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

2019-2024

Conservation status assessment for the species:

S1099 - River lamprey

(*Lampetra fluviatilis*)

Wales

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This report was produced by JNCC in collaboration with Natural Resources Wales.

This document should be cited as:

Natural Resources Wales and JNCC. (2026). Conservation status assessment for the species: S1099 River lamprey (*Lampetra fluviatilis*).

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: River lamprey

Distribution Map

Range Map

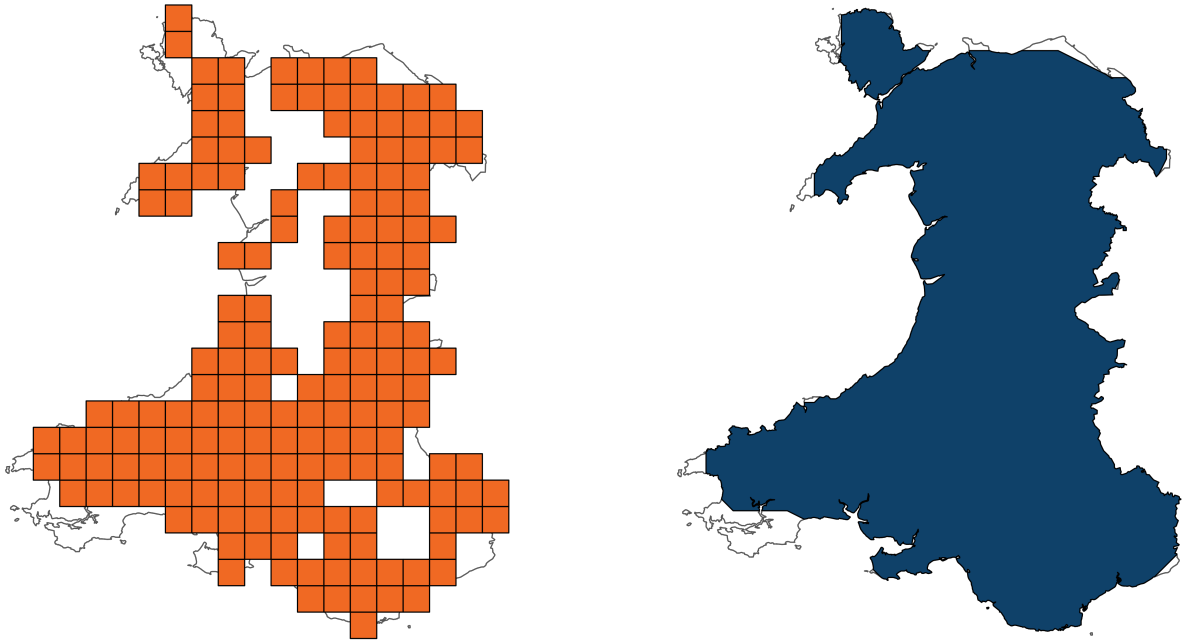

Figure 1: Wales distribution and range map for S1099 - River lamprey (*Lampetra fluviatilis*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority. 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 S1099 - River lamprey (*Lampetra fluviatilis*). 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-inadequate (U1)

Breakdown of Overall Conservation Status

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

List of Sections

National Level

1. General information

1.1 Country	Wales
1.2 Species code	S1099
1.3 Species scientific name	*Lampetra fluviatilis*
1.4 Alternative species scientific name	
1.5 Common name	River lamprey
Annex(es)	II, V

2. Maps

2.1 Sensitive species	No
2.2 Year or period	2013-2024
2.3 Distribution map	Yes
2.4 Distribution map; Method used	Based mainly on extrapolation from a limited amount of data

2.5 Additional information

No additional information

3. Information related to Annex V Species

3.1 Is the species taken in the wild / exploited?	No

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	No
c) Regulation of the periods and/or methods of taking specimens	No
d) Application of hunting and fishing rules which take account of the conservation of such populations	No

e) Establishment of a system of licences for taking specimens or of quotas	No
f) Regulation of the purchase, sale, offering for sale, keeping for sale, or transport for sale of specimens	No
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)	20,106.05
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	
e) Type of estimate	
f) Rate of decrease	
5.5 Short-term trend; Method used	Based mainly on extrapolation from a limited amount of data
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	Based mainly on extrapolation from a limited amount of data

5.10 Favourable Reference Range (FRR)

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

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	2019-2024

6.2 Population size (in reporting unit)

a) Unit	number of map 1x1 km grid cells
b) Minimum	
c) Maximum	

d) Best single value	1,988
6.3 Type of estimate	Best estimate
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	Based mainly on extrapolation from a limited amount of data
6.7 Short-term trend; Period	2013-2024
6.8 Short-term trend; Direction	Stable
6.9 Short-term trend; Magnitude	
a) Estimated minimum	
b) Estimated maximum	
c) Pre-defined range	
d) Unknown	
e) Type of estimate	
f) Rate of decrease	
6.10 Short-term trend; Method used	Based mainly on extrapolation from a limited amount of data
6.11 Long-term trend; Period	2001-2024
6.12 Long-term trend; Direction	Unknown
6.13 Long-term trend; Magnitude	

a) Minimum	
b) Maximum	
c) Confidence interval	
d) Rate of decrease	
6.14 Long-term trend; Method used	Insufficient or no data available

6.15 Favourable Reference Population (FRP)

ai) Population size	
aii) Unit	
b) Pre-defined increment	Current population is less than 5% smaller than the FRP
c) Unknown	No
d) Method used	Reference-based approach
e) Quality of information	moderate

6.16 Change and reason for change in population size

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	

6.17 Additional information

No additional information

6.18 Age structure, mortality and reproduction deviation	Unknown

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	Based mainly on extrapolation from a limited amount of data
b) Sufficiency of quality of occupied habitat; Method used	Complete survey or a statistically robust estimate

7.3 Short-term trend; Period	2013-2024
7.4 Short-term trend; Direction	Uncertain
7.5 Short-term trend; Method used	Insufficient or no data available

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
PL06: Physical alteration of water bodies (mixed or unknown drivers)	Ongoing and likely to be in the future	High (H)
PA23: Physical alteration of water bodies (including dams, channels, etc.)	Ongoing and likely to be in the future	High (H)
PL05: Modification of hydrological flow (mixed or unknown drivers)	Ongoing and likely to be in the future	High (H)
PL01: Abstraction from groundwater, surface water or mixed water (mixed or unknown drivers)	Ongoing and likely to be in the future	High (H)
PL04: Development and operation of dams (mixed or unknown drivers)	Ongoing and likely to be in the future	High (H)
PD02: Hydropower (dams, weirs, run-off-the-river and respective infrastructure)	Ongoing and likely to be in the future	High (H)
PA17: Agricultural activities generating pollution to surface or ground waters (including marine)	Ongoing and likely to be in the future	High (H)
PA20: Live stock farming generating pollution	Ongoing and likely to be in the future	High (H)
PK01: Mixed source pollution to surface and ground waters (limnic and terrestrial)	Ongoing and likely to be in the future	High (H)
PA19: Agricultural activities generating soil pollution	Ongoing and likely to be in the future	Medium (M)
PL02: Drainage (mixed or unknown drivers)	Ongoing and likely to be in the future	Medium (M)
PJ14: Other climate related changes in abiotic conditions	Ongoing and likely to be in the future	Medium (M)
PA21: Active abstraction of water for agriculture	Ongoing and likely to be in the future	Medium (M)

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
MK01: Reduce impact of mixed source pollution	High (H)
MK02: Reduce impact of multi-purpose hydrological changes	High (H)
MK03: Restoration of habitats impacted by multi-purpose hydrological changes	High (H)
MK04: Other measures related to mixed source pollution.	High (H)
MA10: Reduce/eliminate point or diffuse source pollution to surface or ground waters (including marine) from agricultural activities	High (H)
MC13: Other measures related to extraction and energy exploitation activities	High (H)
MS03: Restoration of habitat of species from the directives	High (H)
MJ01: Implement climate change mitigation measures	Medium (M)

MF04: Reduce/eliminate pollution to surface or ground waters from commercial, residential and recreational areas and activities, and from industrial activities and structures	Medium (M)
MA14: Other measures related to agricultural practices	Medium (M)
MC12: Manage water abstraction for resource extraction and energy production	Medium (M)
MA13: Manage agricultural drainage and water abstraction (incl. the restoration of drained or hydrologically altered habitats)	Medium (M)
MB10: Reduce diffuse or point source pollution to surface or ground waters (incl. marine) from forestry activities	Medium (M)
MB14: Manage drainage and water abstraction for forestry (inc. restoration of drained or hydrologically altered habitats)	Medium (M)
MC04: Reduce impact of hydropower operation and infrastructure (incl. the restoration of freshwater habitats)	Medium (M)
MF09: Adapt the management of water abstraction for public supply and for industrial and commercial use to reduce negative impacts on habitats and species (incl. restoration of habitats)	Medium (M)

9.6 Additional information

No additional information

10. Future prospects

10.1a Future trends of parameters

ai) Range	Overall stable
bi) Population	Overall stable
ci) Habitat for the species	Overall stable

10.1b Future prospects of parameters

aii) Range	Good
bii) Population	Good
cii) Habitat for the species	Poor

10.2 Additional information

No additional information

11. Conclusions

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

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 map 1x1 km grid cells
b) Minimum	

c) Maximum	
d) Best single value	660
12.2 Type of estimate	Best estimate
12.3 Population size inside the network; Method used	Based mainly on extrapolation from a limited amount of data
12.4 Short-term trend of population size within the network; Direction	Stable
12.5 Short-term trend of population size within the network; Method used	Based mainly on extrapolation from a limited amount of data
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	Complete survey or a statistically robust estimate

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

No trans-boundary assessment information

13.2 Other relevant information

No other relevant information

14. References

Biogeographical and marine regions

4.2 Sources of information

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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 extracted from the National Fish Populations database held on Kieco (NRW, 2024a). This widespread species is expected to be present in the majority of water courses although it is expected that both Lampetra species would be naturally absent from upland streams. Records of both Lampetra fluviatilis and Lampetra spp. have been used to generate this distribution. Records in NRW's fish database can come from targeted lamprey ammocoete surveys as well as NRW's core electro-fishing survey work which primarily targets salmonids. There were no lamprey specific surveys carried out between 2019-2024 but silt beds were fished for ammocoetes as part of the core fish survey work and both Lampetra species were recorded as part of these surveys. The vast majority of records are of larval stage individuals (ammocoetes). Whilst it is not possible to distinguish between brook lamprey and river lamprey at the larval life stage, larval records have been included in this assessment because very little other data is available. The larval stage lasts between 4 – 6 years and the morphology of each species becomes more distinguishable as they grow and metamorphose towards adulthood (Hardisty, 2006). Adults do not inhabit silt beds where lamprey specific surveys are undertaken. Adults may be caught on core surveys as all fish species present are recorded, but this does not constitute many of the records.
3.1: Is the species taken in the wild/ exploited	There is some evidence of fishermen using lamprey as dead bait when angling for pike, zander, etc (Angling Times, 2017) but there is no commercial exploitation of lamprey in Wales for this market. All the “lamprey eel” bait

	used in the UK seem to be imported from mainland Europe (Maitland, 2003).
5.3: Short-term trend; Direction	Records from the 2019-24 reporting period indicates no substantial change in range compared to the previous reporting period. Both the 10km and 1km map for the current reporting period show a similar distribution compared to the previous reporting period. River lamprey are widespread throughout Wales, with fewer records in the more upland areas of Eryri, the Cambrians and Bannau Brycheiniog
5.11: Change and reason for change in surface area of range	The evidence suggests that the range has not changed since the previous two rounds of Article 17 reporting for Habitats Directive in 2013 and 2018. A similar approach using a combination of records and modelled data was used in 2013 and 2018 to calculate distribution (IAFG, 2017; NRW, 2013; 2017). In-river works for multiple fish species access, completed by NRW or others, during this reporting period may have improved access (NRW, 2024b). However for this particular species the evidence for impact on range is limited and consequently not deemed to have changed range. River lamprey are under-recorded in Wales and there is very little regular monitoring activity outside the SAC network. The range is therefore likely to be an underestimate.
6.2: Population size	There is no specific survey in place for river lamprey in Wales, they are recorded as by-catch in routine surveys for salmonids and other fish species. As a non-target species river lamprey tend to be under-represented in these surveys and only recorded on a presence/absence basis. The majority of data for the current cycle has been extracted from the National Fish Populations database held on Kieco (NRW, 2024a). This measure includes both squares containing actual river lamprey records, and squares along the river network that

	river lamprey must have accessed to reach these squares, following the procedure agreed by IAFG (2018). The resulting count gives a reasonable estimate of the number of occupied 1km squares of river lamprey in Wales. River lamprey are significantly under-recorded in Wales and there is very little monitoring outside the SAC network. The population is therefore likely to be an underestimate. In addition, the modelling approach tends to overemphasise the important of upstream spawning locations that may be of marginal importance to the overall population. The current population size is a slight reduction compared to the previous reporting round (92%), but this is likely to reflect variation in the sampling effort and / or natural variation rather than a cause for concern. Sampling effort was much reduced in 2019-2024 compared with 2013-2018, partly due to covid restrictions and partly due to monitoring resource.
6.3: Type of estimate	River lamprey is under recorded in Wales and we therefore think it likely this is an underestimate.
6.6: Population size; Method used	Lamprey data were extracted from the National Fish Populations Database (NFPD) on Kieco 2019-2024 – which consists of data collected by Environment Agency Wales and its successor body Natural Resources Wales (NRW, 2024a). Using Arc View GIS, the records were converted to 1 x 1 km squares. Counts of 1 x 1 km grids with positive records (occupied) and assumed occupation were completed to calculate the micro distribution as a proxy for population size. This data was interpreted using guidance agreed with Inter-Agency Freshwater Group (IAFG, 2018).
6.8: Short-term trend; Direction	Nunn et al. (2023) assessed the extinction risk of river lamprey as least concern in Wales using the Red Data List criteria. Whilst this does not imply that there is no concern about river lamprey and the methodology based on 1km occupancy and assumed occupancy to assess population in the current assessment may mask trends in actual

	population size, the population does appear to be broadly stable.
6.12: Long-term trend; Direction	Not applicable- data from 2007 report and previous is not comparable due to new methodology in 2018.
6.18: Age structure, mortality and reproduction	This would require analysis of the age histograms of fish caught, unfortunately it has not been possible to carry this out for the current reporting round. However there is no reason to think that age structure, mortality or reproduction are deviating from normal.
7.1: Sufficiency of area and quality of occupied habitat	Occupied habitat area 1988km of river. Note that this is length of river based on waterbodies rather than actual area of habitat. Partial and permanent artificial barriers reduce river lamprey access to suitable freshwater habitat. Occupied habitat quality Water quality requirements in the freshwater and marine environment are unknown but it is assumed that Good Ecological Status (GES) is required (WFD classification). Of 406 river water bodies with river lamprey present, less than half are in good status based on 2020-2023 data (NRW 2024c). River lamprey migrate through all 32 transitional water bodies except five and the majority of these are classed as Moderate except Burry Inlet which is Poor (NRW 2024c). Reasons for failure to reach GES include levels of Dissolved Inorganic Nitrogen, mercury compounds, tributyltin based biocides and organobromine compounds. In additional, river lamprey potentially use all 23 coastal waterbodies; the majority (71%) of these are at moderate status overall and 30% are at good status (NRW 2024c). Recent condition assessments in the three marine SACs

	for which river lamprey is a designated feature (Cardigan Bay, Pembrokeshire Marine and Carmarthen Bay and Estuaries) concluded that water quality is an issue across all three SACs. This is due to levels of contaminants including mercury and cybermethrin (Wynter et al 2025). Unoccupied habitat Total area of unoccupied suitable habitat in Wales is estimated to be 2260km. Note that this is length of river based on waterbodies rather than actual area of habitat. The applicability of river habitat data to river lamprey is uncertain but it is assumed that Good Ecological Status (GES) represents habitat quality sufficient to support the feature in favourable conservation status. River lamprey depend on different habitats at each stage in their complex life history. These habitats are: clean river gravels for spawning and organic silt and sand beds in shallow river water (< 1 metre) for the lengthy larval stage. Adults inhabit estuaries and shallow coastal waters where a wide range of prey fish species are available (IUCN, 2017). There is no reliable river lamprey freshwater habitat dataset for Wales although there is no reason to believe that extent of river lamprey is declining. Modifications to artificial river obstructions would allow access to additional suitable habitat, for instance the Canaston and Haverfordwest weirs are affecting lamprey access from the Pembrokeshire Marine SAC into the Afonydd Cleddau SAC (Wynter, 2024). There is very little known about river lamprey estuarine and coastal waters habitat and their quality requirements.
7.2: Sufficiency of area and quality of occupied habitat; Methods used	Area Area of habitat was based on the intersection of the population distribution data for river lamprey with the WFD waterbody layer and a total river length calculated. This is

	broadly similar with the area in the previous reporting round if calculated using the same method. Quality Quality of habitat was based on the ecological status (under the Water Framework Directive) of all water bodies with river lamprey present. Firstly, a list of all water bodies which intersected with the km2 of river lamprey habitat was ascertained. Habitat quality was assessed using WFD 2024 river quality classification data for Wales (NRW, 2024c). Due to limited range data, no attempt was made to remove upland water bodies where lamprey may be absent. The applicability of river habitat data to river lamprey is uncertain but it was assumed that Good Ecological Status (GES) represented habitat quality sufficient to support the feature in favourable conservation status (JNCC, 2015). Of the 406 river water bodies with river lamprey present, four are bad (1%), 34 are poor (8%), 190 (47%) are moderate and less than half (178 water bodies, 44%) are in good status based on 2020-2023 data (NRW 2024c). Quality of transitional and coastal waterbodies is also relevant and the majority of those water bodies are also at moderate status (NRW 2024c).
7.5: Short-term trend; Method used	We would not advocate comparison of changes in water body classification between reporting cycles as a method for assessing the availability and quality of suitable habitats. There is uncertainty around presumed habitat occupation and over the impact of barriers where fish passage issues have been addressed as river lamprey are not always the target feature. In terms of habitat quality, it is unclear whether good ecological status sustains an appropriate habitat. No appropriate repeat habitat survey datasets were available to analyse trends.
8.1: Characterisation of pressures	River lamprey are exposed to a variety of pressures, reflecting the wide range of habitats that they use for

spawning, feeding and migration. The main pressures are habitat destruction (e.g. dredging of depositional habitats essential to larval lampreys), engineering works (particularly dams that act as barriers to migration and alter natural stream flow regimes), pollution and changes to their prey base (Maitland et al, 2015).

Physical modifications

Physical modifications (e.g. dams, weirs and other waterbody modifications) resulting in morphological changes and artificial barriers are the leading pressure on river lamprey in the freshwater and estuarine environment (Maitland, 2003; Jubb et al, 2023). River lamprey migrate within the river from spawning to nursery grounds and also to and from the sea and need clear migratory pathways. Modification or removal of artificial barriers that cause a permanent or temporary barrier to river lamprey migration will help enable access to additional habitat which may alleviate the impact of some of the pressures cited here. However, there are still significant numbers of dams and weirs in rivers occupied by river lamprey.

Other physical modifications to the water course, can affect instream carrying capacity by reducing wetted area and changing the characteristics and dispersal of silts (JNCC, 2015). Abstractions and discharges are regulated but physical modifications are unlikely to have been through a similar process and can have significant ongoing impacts.

Flow

There is an increasing demand for water resources from water transfers and local abstractions. The resulting lower flows could have a negative effect on river lamprey life stages. Lamprey species are also known to become entrained in abstraction infrastructure if inappropriate screening is in–situ. (Hardisty, 2006; Garrett & Thomas, 2012).

General water pollution may affect larval habitat and development although they are not thought to be particularly sensitive to water pollution (Dawson et al, 2015; Maitland, 2003).

The impact of climate change on river lamprey is uncertain, although altered flow regimes would negatively affect habitat quality e.g. wash out of silt beds with loss of larvae and habitat, habitat fragmentation due to drought etc Dawson et al, 2015; Hardisty, 2006; Wilson et al, 2013.

Pollution

Although this species is not thought to be particularly sensitive to water pollution, general water quality will still impact on larval habitat and development (Dawson et al, 2015; Maitland, 2003). Lampetra larvae require silt although they cannot survive in silt with a high organic content because it has little or no oxygen (Natural England, 2001).

Diffuse sources of pollution are one of the leading reasons for WFD river water bodies being non-compliant for fish and failing to reach Good Ecological status (NRW 2025). Diffuse pollution mainly arises from agricultural management, accidental discharges and some abandoned mines, especially those that release sediment into water courses (NRW, 2015). Water quality in the marine environment is also a key pressure (Wynter et al 2025).

Climate change

Climate change is a pressure on both the freshwater and marine environment and the potential impact on river lamprey is uncertain. In rivers increased precipitation leading to unseasonal flooding and warmer than average river water temperatures could alter flow regimes and negatively affect habitat quality e.g. wash-out of silt beds

	during floods and / or habitat fragmentation due to drought (Dawson et al, 2015; Hardisty, 2006; Lasalle and Rochard 2009; Wilson et al, 2013). Marine ecosystems, in the Northeast Atlantic, have responded to ocean temperature changes by a shift towards a warmer regime leading to marked changes in the distribution of other fish species and oscillations in oceanic currents (Delworth et al, 2016). This could affect prey availability and quality for river lamprey. The overall impact on river lamprey populations is unknown although, as a thermophilous species, it is possible that some aspects of climate change could benefit the species (Moss, 2015: NRW, 2013).
9.1: Status of measures	Between 2019 and 2024, there has been an increase in work to restore natural processes in rivers, corridors and floodplains as well as work to address pollution across catchments in Wales. There are now several large scale river restoration projects (DeeLIFERiver, 4 Rivers for LIFE, Upper Wye) which have resulted in significant lengths of rivers improved. This is in addition to NRW's River Restoration Programme, Salmon for Tomorrow and work by external organisations such as the National Trust and Rivers Trusts across Wales via the Inland Fisheries Habitat Grant. Together, this work has improved, protected or restored 854km of river environment, created, protected or restored 100ha of river habitat, addressed 77 barriers to migration and improved access for migratory fish to 954km of river (NRW 2024c). Note this length will be significantly less for river lamprey as some of the fish passes put in place will be inaccessible to this species. There has also been significant work to reduce point source and diffuse pollution via Dwr Cymru's AMP7 programme of sewage treatment work improvements, NRW's SAC Rivers

	project and Welsh Government's Control of Agricultural Pollution regulations.
9.2: Main purpose of the measures taken	It should be noted that restoring habitat will also result in restoration of the range and population size of river lamprey in Wales.
9.5: List of main conservation measures	Measures are required to address pressures identified in Section 8. The highest priority actions are to continue to improve habitat quality for river lamprey and address barriers. Both of these are achieved through works designed to improve rivers for other fish including salmon and trout. The critical habitat requirements of adult river lamprey relate to the spawning and nursery habitats. Any significant alteration or management of channels that removes too much cover or creates long stretches of very fast flow (> 2 m s-1) must be avoided all along the migration route. Both water abstraction and land drainage have negative effects on lamprey populations. They often lead to unstable habitats with variable water levels, which flood and disturb spawning gravels and nursery silts at times but leave them high and dry at others (Maitland, 2003). Barriers are addressed via river restoration and fisheries projects. Where possible a fish pass will be designed to accommodate multi-fish species. Most schemes are realised through collaboration with local authorities and other agencies when wider projects arise. It is also recognised that diffuse and point source pollution should be addressed as poor water quality, especially siltation, will affect spawning habitat. Gravels should be oxic for burrowing larvae although they can survive anoxic conditions for short periods. Appropriate conservation measures should be implemented during river restoration projects and as good practice for river management during other infrastructure development /

	maintenance projects. Through existing legislation and good practice suitable estuarine conditions should be maintained and free from pollution. Sustainable populations of prey fish species should be available.
10.1: Future trends and prospects of parameters	Future prospects of range The range for river lamprey is not expected to alter significantly in Wales in the next 12 years assuming that more suitable habitat becomes accessible and that the magnitude of the impact of threats do not become too large e.g. excessive drought or flooding. Future prospects of populations River lamprey are a widespread species and not particularly sensitive species which does not appear to be under any immediate threat. The population seems to be stable in Wales and is expected to remain so. Future prospects of habitat for species Pressures and threats have been identified along with suitable conservation measures that will help safeguard habitat and prevent population decline. Appropriate conservation measures could be identified / implemented during river restoration projects and as good practice for river management during other infrastructure development / maintenance projects. These measures would potentially have a positive impact on habitat over the medium term and improve population resilience.
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 approximately equal to the Favourable Reference Range.
11.2: Population	Conclusion on Population reached because:(i) the short-term trend direction in Population size is stable; (ii) the

	current Population size is approximately equal to the Favourable Reference Population; and iii) reproduction, mortality and age structure does not have data available.
11.3: Habitat for the species	Conclusion on Habitat for the species reached because: (i) the area of occupied habitat is not sufficiently large for long-term survival of the species (ii) the quality of occupied habitat is not suitable for the long-term survival of the species; and iii) there is a not a sufficiently large area of occupied and unoccupied habitat of suitable quality for long term survival (iv) the short-term trend in area of habitat is uncertain; and v) expert opinion determines that the habitat quality of occupied and unoccupied habitat is not bad; and vi) expert opinion determines that the habitat area is insufficient, but not clearly so.
11.4: Future prospects	Conclusion on Future prospects reached because: (i) the Future prospects for Range are good; (ii) the Future prospects for Population are good; and (iii) the Future prospects for Habitat for the species are poor.
11.5: Overall assessment of Conservation Status	Overall assessment of Conservation Status is Unfavourable-inadequate because two of the conclusions are Unfavourable-inadequate.
12.3: Population size inside the network; Method used	This estimation includes both squares containing confirmed larval and juvenile river lamprey records, and squares along the river network that they may have accessed to reach these squares. The resulting count gives a reasonable estimate of the number of occupied 1km squares of river lamprey in the UK national site network in Wales.
12.4: Short-term trend of the population size within the network; Direction	Population size within the boundary of the six SAC rivers where river lamprey is a feature is stable.
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. This FRV was reviewed by Welsh experts and considered appropriate for use in Wales based on current population trends and abundance.
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. This FRV was reviewed by Welsh experts and considered appropriate for use in Wales based on current distribution and trends.