating from normal
11.3: Habitat for the species	Habitat for the Species is assessed as Unfavourable – Bad because the habitat for Atlantic salmon in the Northeast Atlantic is of insufficient quality to sustain a population in Wales over the long term, and there is no suitable unoccupied habitat. Freshwater and marine inshore habitat would be assessed as Unfavourable – Inadequate.
11.4: Future prospects	Future prospects are assessed as Unfavourable – Bad because the future prospects of range, population and habitat for the species are all bad due to climate change.
11.5: Overall assessment of Conservation Status	Atlantic salmon is assessed as Unfavourable – Bad because Population, Habitat for the Species and Future Prospects are all assessed as Bad.
12.1: Population size inside the pSCIs, SCIs and SACs network	Cleddau (Site is SAC, but salmon is not a qualifying feature): 124 Dee: 2,640 Glaslyn (Site is SAC, but salmon is not a qualifying feature): 27 Gwyrfai: No data Mawddach (Eden SAC): 390 Teifi: 974 Tywi (Site is SAC, but salmon is not a qualifying feature): 2,096 Usk: 1,426 Wye: 3,392 Counts are for the whole river & not only units within the

	SAC boundary. The Dee & Wye are cross-border rivers and the RSE includes counts from the whole river system and not just from within the Welsh SAC boundary.
12.2: Type of estimate	This figure is a five year mean of the modelled number of spawners based on rod catch data.
12.3: Population size inside the network; Method used	The method used is the same as for the wider population (see 6), but only the SAC series has been assessed. The SAC series supports approximately 86% of the Welsh salmon population.
12.7: Short-term trend of habitat for the species within the network; Method used	This assessment is mainly based on water quality assessments (Hatton-Ellis and Jones 2021; Foster et al. 2024). Other key parameters such as migration routes and habitat structure have not recently been assessed.
6.15: Favourable Reference Population (FRP)	The UK-level FRV for population was developed by JNCC using an audit trail based on the year the FRV was first established and any changes made in subsequent reporting rounds. The audit may draw from any combination of the 2007, 2013, or 2019 Habitats Directive reports and reflects the full rationale used for the 2019 Article 17 reporting. Following expert review, a Wales-level FRV was derived based on population trend and abundance data specific to Wales, rather than adopting the UK-level value. The revised FRV has been set as unpublished GIS analysis indicated that the Wales FRP could be estimated at 33026 spawners, with the current population being 61% smaller at 12900 spawners. Therefore the operator of between 51% and 100% smaller than the FRP was selected.
5.10: Favourable Reference Range (FRR)	The UK-level FRV for range was developed by JNCC using an audit trail based on the year the FRV was first established and any changes made in subsequent reporting rounds. The audit may draw from any combination of the 2007, 2013, or 2019 Habitats Directive reports and reflects the full rationale used for the 2019 Article 17 reporting. Following expert review, a Wales-level FRV was derived based on distribution and trend evidence specific to Wales, rather than adopting the UK-level value.

The revised FRV has been set as unpublished NRW GIS analysis indicated that the Wales FRR could be 20,000 km2 with the current range being 3% smaller than this at 19,314. Therefore an operator of 'between 2% and 10% smaller than the FRR' was selected for this species.