European Community Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC)

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 the species:

S1099 - River lamprey (*Lampetra fluviatilis*)

UNITED KINGDOM

IMPORTANT NOTE - PLEASE READ

- The information in this document represents the UK Report on the conservation status of this species, submitted to the European Commission as part of the 2019 UK Reporting under Article 17 of the EU Habitats Directive.
- It is based on supporting information provided by the geographically-relevant Statutory Nature Conservation Bodies, which is documented separately.
- The 2019 Article 17 UK Approach document provides details on how this supporting information contributed to the UK Report and the fields that were completed for each parameter.
- The reporting fields and options used are aligned to those set out in the European Commission guidance.
- Maps showing the distribution and range of the species are included (where available).
- Explanatory notes (where provided) are included at the end. These provide additional audit trail information to that included within the UK assessments. Further underpinning explanatory notes are available in the related country-level 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 Natura 2000 coverage for Annex II species).
- The UK-level reporting information for all habitats and species is also available in spreadsheet format.

Visit the JNCC website, https://jncc.gov.uk/article17, for further information on UK Article 17 reporting.

Report on the main results of the surveillance under Article 11 for Annex II, IV and V species (Annex B)

NATIONAL LEVEL

1. General information

1.1 Member State	**UK**
1.2 Species code	**1099**
1.3 Species scientific name	**Lampetra fluviatilis**
1.4 Alternative species scientific name	
1.5 Common name (in national language)	River lamprey

2. Maps

2.1 Sensitive species	No
2.2 Year or period	1990-2018
2.3 Distribution map	Yes
2.4 Distribution map Method used	Based mainly on extrapolation from a limited amount of data
2.5 Additional maps	No

3. Information related to Annex V Species (Art. 14)

3.1 Is the species taken in the wild/exploited?	Yes	
3.2 Which of the measures in Art. 14 have been taken?	a) regulations regarding access to property	No
	b) temporary or local prohibition of 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
	h) other measures	No

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

a) Unit

b) Statistics/ quantity taken	Provide statistics/quantity per hunting season or per year (where season is not used) over the reporting period					
	Season/ year 1	Season/ year 2	Season/ year 3	Season/ year 4	Season/ year 5	Season/ year 6
Min. (raw, ie. not rounded)						
Max. (raw, ie. not rounded)						
Unknown	No	No	No	No	No	No

3.4. Hunting bag or quantity taken in the wild Method used

3.5. Additional information

Lamprey fisheries are subject to exploitation controls. There is currently only one licenced river lamprey fishery, in the Humber catchment in England. The primary legislation for the regulation of lamprey exploitation is the Salmon and Freshwater Fishery Act 1975 and the Marine and Coastal Access Act 2009. Under this legislation the Environment Agency has powers to licence netting/trapping of lamprey. Fishery byelaws regulate when, where and how fishing can take place. The licencing approach limits the number of licenced individuals, gear and effort. As part of this managed exploitation, pressure on the population can be controlled and data can be collected on lamprey stocks. There has been no exploitation in Scotland, Wales or Northern Ireland during the reporting period.

BIOGEOGRAPHICAL LEVEL

4. Biogeographical and marine regions

4.1 Biogeographical or marine region where the species occurs

Atlantic (ATL)

4.2 Sources of information

England
Addy, S., Cooksley, S., Dodd, N., Waylen, K., Stockan, J., Byg, A. & Holstead, K. 2016. River restoration and biodiversity: Nature based solutions for restoring rivers in the UK and Republic of Ireland. CREW ref. CRW2014/10
APEM 2005. Review of information on lamprey populations in the Humber basin. Report to the Environment Agency.
APEM 2014. A habitat survey for spawning ground and nursery areas for Annex II fish species within the Severn Estuary river catchment. APEM Scientific Report 413588. Natural England, January 2015, 45pp.
Bracken, F.S.A. & Lucas, M.C. 2013. Potential impacts of small-scale hydroelectric power generation on downstream moving lamprey. River research and applications. 29. 1073-1081.
Bracken, F.S.A., Hoelzel, A.R., Hume, J.B. & Lucas, M.C. 2015. Contrasting population genetic structure among freshwater-resident and anadromous lampreys: the role of demographic history, differential dispersal and

anthropogenic barriers to movement.
Common Standards Monitoring Guidance for Freshwater Fauna 2015
Common Standards Monitoring Guidance for Rivers 2014
Davies, C., Shelley, J., Harding, P., McLean, I., Gardiner, Ross & Peirson, G. 2004. Freshwater Fishes in Britain. The species and their distribution. Harley Books.
Environment Agency, 2013. Review of fish population data in the Humber Estuary.
Environment Agency, 2012. Summary of outcomes of the Review of Consents on water-related SACs. Excel spreadsheet.
Foulds, L.W. 2013. Anthropogenic factors affecting European river lamprey Lampetra fluviatilis in the Humber River basin, north-east England. PhD. Thesis, Durham University.
Foulds, L.W. & Lucas, M.C. 2013. Extreme inefficiency of two conventional technical fishways used by European river lamprey (Lampetra fluviatilis). Ecological Engineering, 58, 423-433.
Foulds, W.L. & Lucas, M.C. 2014. Paradoxical exploitation of protected fishes as bait for anglers: Evaluating the lamprey bait market in Europe and developing sustainable and ethical solutions. PLOS ONE, Vol. 9, Issue 6, e99617.
Findlay, J.D.S. 2013. Impacts of signal crayfish on stream fishes. Durham theses, Durham University.
Findlay, J.D.S., Riley, W.D. & M.C. Lucas. 2014. Signal crayfish (Pacifastacus leniusculus) predation upon Atlantic salmon (Salmo salar) eggs. Aquatic Conservation: Marine and Freshwater Ecosystems. 25. 250-258.
Guan, R-Z. & Wiles, P.R. 1996. Ecological Impact of Introduced Crayfish on Benthic Fishes in a British Lowland River. Conservation Biology, 11
Greaves, R.K., Bubb, D.H. & Lucas, M.C. 2007. Adult river lamprey occurrence and migration in the River Trent in relation to barriers and environmental conditions 2006-2007. Final report. University of Durham.
Habitats Regulations Assessment: Site Report for Hinkley Point. EN-6: Revised Draft National Policy Statement for Nuclear Power Generation. 2010. Department of Energy and Climate Change.
Hatton-Ellis, T. 2018. Procedure for Estimating Population (including Favourable Reference Population) using 1km Square Resolution Records Data. Interagency freshwater group. (Unpublished).
Holdich, D.M., James, J., Jackson, C. & Peay, S. 2014. The North American signal crayfish, with particular reference to its success as an invasive species in Great Britain. Ethology, Ecology & Evolution, 26, 232-262.
Jacklin, T.E. 2006. The status of lamprey species in the River Trent with particular regard to the Humber Estuary SAC. Environment Agency.
Langford, T.E., Worthington, T., Shaw, P., Kemp, P., Woolgar, C., Fergusson, A., Harding, P & Ottewell, D. 2012. The unnatural history of the River Trent: 50 years of ecological recovery. River Conservation and Management. Boon, J.P. & Raven, P.J. (Eds.). John Wiley & Sons, Ltd.
Mainstone, C.P., Dils, R.M. and Withers, P.J.A. 2008. Controlling sediment and phosphorus transfer to receiving waters - A strategic management perspective for England and Wales. Journal of Hydrology, 350, 131-143.
Mainstone, C.P. and Holmes, N.T. 2010. Embedding a strategic approach to river restoration in operational management processes - experiences in England. Aquatic Conservation: Marine and Freshwater Ecosystems. Published online in Wiley InterScience (www.interscience.wiley.com). DOI: 10.1002/aqc.1095
Mainstone, C., Hall, R. & Diak, I. 2016. A narrative for conserving freshwater and wetland habitats in England. Natural England Research Reports, Number 064.
Mainstone C.P. 2008. The role of specially designated wildlife sites in freshwater

conservation - an English perspective. Freshwater Reviews, 1, 89-98.
Mainstone, C. & Burn, A. 2011. Relationships between ecological objectives and associated decision-making under the Habitats and Water Framework Directives. Discussion paper, Natural England.
Mainstone, C.P. & Wheeldon, J. 2016. The physical restoration of English rivers with special designations for wildlife: from concepts to strategic planning and implementation. Freshwater Reviews. 8. Pg. 1 - 25.
Mainstone, C.P. 2016. Developing a coherent narrative for conserving freshwater and wetland habitats: experiences in the UK. WIRES Water, published Online: Nov 07 2016. DOI: 10.1002/wat2.1189.
Mainstone, C.P. 2018. Article 17 Habitats Pro-forma England H3260 for UK aggregation. Natural England
Mainstone, C.P. 2018. Analysis of Water Framework Directive data for use in Habitats Directive Article 17 reporting on Annex I river habitat (H3260) in England. Supplementary paper for the submission package to Europe, Natural England.
Maitland, P.S. 1980. Review of the ecology of lampreys in northern Europe. Canadian Journal of Fisheries and Aquatic Sciences. 37, 1944-1952.
Maitland, P.S. 2003. Ecology of the River, Brook and Sea Lamprey. Conserving Natura 2000 Rivers, Ecology Series No. 5. English Nature, Peterborough
Maria, I., Bernardo, J.M. & Fernandes, S. 2007. Predation of invasive crayfish on aquatic vertebrates: the effect of Procambarus clarkii on fish assemblages in Mediterranean temporary streams. Biological Invaders in Inland Waters. Gherardi, F. (ed.)
Masters, J.E.G., Jang, M.H., Ha, K., Bird, P.D., Frear, P.A. & Lucas, M.C. 2006. The commercial exploitation of a protected anadromous species, the river lamprey (Lampetra fluviatilis) in the River Ouse, north-east England. Aquatic Conserv: Mar. Freshw. Ecosyst. 16: 77-92.
Masters, J. 2016. Regulating commercial exploitation of river lamprey in the Humber tributaries - a review of methods and a proposal for future management. Environment Agency (unpublished).
Masters, J. EA River Lamprey catch returns pers. comm.
Natural England. 2015. River restoration theme plan. Output from the EU Life project 'Improvement Programme for England's Natura 2000 Sites' (IPENS). Natural England Report number IPENSTP023.
Noble, A.A., Bolland, J.P. & Cowx, I.G. 2013. Mark-recapture exploitation study on the river lamprey fishery of the Yorkshire Ouse. Final report. Hull International Fisheries Institute.
Nunn, A.D., Harvey, J.P., Noble, R.A.A. & Cowx, I.G 2008. Condition assessment of lamprey populations in the Yorkshire Ouse catchment, north-east England, and the potential influence of physical migration barriers. Aquatic Conservation: Marine and Freshwater Ecosystems 18: 175-189.
Nunn, A.D., Harvey, J.P., Noble, R.A.A. & Cowx, I.G. 2015. A desk-based study to consolidate existing data and literature to help inform the conservation status of Annex II features (migratory fish species) within the Severn Estuary river catchment. Natural England, IPENS programme LIFE11NAT/UK/000384IPENS.
O'Keeffe, N. Clough, S. & Cesar, C. 2011. Keadby Power Station fish entrainment study. APEM Scientific Report 410735
Peay, S., Guthrie, N., Spees, J., Nilsson, E. & Bradley, P. 2009. The impact of signal crayfish (Pacifastacus leniusculus) on the recruitment of salmonid fish in a headwater stream in Yorkshire, England. Knowledge and Management of Aquatic Ecosystems.
Reynolds, J.D. 2011. A review of ecological interactions between crayfish and

fish, indigenous and introduced. Knowledge and Management of Aquatic Ecosystems. 401, 10
Russon, I.G., Kemp, P.S. & Lucas, M.C. 2011. Guaging weirs impede the upstream migration of adult river lamprey Lampetra fluviatilis. Fisheries Management and Ecology. 18. 201-2010.
Survey of river lamprey ammocoetes and transformers in the Humber estuary SAC. Autumn 2013. Belflask Ecological Survey Team. Report produced for Natural England.
Tweed Estuary SAC / River Tweed SAC. Assessment of lamprey spawning habitat in the Till catchment in England. 2015. Report produced by The Tweed Foundation for Natural England.
Scotland
Bull C. 2003. Electro-fishing survey in selected tributaries of the River Teith candidate Special Area of Conservation. Unpublished Scottish Natural Heritage commissioned report.
Forth Fisheries Foundation. 2004. River and brook lamprey monitoring of the Endrick Water cSAC/SSSI. Scottish Natural Heritage Commissioned Report No. 057.
The Tweed Foundation. 2004. Assessment of lamprey distribution and abundance in the River Tweed cSAC/SSSI. Unpublished Scottish Natural Heritage commissioned report.
Watt J, Bull C, Ravenscroft, NOM, Seed M. 2011. Lamprey Survey of the Endrick Water SSSI/SAC 2008. Scottish Natural Heritage Commissioned Report No. 320.
Hume JB. 2011 Adult lamprey survey of the Endrick Water SSSI and SAC 2009-2010. Scottish Natural Heritage Commissioned Report No. 480.
Watt J, Brown L, Bull, C. Lamprey Site Condition Monitoring of the River Spey SSSI and SAC 2011. Unpublished Scottish Natural Heritage commissioned report.
Watt J, Bull C, Ravenscroft NOM. Site Condition Monitoring of lamprey in the River Tweed SSSI and SAC 2011. Unpublished Scottish Natural Heritage commissioned report.
Bull C, Perfect C, Watt J. 2016. Site condition monitoring of lamprey in the Endrick Water SSSI and SAC 2012. Scottish Natural Heritage Commissioned Report No. 911.
Bull C, Watt J. Site condition monitoring of lamprey in the River Teith SAC 2011. Unpublished Scottish Natural Heritage commissioned report.
Watt J, Bull C. Site Condition Monitoring of lamprey in the River Tay SAC 2012-2013. Unpublished Scottish Natural Heritage commissioned report.
IAFG. 2017. UK Article 17 reporting procedure for estimating population using 1 km square resolution records data. Inter-agency Freshwater Group, UK.
Records from the Atlas of Freshwater Fishes accessed through NBN Atlas website (https://registry.nbnatlas.org/public/show/dr741).
Selected Scottish freshwater fish records from 2008-2011 (collected by SEPA) accessed through the NBN Atlas website (https://registry.nbnatlas.org/public/show/dr442).
North East Scotland Fish Records 1800-2010 accessed through the NBN Atlas website (https://registry.nbnatlas.org/public/show/dr1230).
Marine Nature Conservation Review (MNCR) and associated benthic marine data held and managed by JNCC accessed through the NBN Atlas website (https://registry.nbnatlas.org/public/show/dr883).
NBN Atlas website at http://www.nbnatlas.org accessed 29 June 2018.
Wales
Angling Times. 2017. The best dead baits to use when angling for pike. Dead baiting is the number one pike tactic in the UK.

https://www.anglingtimes.co.uk/advice/bait/articles/the-best-deadbaits-to-use-when-pike-fishing [Accessed 10 April 2018]
Baxter E, McKenzie S, Jones C, Jones D. & Metcalfe P. 2017. Condition assessment using 2016 River Habitat Survey data and Common Standards Monitoring guidance for the Afon Teifi and Afon Eden - Cors Goch Trawsfynydd SACs. NRW Evidence Report No: 192, 92 pp. NRW, Bangor.
Blank M, Jurss K, Bastrop E. 2008. A mitochondrial multigene approach contributing to the systematics of the brook and river lampreys and the phylogenetic position of Eudontomyzon mariae. Canadian Journal of Fisheries and Aquatic Sciences. 65(12): 2780-279
Bracken FSA, Hoelzel AR, Hume JB, Lucas MC. 2015. Contrasting population genetic structure among freshwater-resident and anadromous lampreys: the role of demographic history, differential dispersal and anthropogenic barriers to movement. Molecular Ecology, 24: 1188-1204.
Campbell D, Williams E, APEM Aquatic Scientists. 2006. Lamprey Survey on the River Dee and Tributaries: Final Report - March 2006. Environment Agency Wales.
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.
Emmett BE & 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).
Espanhol R, Almeida P, Alves JM. 2007. Evolutionary history of lamprey paired species Lampetra fluviatilis (L.) and Lampetra planeri (Bloch) as inferred from mitochondrial DNA variation. Molecular Ecology,16. 1909-1924.
Gardiner R. 2003. Identifying Lamprey. Conserving Natura 2000 Rivers Techniques Series No. 4. Peterborough, English Nature.
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, Dolgellau: NRW.
Garrett, HM. 2016a. Afon Teifi SAC population attribute condition assessment for brook, river and sea lamprey population 2014. NRW Evidence Report No. 106. 28 pp. Bangor: NRW.
Garrett HM. 2016b. River Usk SAC habitat structure condition assessment using 2013 - 2015 RHS data & Common Standards Monitoring guidance. NRW Evidence Report No 142, 28, Dolgellau: NRW.
Garrett HM. 2017. SAC monitoring summary note. River Wye SAC lamprey species population condition assessment. Reporting cycle 2013 - 2018. Bangor: NRW.
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. Bangor: Countryside Council for Wales.
Garrett HM, 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, Thomas Rh. 2016. River Wye SAC habitat structure condition assessment using 2013 - 2015 RHS data & Common Standards Monitoring guidance. NRW Evidence Report No 141, 28pp. Dolgellau: NRW.
Hardisty M. 2006. Lampreys. Life without jaws. Pub. Forrest text.

Hatton-Ellis TW. 2017. Article 17: Management of Lampetra species records in the context of reporting range and population for brook lamprey / Lampetra fluviatilis and river lamprey / Lampetra planeri. NRW. Unpub. Bangor.
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.
IUCN. 2017. Lampetra fluviatilis / river lamprey. [http://www.iucnredlist.org/details/11206/0]. Accessed 19 June 2018.
Joint Nature Conservation Committee (JNCC). 2015. Common Standards Monitoring Guidance for Freshwater Fauna. Peterborough, Joint Nature Conservation Committee.
JNCC. 2007. Second Report by the UK under Article 17 on the implementation of the Habitats Directive from January 2001 to December 2006. Peterborough: JNCC. Available from: www.jncc.gov.uk/article17.
Lasalle, G. & 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.
Living with Environment Change (LWEC). 2011-2015. Climate change impact report cards. Available from: http://www.nerc.ac.uk/research/partnerships/lwec/products/report-cards/. Accessed January 2018.
Maitland PS, Morris KH, East K, Schoonoord MP, Van der Wal B, Potter IC. 1984. The estuarine biology of the river lamprey, Lampetra fluviatilis, in the Firth of Forth, Scotland, with particular reference to size composition and feeding. Journal of Fish Biology 203: 211-225.
Maitland PS. 2003. Ecology of the River, Brook and Sea Lamprey. Conserving Natura 2000 Rivers Ecology Series No. 5. English Nature, Peterborough.
MarLIN. 2018. European river lamprey (Lampetra fluviatilis). Available from: http://www.marlin.ac.uk/species/detail/49. Accessed 6 June 2018.
Mateus CS, Stange M, Berner D, Roesti M, Quintella BR, Alves MJ, Almeida PR, Salzburger W. 2013. Strong genome-wide divergence between sympatric European river and brook lampreys. Curr Biol. 23(15): R649-50.
Moss B. 2015. Biodiversity climate change impacts report card technical paper Freshwaters, climate change and UK conservation. Available from: https://nerc.ukri.org/research/partnerships/ride/lwec/report-cards/biodiversity-source17/
Natural England. 2001. The uplands management handbook. Pub. NE. Peterborough. Available from: http://publications.naturalengland.org.uk/publication/82050
Natural Resources Wales (NRW). 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: S1099 - River lamprey (Lampetra fluviatilis). Available from: http://jncc.defra.gov.uk/pdf/Article17Consult_20131010/S1099_UK.pdf.
Natural Resources Wales (NRW). 2015. Water Watch Wales maps gallery. Cycle 2 waterbodies and rivers. Available from: https://nrw.maps.arcgis.com/apps/webappviewer/index.html?id=2176397a06d64731af8b21fd69a143f6
Natural Resources Wales (NRW). 2017. National Fish Populations database held on BIOSYS. Accessed December 2017.
Natural Resources Wales (NRW). 2018. Natural Resources Wales business plan. Available from: https://naturalresources.wales/media/681430/business-plan-document-2017-18.pdf

Non-Native Species Secretariat GB. 2018a. Himalyan balsam (Impatiens glandulifera). Available from: http://www.nonnativespecies.org/index.cfm?pageid=147 Accessed 7/6/18
Non-Native Species Secretariat GB. 2018b. Japanese knotweed (Fallopia japonica). Available from: http://www.nonnativespecies.org/index.cfm?pageid=226 Accessed 7/6/18
Schreiber, A & Engelhorn S. 1998. Population genetics of a cyclostome species pair, river lamprey (Lampetra fluviatilis L.) and brook lamprey (Lampetra planeri Bloch). Journal of Zoological Systematics and Evolutionary Research, 36, Issue1-2, 85-99.
Teague N, Webb H, Allen V, Cesar CP, Thomas Rh, Hatton-Ellis TW. 2012. Lamprey monitoring on the River Dee special area of conservation SAC 2011. CCW Science Report No. 975. Bangor: Countryside Council for Wales (CCW).
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.
N.Ireland
Goodwin, C (2003). Ecology of three lamprey species in Northern Ireland.
Goodwin, C.E., Dick, J.T.A., Rogowski, D.L., Elwood, R.W. (2008). Lamprey ammocoete habitat association at regional, catchment and microhabitat scales in Northern Ireland. Ecology of Freshwater Fish. Blackwell Munksgaard: 17: 542-553.
Loughs Agency (2010). Lamprey Baseline Surveys: River Finn and River Deele Co Donegal. Loughs Agency of the Foyle Carlingford and Irish Lights Commission. Report Ref: LA/Lamprey/04&09/11. https://www.loughs-agency.org/wp-content/uploads/2015/05/lamprey-baseline-surveys-finn-and-deele-2010.pdf.
Maitland PS (2003). Ecology of the River, Brook and Sea Lamprey. Conserving Natura 2000 Rivers Ecology Series No. 5. English Nature, Peterborough.
Niven, A & McCauley (2013a). Lamprey baseline survey No. 2: River Faughan and Tributaries SAC. Loughs Agency, L'Derry.
Niven, A & McCauley (2013b). Lamprey baseline survey No. 3: River Foyle and Tributaries SAC. Loughs Agency, L'Derry.
Niven, A & McCauley (2013c). Lamprey baseline survey No. 4: River Roe and Tributaries SAC. Loughs Agency, L'Derry.
Inger, R., McDonald, R. A., Rogowski, D., Jackson, A.L., Parnell, A., Preston, S.J., Goodwin, C., Griffiths, D., Dick, J.T.A., Elwood, R.W., Newton, J., Bearhop, S. (2010). Do non-native invasive fish support elevated lamprey populations? Journal of Applied Ecology, 47, 121-129; https://besjournals.onlinelibrary.wiley.com/doi/epdf/10.1111/j.1365-2664.2009.01761.x.
Kurz, I and Costello, M.J. 1999 An outline of the biology, distribution and conservation of Lampreys in Ireland. Irish Wildlife Manuals No 5. Ducjas, Dublin.

5. Range

5.1 Surface area (km²)	60142.12	
5.2 Short-term trend Period	2007-2018	
5.3 Short-term trend Direction	Stable (0)	
5.4 Short-term trend Magnitude	a) Minimum	b) Maximum
5.5 Short-term trend Method used	Based mainly on extrapolation from a limited amount of data	
5.6 Long-term trend Period		

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5.7 Long-term trend Direction		
5.8 Long-term trend Magnitude	a) Minimum	b) Maximum
5.9 Long-term trend Method used		
5.10 Favourable reference range	a) Area (km²)	
	b) Operator	Approximately equal to (≈)
	c) Unknown	
	d) Method	The FRR has changed since 2013. An FRR operator has been used because it has not been possible to calculate the exact FRR. The FRR is considered to be sufficient to maintain a viable population and is no less that when the Habitats Directive came into force in the UK. For further details see the 2019 Article 17 UK Approach document.
5.11 Change and reason for change in surface area of range	Use of different method	
	The change is mainly due to:	
5.12 Additional information	The current range surface area calculation does not represent the real range surface area. Change in availability of underpinning mapping data has resulted in an apparent decrease in range area compared to 2013, but this is not due to genuine change. Expert opinion considers the trend in range to be stable. The real range surface area is considered to be the range in 2013 - 77,968km2. The FRR has been changed to an operator 'approximately equal to current' to reflect this. For further information see the 2019 Article 17 UK Approach document.	

6. Population

6.1 Year or period	1990-2018	
6.2 Population size (in reporting unit)	a) Unit	number of map 1x1 km grid cells (grids1x1)
	b) Minimum	
	c) Maximum	
	d) Best single value	1019
6.3 Type of estimate	Minimum	
6.4 Additional population size (using population unit other than reporting unit)	a) Unit	
	b) Minimum	
	c) Maximum	
	d) Best single value	
6.5 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	2006-2018	
6.8 Short-term trend Direction	Unknown (x)	
6.9 Short-term trend Magnitude	a) Minimum	
	b) Maximum	
	c) Confidence interval	

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6.10 Short-term trend Method used	Insufficient or no data available	
6.11 Long-term trend Period		
6.12 Long-term trend Direction		
6.13 Long-term trend Magnitude	a) Minimum b) Maximum c) Confidence interval	
6.14 Long-term trend Method used		
6.15 Favourable reference population (using the unit in 6.2 or 6.4)	a) Population size b) Operator c) Unknown d) Method	Approximately equal to (≈) The FRP has changed since 2013. An FRP operator has been used because it has not been possible to calculate the exact FRP. The FRP is considered to be large enough to maintain a viable population and is no less that when the Habitats Directive came into force in the UK. For further details see the 2019 Article 17 UK Approach document.
6.16 Change and reason for change in population size	Improved knowledge/more accurate data The change is mainly due to:	Improved knowledge/more accurate data
6.17 Additional information	There is insufficent data to complete a robust population assessment. This is because across the countries of the UK there is no systematic survey of river lamprey, and records are largely incidental. Assessment is further complicated by the highly similar morphology of river and brook lamprey which often precludes identification of lamprey to the species level.	

7. Habitat for the species

7.1 Sufficiency of area and quality of occupied habitat	a) Are area and quality of occupied habitat sufficient (for long-term survival)?	No
	b) Is there a sufficiently large area of unoccupied habitat of suitable quality (for long-term survival)?	Unknown
7.2 Sufficiency of area and quality of occupied habitat Method used	Based mainly on expert opinion with very limited data	
7.3 Short-term trend Period	2001-2018	
7.4 Short-term trend Direction	Unknown (x)	
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	River lamprey have complex habitat requirements and little is known about sufficiency of the habitat for the species. However, access restrictions (due to physical barriers) to historical river habitat combined with poor water quality are thought to have been responsible for the low numbers of river lamprey within	

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English rivers.

8. Main pressures and threats

8.1 Characterisation of pressures/threats

Pressure	Ranking
Agricultural activities generating point source pollution to surface or ground waters (A25)	M
Agricultural activities generating diffuse pollution to surface or ground waters (A26)	H
Hydropower (dams, weirs, run-off-the-river), including infrastructure (D02)	M
Discharge of urban waste water (excluding storm overflows and/or urban run-offs) generating pollution to surface or ground water (F12)	M
Mixed source pollution to surface and ground waters (limnic and terrestrial) (J01)	H
Drainage (K02)	M
Development and operation of dams (K03)	M
Modification of hydrological flow (K04)	M
Physical alteration of water bodies (K05)	M
Change of habitat location, size, and / or quality due to climate change (N05)	M

Threat	Ranking
Agricultural activities generating point source pollution to surface or ground waters (A25)	M
Agricultural activities generating diffuse pollution to surface or ground waters (A26)	M
Wind, wave and tidal power, including infrastructure (D01)	M
Hydropower (dams, weirs, run-off-the-river), including infrastructure (D02)	M
Discharge of urban waste water (excluding storm overflows and/or urban run-offs) generating pollution to surface or ground water (F12)	M
Mixed source pollution to surface and ground waters (limnic and terrestrial) (J01)	H
Development and operation of dams (K03)	M
Modification of hydrological flow (K04)	M
Physical alteration of water bodies (K05)	M
Change of habitat location, size, and / or quality due to climate change (N05)	M

8.2 Sources of information

8.3 Additional information

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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		Maintain the current range, population and/or habitat for the species
9.3 Location of the measures taken		Both inside and outside Natura 2000
9.4 Response to the measures		Medium-term results (within the next two reporting periods, 2019-2030)

9.5 List of main conservation measures

Manage the use of natural fertilisers and chemicals in agricultural (plant and animal) production (CA09)
Other measures related to agricultural practices (CA16)
Reduce impact of transport operation and infrastructure (CE01)
Reduce/eliminate point source pollution to surface or ground waters from industrial, commercial, residential and recreational areas and activities (CF04)
Manage changes in hydrological and coastal systems and regimes for construction and development (CF10)
Other measures related to residential, commercial, industrial and recreational infrastructures, operations and activities (CF12)
Reduce impact of other specific human actions (CH03)
Reduce impact of mixed source pollution (CJ01)
Reduce impact of multi-purpose hydrological changes (CJ02)
Restore habitats impacted by multi-purpose hydrological changes (CJ03)

9.6 Additional information

10. Future prospects

10.1 Future prospects of parameters	a) Range	Good
	b) Population	Good
	c) Habitat of the species	Unknown
10.2 Additional information		Future trend of Range is Overall stable; Future trend of Population is Overall stable; and Future trend of Habitat for the species is Overall stable. For further information on how future trends inform the Future Prospects conclusion see the 2019 Article 17 UK Approach document.

11. Conclusions

11.1. Range	Favourable (FV)
11.2. Population	Favourable (FV)
11.3. Habitat for the species	Unknown (XX)
11.4. Future prospects	Favourable (FV)
11.5 Overall assessment of Conservation Status	Favourable (FV)

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11.6 Overall trend in Conservation Status	Unknown (x)
11.7 Change and reasons for change in conservation status and conservation status trend	a) Overall assessment of conservation status Improved knowledge/more accurate data The change is mainly due to: Improved knowledge/more accurate data b) Overall trend in conservation status No information on nature of change The change is mainly due to:
11.8 Additional information	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. Conclusion on Population reached because: (i) the short-term trend direction in Population size is unknown; and (ii) the current Population size is approximately equal to the Favourable Reference Population. Conclusion on Habitat for the species reached because: (i) the area of habitat is unknown and (ii) the habitat quality is unknown for the long-term survival of the species; and (iii) the short-term trend in area of habitat is unknown. 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 unknown. Overall trend in Conservation Status is based on the combination of the short-term trends for Range - stable, Population - stable , and Habitat for the species - unknown. Overall assessment of Conservation Status has changed between 2013 and 2019 because the conclusion for Population has changed from Unfavourable-inadequate to Favourable, the conclusion for Habitat for the species has changed from Favourable to Unknown and the conclusion for Future Prospects has changed from Unfavourable-inadequate to Favourable. The Overall trend in Conservation Status has changed between 2013 and 2019 because the Population trend has changed from stable to unknown, the Habitat for the species trend has changed from stable to unknown. [note that the reason for change is due to less information/accuracy or certainty in the information available].

12. Natura 2000 (pSCIs, SCIs and SACs) coverage for Annex II species

12.1 Population size inside the pSCIs, SCIs and SACs network (on the biogeographical/marine level including all sites where the species is present)	a) Unit	number of map 1x1 km grid cells (grids1x1)
	b) Minimum	
	c) Maximum	
	d) Best single value	324
12.2 Type of estimate	Minimum	
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	Unknown (x)	

12.5 Short-term trend of population size within the network Method used	Insufficient or no data available
12.6 Additional information	

13. Complementary information

13.1 Justification of % thresholds for trends
13.2 Trans-boundary assessment
13.3 Other relevant Information

Distribution Map

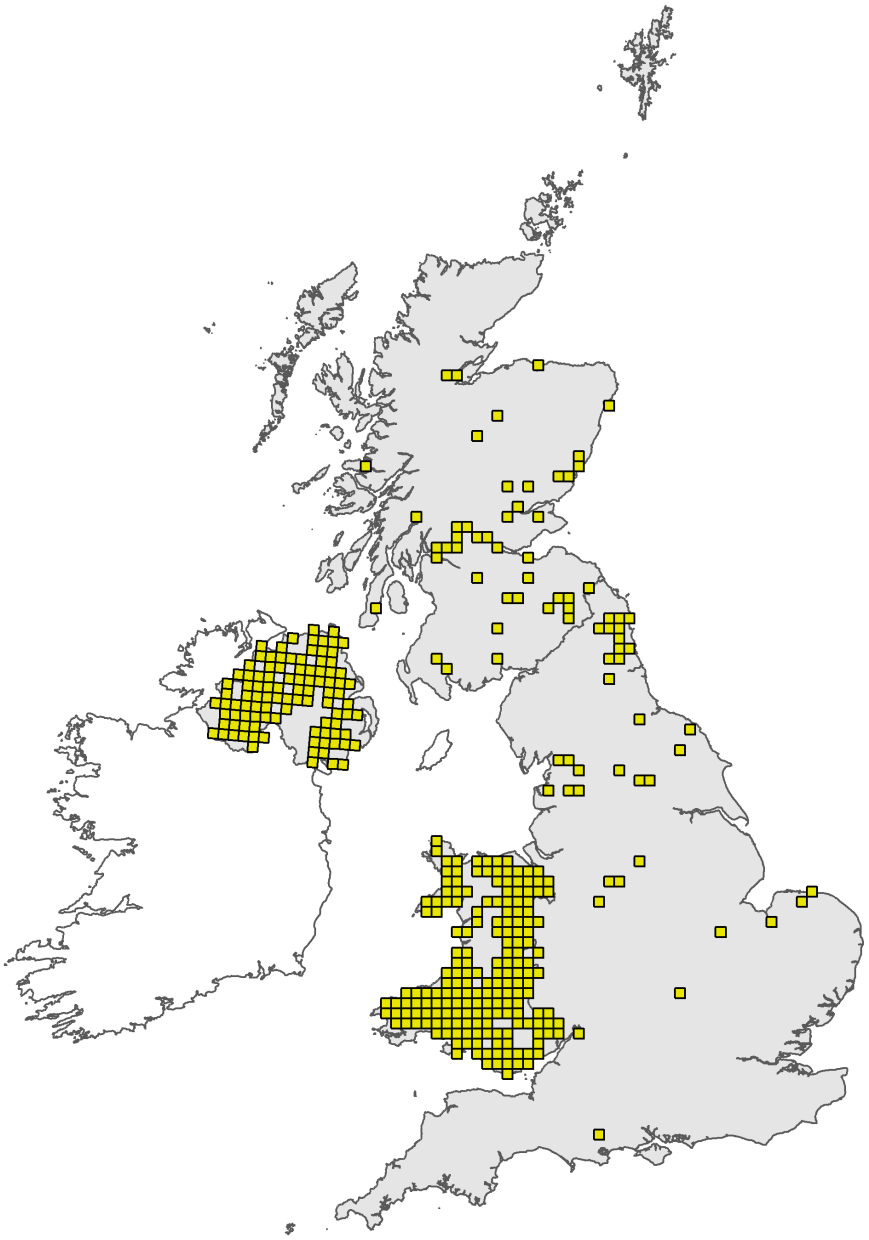

Figure 1: UK distribution map for S1099 - River lamprey (*Lampetra fluviatilis*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

The 10km grid square distribution map is based on available species records within the current reporting period. For further details see the 2019 Article 17 UK Approach document.

Range Map

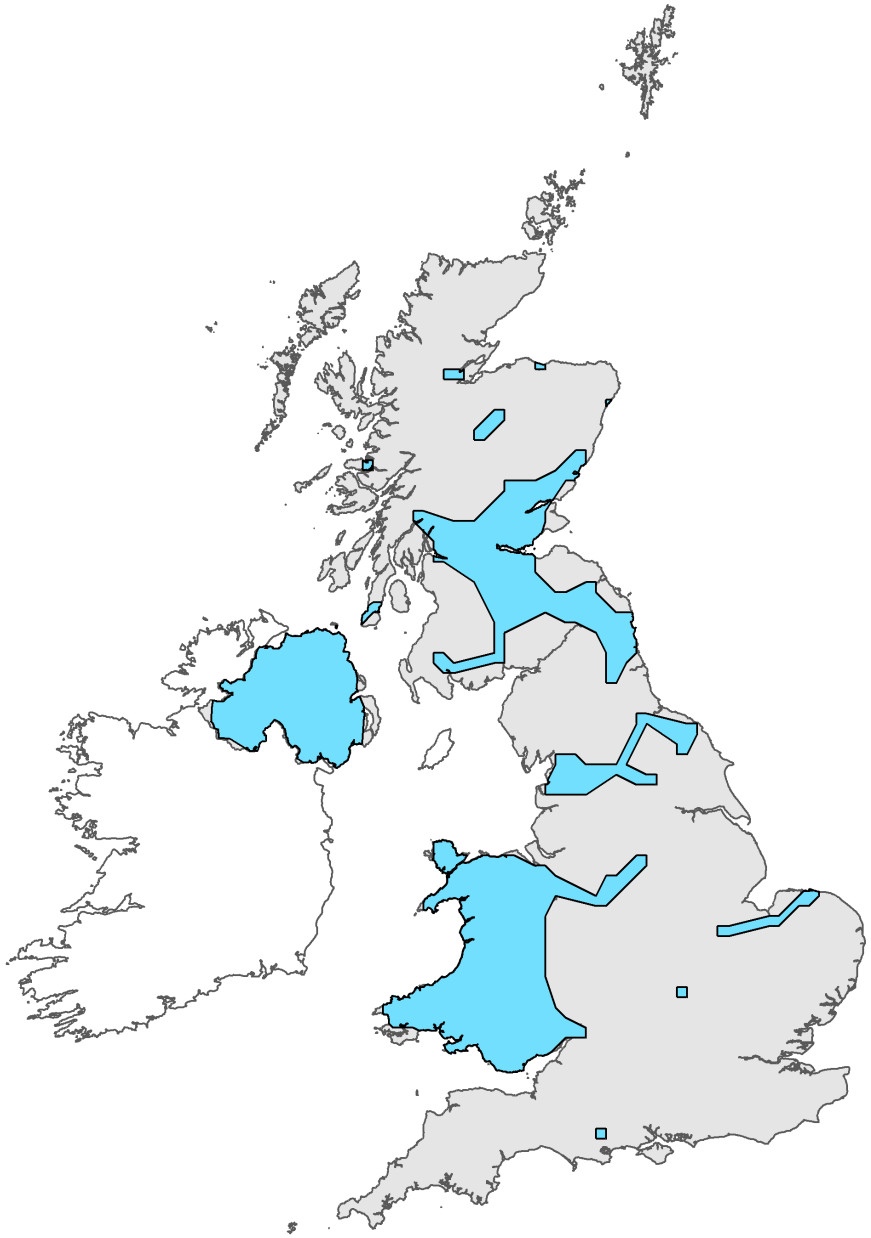

Figure 2: UK range map for S1099 - River lamprey (*Lampetra fluviatilis*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

The range map has been produced by applying a bespoke range mapping tool for Article 17 reporting (produced by JNCC) to the 10km grid square distribution map presented in Figure 1. The alpha value for this species was 25km. For further details see the 2019 Article 17 UK Approach document.