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

Supporting documentation for the
conservation status assessment for the species:

S1099 - River lamprey (*Lampetra fluviatilis*)

SCOTLAND

IMPORTANT NOTE - PLEASE READ

- The information in this document is a country-level contribution to 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.
- The 2019 Article 17 UK Approach document provides details on how this supporting information was used to produce the UK Report.
- The UK Report on the conservation status of this species is provided in a separate document.
- The reporting fields and options used are aligned to those set out in the European Commission guidance.
- Explanatory notes (where provided) by the country are included at the end. These provide an audit trail of relevant supporting information.
- 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; (iii) the field was not relevant to this species (section 12 Natura 2000 coverage for Annex II species) and/or (iv) the field was only relevant at UK-level (sections 9 Future prospects and 10 Conclusions).
- For technical reasons, the country-level future trends for Range, Population and Habitat for the species are only available in a separate spreadsheet that contains all the country-level supporting information.
- The country-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 (Scotland information only)**
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?	No	
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

BIOGEOGRAPHICAL LEVEL

4. Biogeographical and marine regions

4.1 Biogeographical or marine region where the species occurs

Atlantic (ATL)

4.2 Sources of information

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.

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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.

5. Range

5.1 Surface area (km²)		
5.2 Short-term trend Period		
5.3 Short-term trend Direction	Unknown (x)	
5.4 Short-term trend Magnitude	a) Minimum	b) Maximum
5.5 Short-term trend Method used		
5.6 Long-term trend Period		
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 c) Unknown d) Method	
5.11 Change and reason for change in surface area of range	Improved knowledge/more accurate data Use of different method The change is mainly due to:	Use of different method
5.12 Additional information		

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	656
6.3 Type of estimate	Minimum	

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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
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
6.16 Change and reason for change in population size	Improved knowledge/more accurate data Use of different method The change is mainly due to: Use of different method
6.17 Additional information	

7. Habitat for the species

7.1 Sufficiency of area and quality of occupied habitat	a) Are area and quality of occupied habitat sufficient (to maintain the species at FCS)?	Unknown
	b) Is there a sufficiently large area of occupied AND unoccupied habitat of suitable quality (to maintain the species at FCS)?	
7.2 Sufficiency of area and quality of occupied habitat Method used	Insufficient or no data available	
7.3 Short-term trend Period	2006-2018	
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		

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7.8 Long-term trend Method used

7.9 Additional information

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)	M
Forestry activities generating pollution to surface or ground waters (B23)	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
Modification of hydrological flow (K04)	H
Physical alteration of water bodies (K05)	H
Droughts and decreases in precipitation due to climate change (N02)	H
Change of habitat location, size, and / or quality due to climate change (N05)	H

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
Forestry activities generating pollution to surface or ground waters (B23)	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
Modification of hydrological flow (K04)	H
Physical alteration of water bodies (K05)	H
Droughts and decreases in precipitation due to climate change (N02)	H
Change of habitat location, size, and / or quality due to climate change (N05)	H

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		Long-term results (after 2030)

9.5 List of main conservation measures

Reduce/eliminate point pollution to surface or ground waters from agricultural activities (CA10)
Reduce diffuse pollution to surface or ground waters from agricultural activities (CA11)
Reduce diffuse pollution to surface or ground waters from forestry activities (CB10)
Reduce impact of hydropower operation and infrastructure (CC04)
Reduce/eliminate point source pollution to surface or ground waters from industrial, commercial, residential and recreational areas and activities (CF04)
Reduce/eliminate diffuse pollution to surface or ground waters from industrial, commercial, residential and recreational areas and activities (CF05)
Reduce impact of multi-purpose hydrological changes (CJ02)
Adopt climate change mitigation measures (CN01)
Implement climate change adaptation measures (CN02)

9.6 Additional information

10. Future prospects

10.1 Future prospects of parameters	a) Range b) Population c) Habitat of the species
10.2 Additional information	

11. Conclusions

11.1. Range	
11.2. Population	
11.3. Habitat for the species	
11.4. Future prospects	
11.5 Overall assessment of Conservation Status	
11.6 Overall trend in Conservation Status	
11.7 Change and reasons for change in conservation status and conservation status trend	a) Overall assessment of conservation status No change The change is mainly due to:

b) Overall trend in conservation status

No change

The change is mainly due to:

11.8 Additional information

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	377
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

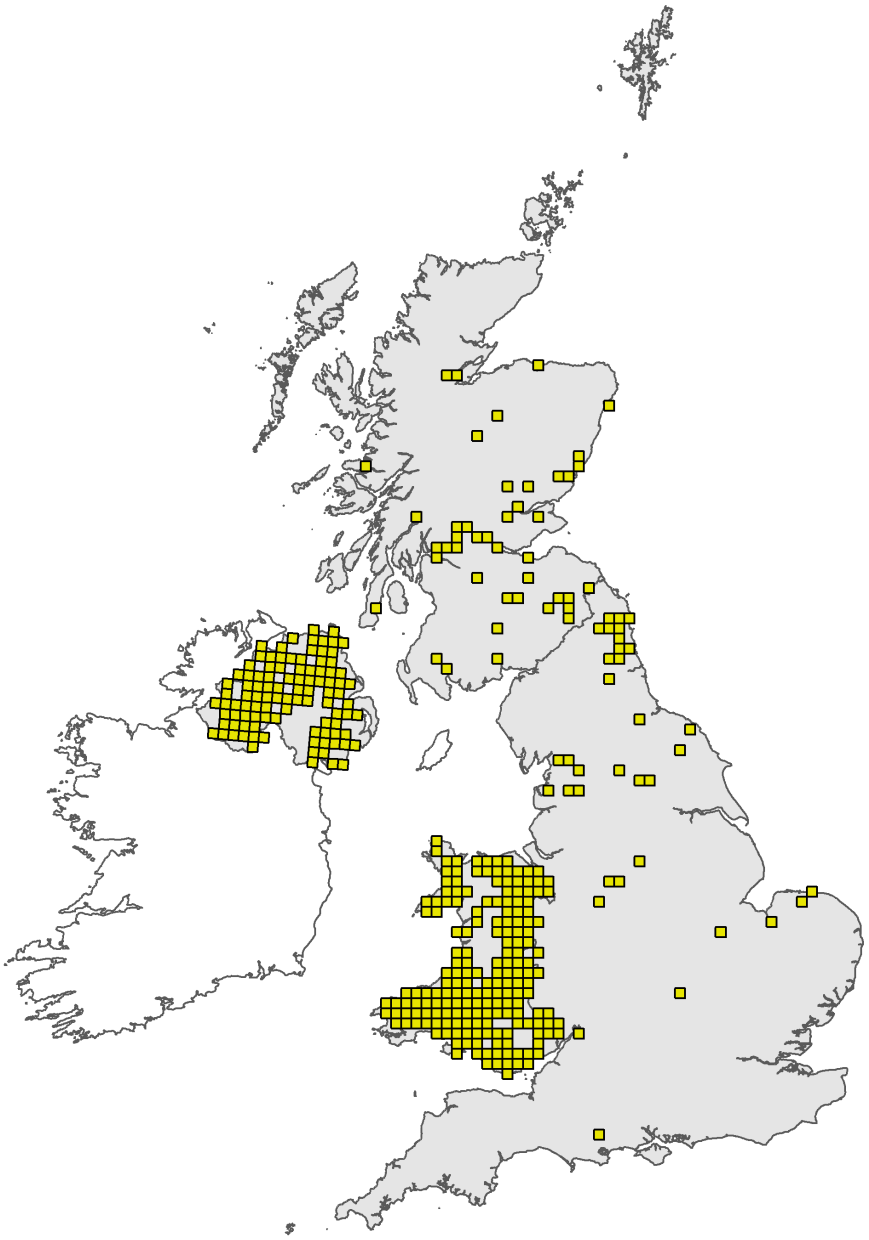

Figure 1: UK distribution map for S1099 - River lamprey (*Lampetra fluviatilis*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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

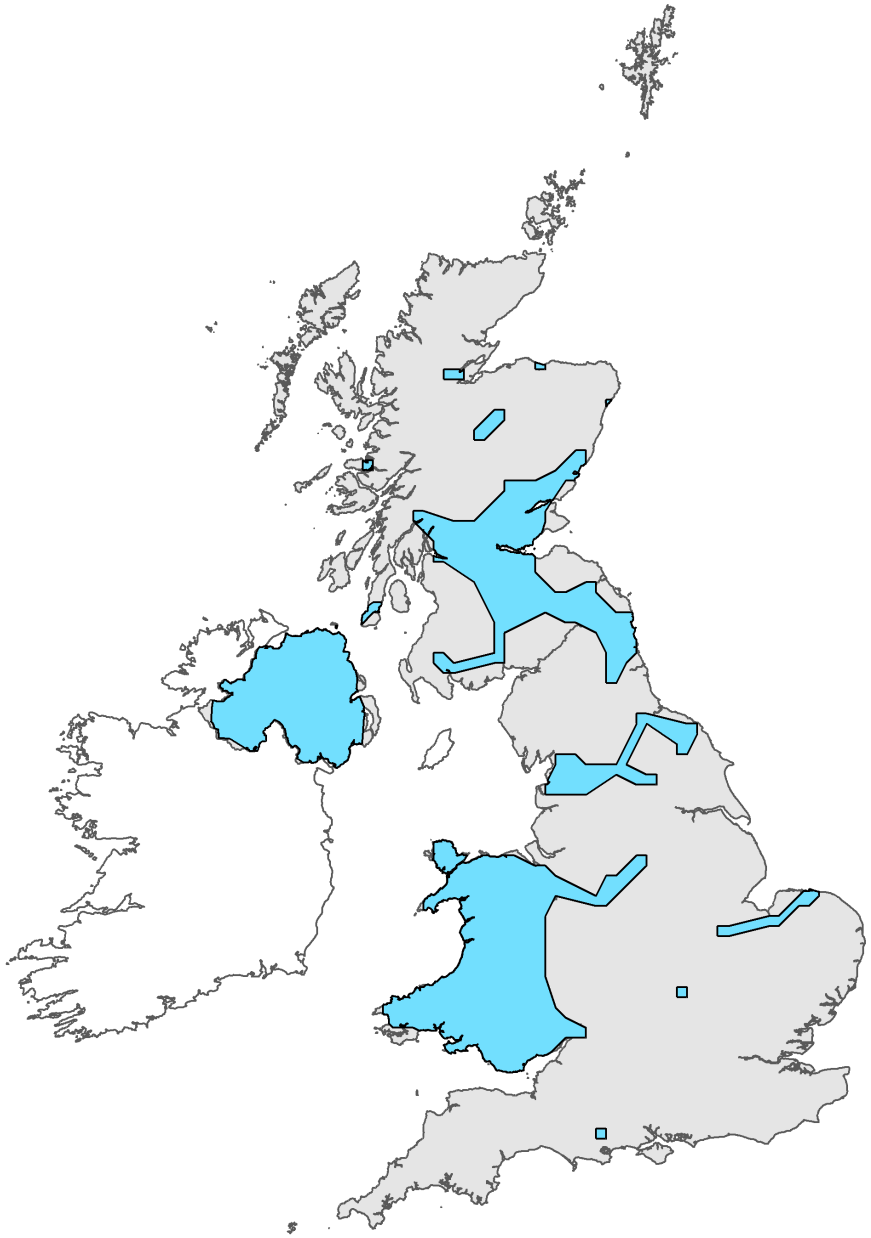

Figure 2: UK range map for S1099 - River lamprey (*Lampetra fluviatilis*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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.

Explanatory Notes

Species name: Lampetra fluviatilis (1099)

Field label	Note
2.2 Year or Period	Data gathered 2003-2012 have been used and extrapolated to 2018. Only one national survey has been undertaken during this period and the results of it are still thought to be relevant to the distribution assessment. Other records gathered throughout this period are also thought to be relevant to the distribution mapping.
2.4 Distribution map; Method used	The approach to mapping (see IAFG, 2017) is different to that used in 2013 when only actual records of the species were used to illustrate its distribution using occupied of 1 km x 1 km squares. The map produced for 2019 includes not only actual records for the species as occupied 1 km x 1 km squares but also those monads between the most upstream occupied square and the freshwater/marine interface irrespective of whether they include a record or not.

Species name: Lampetra fluviatilis (1099) Region code: ATL

Field label	Note
5.1 Surface area	The approach to mapping (see IAFG, 2017) is different to that used in 2013 when only actual records of the species were used to illustrate its range using occupied 1 km x 1 km squares. The map produced for 2019 includes not only actual records for the species as occupied 1 km x 1 km squares but also those monads between the most upstream occupied square and the freshwater/marine interface irrespective of whether they include a record or not.
5.3 Short term trend; Direction	Insufficient information is available to determine the short term trend in the range of the species. To date only one national survey has been undertaken. Site Condition Monitoring surveys tend to focus on approximately the same areas. Any difference in range is likely to be the result of better information and the use of a different mapping method (see IAFG, 2017) rather than actual change.
5.11 Change and reason for change in surface area of range	The approach to mapping (see IAFG, 2017) is different to that used in 2013 when only actual records of the species were used to illustrate the surface area of its range using occupied of 1 km x 1 km squares. The map produced for 2019 includes not only actual records for the species as occupied 1 km x 1 km squares but also those monads between the most upstream occupied square and the freshwater/marine interface irrespective of whether they include a record or not.
6.1 Year or Period	Data gathered 2003-2012 have been used and extrapolated to 2018. Only one national survey has been undertaken during this period and the results of it are still thought to be relevant to the distribution assessment. Other records gathered throughout this period are also thought to be relevant to the population assessment.
6.2 Population size	The approach to estimating the population size (see IAFG, 2017) is different to that used in 2013 when only actual records of occupied 1 km x 1 km squares were used. The estimate produced for 2019 includes not only actual records of 1 km x 1 km squares occupied by the species but also those monads between the most upstream and and the freshwater/marine interface irrespective of whether they include a record or not. The best single value for occupied wholly Scotland 1 km x 1 km squares is 656. In addition there are 38 occupied Scotland/England transboundary 1 km x 1 km squares.
6.8 Short term trend; Direction	Insufficient information is available to determine the short term trend in the population of the species. Any attempt to determine what the trend might be would be complicated by the transient nature of the species' habitat and interannual variation in the number of individuals.

6.16 Change and reason for change in population size	The change in population size reflects the new method (see IAFG, 2017) of mapping the species, i.e. actual records for the species as occupied 1 km x 1 km squares and the 1 km x 1 km squares between the most upstream records and the freshwater/marine interface, irrespective of whether they include a record or not, have been included. Assessments of the true population size would be unlikely to be meaningful due to the frequency of surveys, the transient nature of the species' habitat, and interannual variation in the number of individuals.
7.1 Sufficiency of area and quality of occupied habitat	Surveys focus on the larvae and historically the same technique has been applied to all three lamprey species. The number of Lampetra fluviatilis recorded during surveys is low and definite records are normally the result catching individuals that are transforming into adults or have recently done so; at this stage it is relatively easy to diferrentiate between the two Lampetra species by comparing their physical characteristics. Low numbers of L. fluvialtilis may be being caught for a variety of reasons including: they are naturally relatively scarce; they have different habitat preferences and their favoured habitat is not being adequately surveyed; and access to their habitat is hampered by engineered structures, e.g. weirs, dams. The sufficiency of area and quality of occupied habitat remains unknown.
8.1 Characterisation of pressures/ threats	Pressures arising from inadequate land management and pollution control and river engineering are likely to persist in the short to medium term. Regulation aimed at dealing with these issues exits and is evolving but there may be a lag in the biological response to improvements. The exact nature of the direct and indirect effects of climate change remain unknown. Pressures on the marine environment may affect river lamprey but insufficient is known about the adult phase.
9.1 Status of measures	The measures given in the 2013 report were some of those needed to ensure that river lamprey habitat was maintained or restored. However, non was undertaken specifically for river lamprey. The situation is the same for the current reporting period. The presumption is that the presence of good habitat is likely to result in healthy populations. Research undertaken in the intervening period suggests that not enough is known about the species to be able to specify its exact habitat requirements and so what, if anything, might be adversely affecting them. Meaningful habitat and population assessments are needed to identify species specific conservation measures. In order for these to be undertaken better information about the species including its life history is needed.
10.1 Future prospects of parameters	Reliable information about the range, population, and habitat of the species has yet to be established. Until it is it will not be possible to provide a meaningful prediction of the prospects for these parameters. Research into new lamprey survey and identification techniques (notably the use of eDNA) has been undertaken in recent years but further work is needed.
12.4 Short term trend of the population size within the network; Direction	Insufficient information is available to determine the short term trend in the population within the network. Any attempt to determine what the trend might be would be complicated by the transient nature of the species' habitat and interannual variation in the number of individuals.