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

2019-2024

Conservation status assessment for the species:

S1095 - Sea lamprey

(*Petromyzon marinus*)

Wales

Cyfoeth Naturiol Cymru
Natural Resources Wales

JNCC

For further information please contact:

Natural Resources Wales, Welsh Government Offices, Cathays Park, King Edward VII Avenue, Cardiff, CF10 3NQ. https://naturalresources.wales

JNCC, Quay House, 2 East Station Road, Fletton Quays, Peterborough, PE2 8YY. https://jncc.gov.uk

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: S1095 Sea lamprey (*Petromyzon marinus*).

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: Sea lamprey

Distribution Map

Range Map

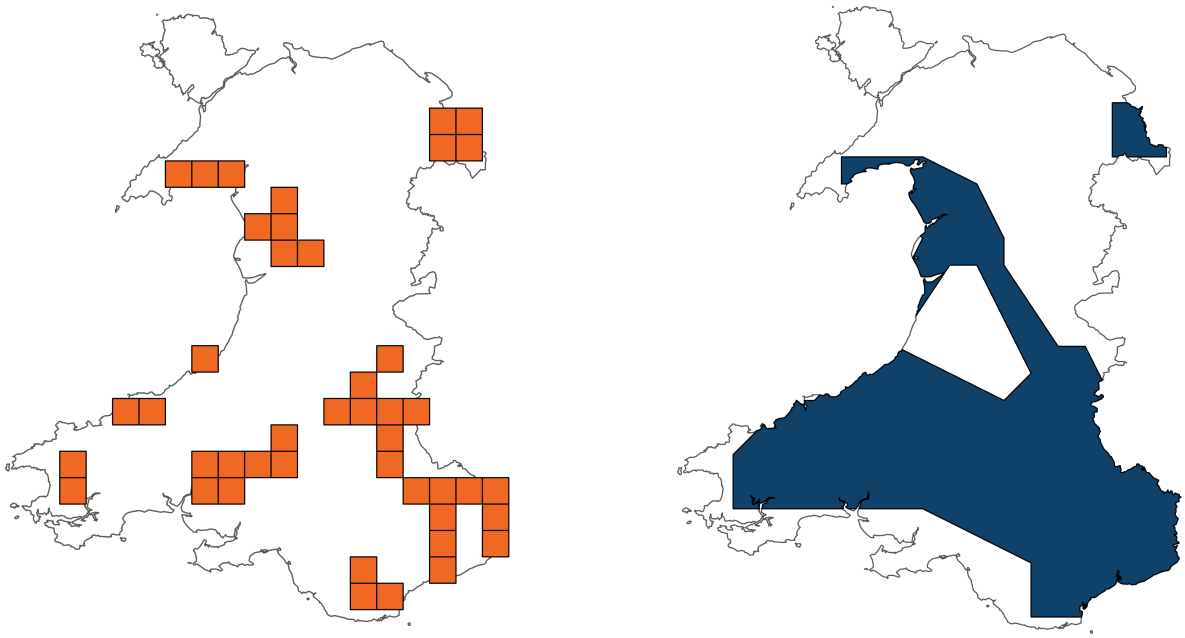

Figure 1: Wales distribution and range map for S1095 - Sea lamprey (*Petromyzon marinus*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority. The 10km grid square distribution map is based on available species records within the current reporting period.

Table 1: Table summarising the conservation status for S1095 - Sea lamprey (*Petromyzon marinus*). 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)	**Unfavourable-inadequate (U1)**
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	S1095
1.3 Species scientific name	*Petromyzon marinus*
1.4 Alternative species scientific name	
1.5 Common name	Sea lamprey
Annex(es)	II

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?

3.2 What measures have been taken?

a) Regulations regarding access to property
b) Temporary or local prohibition on the taking of specimens in the wild and exploitation
c) Regulation of the periods and/or methods of taking specimens
d) Application of hunting and fishing rules which take account of the conservation of such populations

e) Establishment of a system of licences for taking specimens or of quotas

f) Regulation of the purchase, sale, offering for sale, keeping for sale, or transport for sale of specimens

g) Breeding in captivity of animal species as well as artificial propagation of plant species

Other measures

Other measures description

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

a) Unit

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	-	-	-	-	-	-

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)	10,593.91
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	low

5.11 Change and reason for change in surface area of range

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

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	428
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 between 5% and 25% smaller than the FRP
c) Unknown	No
d) Method used	Expert opinion
e) Quality of information	

6.16 Change and reason for change in population size

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

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	Poor
cii) Habitat for the species	Poor

10.2 Additional information

No additional information

11. Conclusions

11.1 Range	Favourable (FV)
11.2 Population	Unfavourable-inadequate (U1)
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	292
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

Gill AB, Bartlett M, Thomsen F. 2012 Potential interactions between diadromous fishes of U.K. conservation importance and the electromagnetic fields and subsea noise from marine renewable energy developments. J Fish Biol. 2012, 81: 664-695. 10.1111/j.1095-8649.2012.03374.x.

APEM. 2014. Rivers Wye and Usk: lamprey monitoring 2013. Report for DCWW. Ref 412254_2013. APEM consultancy.

Bergstedt RA. & Seelye JG. 1995 Evidence for lack of homing by sea lampreys. Transactions of the American Fisheries Society, 124(2), 235-239.

Bird DJ, Potter IC, Hardisty MW & Baker BI. 1994. Morphology, body size and behaviour of recently-metamorphosed sea lampreys, Petromyzon marinus, from the lower River Severn, and their relevance to the onset of parasitic feeding. Journal of Fish Biology 44: 67–74.

Campbell D, Clark S. & Williams A. 2005. Lamprey surveys on the Rivers Tywi, Teifi and Cleddau. CCW Review of Consents Report No. 7.

Clabburn P & Davies RC. 2012. Monitoring adult Sea Lamprey (Petromyzon marinus) migration using a DIDSON imaging sonar on the Eastern Cleddau, March - June 2011. FAT/REP/11/05 FINAL DRAFT.

Clabburn P. 2015. DIDSON Assessment of adult sea lamprey migration on the Western Cleddau. NRW unpub. Report.

Davies, P., Britton, J.R., Nunn, A.D., Dodd, J.R., Bainger, C., Velterop, R. et al. (2021). Cumulative impacts of habitat fragmentation and the environmental factors affecting upstream migration in the threatened sea lamprey, Petromyzon marinus. Aquatic Conservation: Marine and Freshwater Ecosystems, 31(9), 2560–2574. https://doi.org/10.1002/aqc.3625

Davies R. 2016. Sea Lamprey monitoring on the River Tywi 2011 - 2014. NRW. Ref no.: NFAT/16/02.

Davies R & Griffiths J. 2012. Monitoring adult Sea Lamprey (Petromyzon marinus) migration using a DIDSON imaging sonar on the River Tywi 2009/10. Ref No. NAT/11/05. EA Report.

Davidson, IC, Hazlewood MS. 2008. Effect of climate change on salmon fisheries. Environment Agency Science Report No. W2-047/SR.

Dawson H., Quintella B., Almeida P., Treble A., Jolley J. 2015. The Ecology of Larval and Metamorphosing Lampreys. In: Docker M. (eds) Lampreys: Biology, Conservation and Control. Fish & Fisheries Series, vol 37. Springer, Dordrecht.

Delworth TL, Zeng F, Vecchi GA , Yang X, Zhang L & Zhang R. 2016. The North Atlantic Oscillation as a driver of rapid climate change in the Northern Hemisphere. Nature Geoscience, Volume 9, Issue 7, pp. 509-512.

Derraik JGB. 2002. The pollution of the marine environment by plastic debris: a review. Marine Pollution Bulletin Vol 44 Issue 9. Available: https://www.sciencedirect.com/science/article/pii/S0025326X02002205

aep-section-id14

Docker M (Ed). 2015. Lampreys: Biology, Conservation and Control. Volume 1. Fish and Fisheries Series, Volume 37. Edited Margaret F. Docker. Dordrecht Springer. ISBN: 978-94-017-9305-6.

Emmett B.E. and the GMEP team (2017) Glastir Monitoring & Evaluation Programme. Final Report to Welsh Government - Executive Summary (Contract reference: C147/2010/11). NERC/Centre for Ecology & Hydrology (CEH Projects: NEC04780/NEC05371/NEC05782). Available http://nora.nerc.ac.uk/id/eprint/518194/1/N518194CR.pdf

Griffiths, J. 2024. Use of an ARIS imaging sonar to assess long-term population trends of Sea Lamprey (Petromyzon marinus) in the River Tywi, Nantgaredig, Wales. 2015 - 2023.

Garrett H, Thomas Rh, Hatton-Ellis TW. 2013b. River Usk Population Attribute Condition Assessment for Brook, River and Sea Lamprey 2007-12. CCW Staff Science Report No. 11/8/6. Bangor, Countryside Council for Wales.

Garrett, HM. 2015. River Dee & Bala lake SAC population condition attribute condition assessment for brook, river and sea lamprey population 2014. NRW Evidence Report No: 40 31pp, NRW, Dolgellau.

Garrett HM. 2017. SAC monitoring summary note. River Wye SAC lamprey species population condition assessment. Reporting cycle 2013 – 2018. NRW. Bangor.

Garrett, HM. 2016. Afon Teifi SAC population attribute condition assessment for brook, river and sea lamprey population 2014. NRW Evidence Report No. 106. 28 pp. NRW. Bangor.

Garrett HM. In prep. River Usk SAC Monitoring Summary note Population attribute condition assessment for brook, river and sea lamprey population 2014 – 2015. Monitoring Round 2013 to 2018

Garrett HM, Thomas Rh. 2012. Afon Tywi Population Attribute Condition Assessment for Brook, River and Sea Lamprey 2011. CCW Staff Science Report No. 11/8/5. Bangor, Countryside Council for Wales.

Garrett, HM, Hatton-Ellis, TW & Thomas, Rh. 2013a. Afonydd Cleddau Population Attribute Condition Assessment for Brook, River and Sea Lamprey 2012. CCW Staff Science Report No. 13/8/1. NRW.

Gill AB, Bartlett M, Thomsen F. 2012 Potential interactions between diadromous fishes of U.K. conservation importance and the electromagnetic fields and subsea noise from marine renewable energy developments. J Fish Biol. 2012, 81: 664-695. 10.1111/j.1095-8649.2012.03374.x.

Griffiths J, Clabburn P and Davies RN. 2009. Evaluation of the DIDSON Multibeam imaging sonar as a tool for monitoring of adult Sea Lamprey (Petromyzon marinus) on the River Tywi. FAT/09/01. Environment Agency Internal Report.

Griffths, J. 2023. Use of an ARIS imaging sonar to assess Sea Lamprey migration (Petromyzon marinus) through Canaston weir, Eastern Cleddau, Pembrokeshire.

Griffiths, J. 2024. Use of an ARIS imaging sonar to assess long-term population trends of Sea Lamprey (Petromyzon marinus) in the River Tywi, Nantgaredig, Wales. 2015 - 2023.

Hardisty M. 2006. Lampreys. Life without jaws. Pub. Forrest text.

Hardisty MW. and Potter IC. 1971a. The behaviour, ecology and growth of larval lampreys. pp. 85-125. In The biology of lampreys, Vol 1. Ed. by MW Hardisty and IC Potter. Academic Press, London. UK

Hardisty MW and Potter IC. 1971b. The general biology of adult lampreys. pp. 127-247. In The biology of lampreys, Vol 1. Ed. by MW Hardisty and IC Potter. Academic Press, London. 466pp.

ICES. 2015. Report of the Workshop on Lampreys and Shads (WKLS), 27–29 November 2014, Lisbon, Portugal. ICES CM 2014/SSGEF:13. 206 pp.

Hurley R, Woodward J & Rothwell J. 2018. Microplastic contamination of river beds significantly reduced by catchment-wide flooding. Nature Geoscience volume 11, 251–257.

Interagency Freshwater Group (IAFG). 2017. UK Article 17 reporting. Procedure for estimating population (Inc. Favourable Reference Population) using 1km square resolution records data. December 2017. Interagency Freshwater Group.

Joint Nature Conservation Committee (JNCC). 2015. Common Standards Monitoring Guidance for Freshwater Fauna. Peterborough, Joint Nature Conservation Committee.

Jubb, W.M., Noble, R.A.A., Dodd, J.R., Nunn, A.D., Lothian, A.J., Albright, A.J. et al. (2023). Understanding the impact of barriers to onward migration; a novel approach using translocated fish. Journal of Environmental Management, 335, 117488. https://doi.org/10.1016/j.jenvman.2023.117488

Lasalle, G. and Rochard, E. 2009. Impact of twenty-first century climate change on diadromous fish spread over Europe, North Africa and the Middle east. Global Change Biology 15, 1072-1089.

Limburg KE, Waldman JR. 2009. Dramatic Declines in North Atlantic Diadromous Fishes, BioScience, Volume 59, Issue 11, 1 December 2009, Pages 955–965, https://doi.org/10.1525/bio.2009.59.11.7

Maitland PS. 2003. Ecology of the River, Brook and Sea Lamprey. Conserving Natura 2000 Rivers Ecology Series No. 5. English Nature, Peterborough.

Maitland, P.S., Renaud, C.B., Quintella, B.R., Close, D.A. & Docker, M.F. (2015). Conservation of native lampreys. In: M.F. Docker (Ed.) Lampreys: Biology, conservation and control, Vol. 1. Dordrecht: Springer, pp. 375–428. https://doi.org/10.1007/978-94-017-9306-3_8

Moss B. 2015. Biodiversity climate change impacts report card technical paper Freshwaters, climate change and UK conservation. Available https://www.ukri.org/wp-content/uploads/2021/12/101221-NERC-LWEC-InfrastructureReportSource17-FreshwatersConservation.pdf

National Assembly Wales. 2013. National Assembly for Wales Research paper Renewable Energy in Wales: in figures August 2013. Available https://senedd.wales/media/r1hmy2wo/13-059-english.pdf

Natural England. 2001. The uplands management handbook. Pub. NE. Peterborough. Available from: http://publications.naturalengland.org.uk/publication/82050

Natural Resources Wales. 2013. Supporting documentation for the Third Report by the United Kingdom under Article 17 on the implementation of the Directive from January 2007 to December 2012 Conservation status assessment for Species: S1096 – Sea lamprey (Petromyzon marinus). [http://jncc.defra.gov.uk/pdf/Article17Consult_20131010/S1096_WALES.pdf]

Natural Resources Wales. 2018. Supporting documentation for the Fourth Report by the United Kingdom under Article 17 on the implementation of the Directive from January 2013 to December 2018 Conservation status assessment for Species: S1096 – Sea lamprey (Petromyzon marinus).

Natural Resources Wales. 2015. Water Watch Wales maps gallery. Cycle 2 waterbodies and rivers. Available: https://nrw.maps.arcgis.com/apps/webappviewer/index.html?id=2176397a06d64731af8b21fd69a143f6

Natural Resources Wales. 2017. National Fish Populations database held on BIOSYS. Accessed December 2017.

Natural Resources Wales. 2024a. National Fish Populations database held on Kieco. Accessed December 2024.

Natural Resources Wales. 2024b. Unpublished fish survey data collected as part of the DeeLIFE river restoration project.

Natural Resources Wales. 2024c. Measures of river restoration activity. Unpublished data.

Natural Resources Wales 2025. Compliance assessment of SAC rivers in Wales against water quality targets. https://naturalresources.wales/evidence-and-data/research-and-reports/water-reports/water-quality/assessment-of-water-quality-in-wales-2024

NRW. 2017a. Indicative site level assessment. Migratory fish sea lamprey / Petromyzon marinus. Carmarthen Bay and Estuaries / Bae Caerfyrddin ac Aberoedd SAC.

NRW. 2017b. Indicative site level assessment. Migratory fish sea lamprey / Petromyzon marinus. Dee Estuary / Aber Dyfrdwy SAC.

NRW. 2017c. Indicative site level assessment. Migratory fish sea lamprey / Petromyzon marinus. Pembrokeshire Marine / Sir Benfro Forol SAC

NRW. 2017d. Indicative site level assessment. Migratory fish sea lamprey / Petromyzon marinus. Carmarthen Bay and Estuaries / Bae Caerfyrddin ac Aberoedd SAC.

NRW. 2017e. Indicative site level assessment. Migratory fish sea lamprey / Petromyzon marinus. Severn Estuary / Môr Hafren SAC

Nunn AD, Ainsworth RF, Walton S, Bean CW, Hatton-Ellis TW, Brown A, Evans R, Atterborne A, Ottewell D, Noble RAA. 2023. Extinction risks and threats facing the freshwater fishes of Britain. Aquatic Conservation: Marine and Freshwater Ecosystems 33: 1470-1476.

OSPAR commission. 2009. Background Document for Sea lamprey Petromyzon marinus. Biodiversity series 2009. Available https://qsr2010.ospar.org/media/assessments/Species/p00431_Sea_lamprey.pdf

Silva S, Araújo MJ, Bao M, Mucientes G, & Cobo F. 2014. The haematophagous feeding stage of anadromous populations of sea lamprey Petromyzon marinus: low host selectivity and wide range of habitats. Hydrobiologia, 734, 187-199.

Taverny C, Lassalle G, Ortusi I, Roqueplo C, Lepage M and Lambert P 2012. From shallow to deep waters: habitats used by larval lampreys (genus Petromyzon and Lampetra) over a western European basin. Ecology of Freshwater Fish, 21: 87–99. doi:10.1111/j.1600-0633.2011.00526.x

Tricas T, Gill A, Normandeau, Exponent: Effects of EMFs from undersea power cables on elasmobranchs and other marine species. 2011, Camarillo, CA: U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Regulation, and Enforcement, Pacific OCS Region, OCS Study BOEMRE 2011–09

Wilson L, McCall R, Astbury S, Bhogal A, Walmsley C. 2013.Climate Vulnerability Assessment of Designated Sites in Wales. CCW Contract Science Report No. 1017. CCW. Bangor.

Wye & Usk Foundation (WUF). 2009. Irfon Special Area of Conservation (ISAC) LIFE project. Available: http://webcam.wyeuskfoundation.org/isac/

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 a combination of records extracted from the National Fish Populations database held on Kieco, adult records and spawning records (NRW, 2024a., NRW 2024b, W. Hanks pers comm 2024). The increase in range in this reporting period compared with the previous is due to evidence of a population or populations based on spawning observations in the lower reaches of several rivers in Eryri including the Wen, Erch, Dwyfawr, Dwyfach and the Glaslyn. There are also new records in the main river stretches of the Taff, Ely, Thaw and Cadoxton in South Central Wales. This widespread species is expected to be present in the lower reaches of most catchments in Wales although sea lamprey will be naturally absent from upland streams and above natural barriers to migration such as waterfalls.
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 10km2 and 1km2 maps for the current reporting period show a similar distribution compared to the previous reporting period, with additions in the lower reaches of rivers in Eryri and South Central Wales. Sea lamprey are widespread throughout Wales but confined to lower reaches and absent throughout the more upland areas of Eryri, the Cambrians and Bannau Brycheiniog.
5.11: Change and reason for change in surface area of range	Sea lamprey continue to be widely distributed across Wales and there is no evidence to suggest that the range has changed significantly 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; NRW, 2018). The additional 10km squares which have led to an expansion in the distribution information reported are due to an increase in observer effort, partly due to local fisheries officers records of spawning (NRW 2024b; W. Hanks pers comm 2024). This is not a real change in distribution. In-river works for multiple fish species access, completed by NRW or others, during this reporting period may have improved access (2024c). However, for this particular species the evidence for impact on range is limited and consequently is not deemed to have changed range. Sea lamprey are significantly under-recorded in Wales and there is very little systematic monitoring outside the SAC network. The range is therefore still likely to be an underestimate.
6.2: Population size	Best Single Value = 428 1km squares as best single value This estimate includes both squares containing confirmed sea lamprey records (NRW, 2024a), and squares along the river network that they have either accessed to reach these squares or are considered likely to use (IAFG, 2017). The resulting count gives a reasonable estimate of the number of occupied 1km squares of sea lamprey in Wales. Sea 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. The current population size is an increase compared to the previous reporting round (29% increase), but this is likely to reflect variation in the sampling effort and / or natural variation rather than a real increase. The FRP is likely to be around 550 km2 based on

	knowledge of reduction in current population size due to barriers in rivers.
6.3: Type of estimate	Sea lamprey is under recorded in Wales and we therefore think it likely this is an underestimate.
6.6: Population size; Method used	Sea lamprey data were extracted from the National Fish Populations Database (NFPD) on Kieco 2019-2024. This consists of data collected by Environment Agency Wales and its successor body Natural Resources Wales (NRW, 2024a). In addition, records were derived from the monitoring work for the DeeLIFE project plus observations of sea lamprey spawning (NRW, 2024b, W. Hanks pers comm 2024). Using Arc GIS, the records were converted to 1 x 1 km squares. Counts of 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 sea lamprey as least concern in Wales using the Red Data List criteria. Whilst this does not imply that there is no concern about sea 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. Estimates of the total numbers of adult sea lamprey migrating up the Afon Tywi between 2015 and 2023 show that numbers are extremely variable, from an estimate of 743 in 2019, to 5858 in 2015 (Griffiths, 2024). Sea lamprey do not necessarily return to their natal rivers to spawn and so fluctuations can be due to this as well as to a number of environmental factors. Notwithstanding these factors, the total run size was still greater than 1000 in the majority of years. It is recommended that further data is collected to provide a longer time series.

6.12: Long-term trend; Direction	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 Freshwater: 428km of river. Note that this is length of river based on waterbodies rather than actual area of habitat. Marine: occupied area is sufficient for long term survival. Partial and permanent artificial barriers reduce sea 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 the 92 river water bodies with sea lamprey present, only a quarter are in good status based on 2020-2023 data (NRW 2024c). Sea 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, sea lamprey potentially use all 23 coastal water bodies; the majority (70%) of these are at moderate status overall and 30% are at good status (Data Map Wales, 2021; NRW 2024c).

	Recent condition assessments in the three marine SACs for which sea 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 freshwater habitat in Wales is estimated at 70km (using expert judgement of approximately 20% increase on current area of occupied habitat). Note that this is length of river based on waterbodies rather than actual area of habitat. 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 et al 2025). The applicability of river habitat data to sea lamprey is uncertain but it is assumed that Good Ecological Status (GES) represents habitat quality sufficient to support the feature in favourable conservation status. As the majority of river water bodies in Wales are at the moderate/good ecological status boundary, quality of habitat is unlikely to be sufficient for long term survival.
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 sea 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 sea lamprey present. Firstly, a list of all water bodies which intersected with the km2 of sea lamprey presence (known and presumed) was ascertained. Habitat quality was assessed using WFD 2024 river quality interim 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 sea 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 92 river water bodies with sea lamprey present, one is bad (1%), 18 are poor (20%), 50 (65%) are moderate and only a quarter (23 water bodies, 25%) 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 sea 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	Sea 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 in Wales 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; Davies et al 2021).

Physical modification

Physical modifications (e.g. dams, weirs and other waterbody modifications) resulting in morphological changes and artificial barriers are the leading pressure on sea lamprey in the freshwater and estuarine environment (Maitland, 2003; Jubb et al, 2023). Sea 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 sea 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 sea 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 sea 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).

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 spp. 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 sea 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 & 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 sea lamprey. The overall impact on sea 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	Measures are required are to address pressures identified in Section 8. The highest priority actions are to continue to

	improve habitat quality for sea 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 sea lamprey relate to the spawning and nursery habitats. Appropriate conservation measures such as habitat diversification to create the varied flows and microhabitats required should be implemented during river restoration projects and as good practice for river management during other infrastructure development / maintenance projects. 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. Silts should be oxic for burrowing larvae although they can survive anoxic conditions for short periods. 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.
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 sea lamprey in Wales.
9.5: List of main conservation measures	Measures are required are to address pressures identified in Section 8. The highest priority actions are to continue to improve habitat quality for sea 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 sea 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 sea lamprey is not expected to alter significantly in Wales in the next 12 years. Future prospects of population

	The population appears to be stable but this assessment is based on a very small evidence base comprising entirely of freshwater records. Although there are some potential threats to sea lamprey, there is insufficient evidence to estimate their overall importance and some factors suggest there could be an increase in population, therefore, an overall trend of stable is considered most appropriate.
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 not more than 25% below 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 poor; 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, juvenile and spawning sea 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 sea 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 sea 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. 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 FRP for Wales has been amended from unknown as the FRP has been calculated as around 550 1 x 1 km2 and the current population is 428 1 x 1 km2 . Therefore the operator of between 5% and 25% 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. This FRV was reviewed by Welsh experts and considered appropriate for use in Wales based on current distribution and trends.