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

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 - Brook lamprey (*Lampetra planeri*)

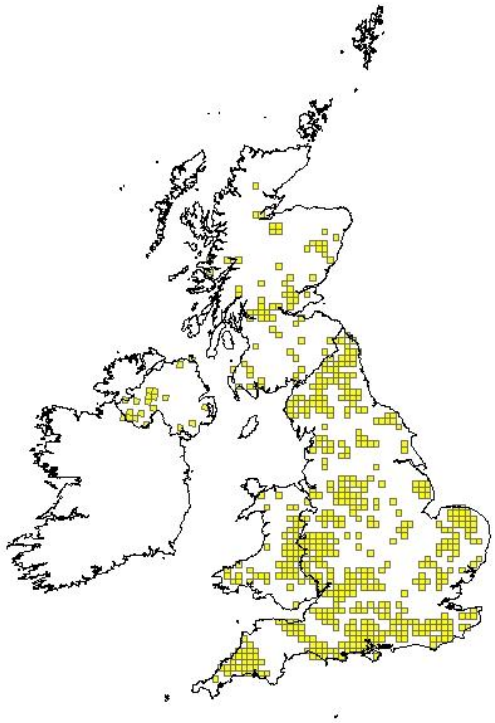
IMPORTANT NOTE – PLEASE READ

- The country-level reporting information contained in this document is a contribution to the Article 17 UK report for the habitat/species concerned.
- It has been provided by **Natural England** and refers only to the state of the habitat/species in **England** - it does not constitute an assessment for the whole of the UK.
- The Article 17 UK Approach document provides details on how this information has been used and, combined with information supplied by other Statutory Nature Conservation Bodies
- The format of the document is closely aligned to that set out by the European Commission for Member State reporting – as a result, some of the fields are not applicable at a country-level and have deliberately been left blank – in addition, the content of most fields is constrained by the EC reporting categories.

Reporting format on the 'main results of the surveillance under Article 11' for Annex II, IV & V species

Field name	*Brief explanations*	
0.2 Species	**0.2.1 Species code**	**S1096**
	0.2.2 Species scientific name	***Lampetra planeri***
	0.2.3 Alternative species scientific name Optional	
	0.2.4 Common name Optional	**Brook lamprey**

1.1 Maps			
1.1.1 Distribution map		**Sensitive**	**False**
	Brook lamprey is a widespread species, extending into the headwaters of catchments across England. The map is a fair reflection of its widespread nature, although some areas of the map are spuriously patchy (e.g. parts of south west England).		



1.1.2 Method used - map	**Estimate based on partial data with some extrapolation and/or modelling**
	Adult brook lamprey are often caught as part of general fishery and even benthic macroinvertebrate surveys and so the recording effort is relatively high, which is reflected in the high number of occupied grid cells. However, the patchiness of the map suggests that the species is not routinely recorded in routine surveys in all areas.

1.1.3 Year or period	**1990-2012**
1.1.4 Additional distribution map	**False**
1.1.5 Range map	

2.1 Biogeographical region & marine regions	**ATL**
2.2 Published sources	**"DAVIES, CE, SHELLEY, J, HARDING, PT, MCLEAN, IFG, GARDINER, R AND PEIRSON, G (eds.). 2004. Freshwater fishes in Britain. The species and their distribution. Harley Books, Colchester.** **HARVEY J AND COWX I. 2003. Monitoring the River, Brook and Sea Lamprey, Lampetra fluviatilis, L. planeri and Petromyzon marinus. Conserving Natura 2000 Rivers Monitoring Series No. 5, English Nature, Peterborough. Http://www.english-nature.org.uk/lifeinukrivers/publications/lamprey_monitoring.pdf** **MAITLAND, PS. 2003. Ecology of the River, Brook and Sea Lamprey. Conserving Natura 2000 Rivers, Ecology Series No. 5. English Nature, Peterborough. Http://www.english-nature.org.uk/LIFEinUKRivers/publications/lamprey.pdf** **APEM (1996) A survey of selected English rivers for lamprey 112 pp APEM Stockport Manchester UK** **APEM (1998) Lamprey survey of the River Nadder 21 pp APEM Stockport Manchester UK** **APEM (1997) Proposed Carlisle northern relief road: lamprey habitat survey and population survey 25 pp APEM Stockport Manchester UK** **APEM (1998) A survey of the western arm of the upper River Avon for lamprey. 17 pp English Nature, Peterborough** **APEM (1997) A survey of the upper River Avon for lamprey. 35 pp English Nature, Peterborough** **MAITLAND, PS. 1980. Review of the ecology of lampreys in northern Europe. Canadian Journalof Fisheries and Aquatic Sciences. 37, 1944-1952.** **Environment Agency (2012) Summary of outcomes of the Review of Consents on water-related SACs. Excel spreadsheet.** **Natural England (2012) England Catchment Sensitive Farming Initiative.**

	Http://www.naturalengland.org.uk/ourwork/farming/csf/default.aspx. **Wheeldon, J (2012) River Restoration Planning and implementation on River Sites of Special Scientific Interest in England. Internal Natural England paper.** **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.P. (2008) The role of specially designated wildlife sites in freshwater conservation – an English perspective. Freshwater Reviews, 1, 89-98.** **Chris Mainstone & Alastair Burn (2011) Relationships between ecological objectives and associated decision-making under the Habitats and Water Framework Directives. Discussion paper, Natural England.** **Mainstone, C.P. and Clarke, S.J. (2008) Managing multiple stressors on sites with special protection for freshwater wildlife – the concept of Limits of Liability. Freshwater Reviews, 1, 175-187."**

2.3 Range		
2.3.1 Surface area Range		
2.3.2 Method used Surface area of Range	**Estimate based on partial data with some extrapolation and/or modelling**	
2.3.3 Short-term trend Period	**2001-2012**	
2.3.4 Short term trend Trend direction	**stable**	
	Recording effort has increased considerably over the short-term trend period for range and it is likely that much of the apparent increase in range is due to increased recording effort. However, it is judged that range is at least stable over the short-term.	
2.3.5 Short-term trend Magnitude	**a) Minimum**	

	b) Maximum	
2.3.6 Long-term trend Period	**1989-2012**	
2.3.7 Long-term trend Trend direction	**stable**	
	Recording effort has increased considerably over the long-term trend period for range and it is likely that much of the apparent increase in range is due to increased recording effort. However, it is judged that range is at least stable over the long-term.	
2.3.8 Long-term trend Magnitude Optional	**a) Minimum**	
	b) Maximum	
2.3.9 Favourable reference range	**a) Value in km²**	
	b) Operator for FRR	**more than**
	c) FRR is unknown (indicated by "true")	**False**
	d) Method used to set FRR	**The current range can be taken as a minimum estimate of the favourable reference range. There is still some under-recording of the species that if resolved would extend the known range.**
2.3.10 Reason for change Is the difference between the reported value in 2.3.1 and the previous reporting round mainly due to…	**a) Genuine change?**	**False**
	b) Improved knowledge/more accurate data?	**True**

	c) Use of different method (e.g. "Range tool")?	**False**

2.4 Population		
2.4.1 Population size estimation (using individuals or agreed exceptions where possible)	**a) Unit**	
	b) Minimum	
	c) Maximum	
2.4.2 Population size estimation (using population unit other than individuals) Optional *(if 2.4.1 filled in)*	**a) Unit**	**number of map 1x1 km grid cells**
	b) Minimum	**1177**
	c) Maximum	
2.4.3 Additional information on population estimates / conversion Optional	**a) Definition of "locality"**	
	b) Method to convert data	
	c) Problems encountered to provide population size estimation	
2.4.4 Year or period	**1990-2012**	
2.4.5 Method used Population size	**Estimate based on partial data with some extrapolation and/or modelling**	
2.4.6 Short-term trend Period	**2001-2012**	
2.4.7 Short-term trend Trend direction	**unknown**	
	Population trend is unknown but probably at least stable over the short-term trend period.	

2.4.8 Short-term trend Magnitude	**a) Minimum**	
	b) Maximum	
	c) Confidence interval	
2.4.9 Short-term trend Method used	**Estimate based on expert opinion with no or minimal sampling**	
2.4.10 Long-term trend – Period	**1989-2012**	
2.4.11 Long-term trend Trend direction	**unknown**	
	Population trend is unknown but probably at least stable over the long-term trend period.	
2.4.12 Long-term trend Magnitude Optional	**a) Minimum**	
	b) Maximum	
	c) Confidence interval	
2.4.13 Long term trend Method used	**1**	
2.4.14 Favourable reference population	**a) Number of individuals/agreed exceptions/other units**	
	b) Operator	
	c) FRP is unknown indicated by	**True**

	"true"	
	It is not possible to estimate the reference population size using the chosen reference population unit (i.e. number of occupied 1km grid cells) with the information available. There is considerable under-recording of the species at 1km resolution, such that the reference population in these terms would expected to be far greater than the currently recorded estimate.	
	d) Method used to set FRP	
2.4.15 Reason for change Is the difference between the value reported at 2.4.1 or 2.4.2 and the previous reporting round mainly due to:	**a) Genuine change?**	**False**
	b) Improved knowledge/more accurate data?	**True**
	c) Use of different method (e.g. "Range tool")?	**False**

2.5 Habitat for the species		
2.5.1 Area estimation		
	It has not been possible to generate an estimate of habitat area. A simple habitat suitability model could potentially be generated based on the environmental characteristics of inhabitated sites, and then extrapolated to the wider river network. Suitable habitat is widespread in England, extending into the extensive headwater stream network, and therefore total habitat area would be expected to be very high.	
2.5.2 Year or period		
2.5.3 Method used Habitat for the species	**Absent data**	
2.5.4 Quality of the habitat	**a) Habitat quality**	**Moderate**
	Brook lamprey require coarse, well aerated substrates for spawning and egg incubation, aerobic silt beds in which ammocoetes can grow and mature, good water quality and unimpeded access to spawning beds. The English river network suffers from a range of impacts that interfere with the provision of these conditions. Although brook lamprey spawning migrations are short they can still be constrained by the many small weirs that cover the stream network in England. Loss or silting of coarse substrates, loss of physical habitat complexity leading to lack of silt beds for ammocoetes, and poor water quality are also major issues.	

	The Article 17 report on H3260 provides a reasonable basis for characterising habitat quality for brook lamprey, since H3260 is a widespread habitat in England and the natural range of brook lamprey is also wide. However, the H3260 report addresses general river habitat quality and is not specifically focused on the habitat quality required for brook lamprey. Key points from the H3260 report are provided below. Assessment of the condition of rivers designated SAC for H3260 (which is the majority of the SAC river network in England) is based on evaluation of the environmental integrity of the habitat (in relation to water quality, hydrology, morphology, non-native species and some aspects of the status of the characteristic biological community. By habitat area, around 11% is recorded as favourable, 45% as Unfavourable recovering, and 43% as Unfavourable no change. There are typically multiple reasons for Unfavourable condition, which need to be addressed in a coordinated way to move SACs to Unfavourable recovering and ultimately Favourable condition. The large percentage of area recorded as Unfavourable recovering reflects the complex planning and length timescales needed to resolved many of the key pressures on river systems. Within the wider network of nationally designated (SSSI) rivers designated for their river habitat, some 42% is recorded as Favourable, 33.5% as Unfavourable recovering, and 21% as Unfavourable no change. The higher proportion of area in Favourable condition relative to SACs is likely to be an artefact of the data, partly due to the inclusion of adjacent floodplain habitat in the figures which is often recorded as being in Favourable condition even though the adjacent river channel and its banks are not. Beyond SACs and nationally designated sites, the main source of data on habitat condition is the Water Framework Directive (WFD). The WFD reports on the ecological status of rivers that form part of defined 'waterbodies'. Ecological status is defined in terms of a number of biological quality elements: the phytobenthos (algae and submerged higher plants), macroinvertebrates and fish, as well as the nutrient status of waterbodies. A number of environmental standards are also defined that support ecological status. Status categories are high, good, moderate, poor and bad. Where significant anthropogenic modifications are present in a waterbody, which cannot be removed to restore good ecological status, the waterbody is designated as heavily modified under the WFD and an objective is assigned in terms of ecological potential. There is no simple relationship between favourable condition of SAC/SSSI river habitat and ecological status classes. However, for most biological and environmental indicators that both assessment methods use, favourable condition is most closely associated with high ecological status. See Mainstone and Burn, (2011) in 2.2 for further explanation. Levels of habitat condition consistent with ecological potential objectives are set in relation to site-specific constraints and cost-benefit considerations and are not amenable to general comparison with favourable condition as defined for SACs and SSSIs.

	Mainstone (2011) provides summary statistics of WFD ecological status data across the English river network. About a third (30.3%) of all WFD river waterbodies in England have been designated as heavily modified and therefore have objectives relating to ecological potential rather than ecological status. Of those waterbodies not designated as heavily modified, around 70% were at less than ges in the 2009 WFD baseline assessment, and only 4 waterbodies were at hes. This assessment is based on the worst performing quality element making up the assessment (biological quality elements and nutrient levels).	
	b) Assessment method	**Condition assessment of SAC rivers, wider assessment of ecological status under the Water Framework Directive. See Article 17 report on H3260.**
2.5.5 Short-term trend Period	**2001-2012**	
2.5.6 Short-term trend Trend direction	**increase**	
	Progress has been made with reducing nutrient and organic pollution levels in many rivers across England within the short-term trend period, which should have a beneficial effect on the quality of spawning and ammocoete substrates. However, progress with tackling siltation of spawning beds, physical barriers to migration and physical habitat degradation are still in their early stages.	
2.5.7 Long-term trend Period	**1989-2012**	
2.5.8 Long-term trend Trend direction	**increase**	
	Progress has been made with reducing nutrient and organic pollution levels in many rivers across England within the long-term trend period, which should have a beneficial effect on the quality of spawning and ammocoete substrates. However, progress with tackling siltation of spawning beds, physical barriers to migration and physical habitat degradation are still in their early stages.	
2.5.9 Area of suitable habitat for the species	**a) Value in km²**	
	It has not been possible to generate an estimate of suitable habitat area.	
	b) Absence of data indicated as '0'	
2.5.10 Reason for change Is the difference between the value reported at 2.5.1 and the previous reporting round mainly due to	**a) Genuine change?**	**False**
	b) Improved knowledge/more accurate data?	**False**

	c) Use of different method (e.g. "Range tool")?	**False**

2.6 Main pressures		
a) Pressure	**b) Ranking**	**c) Pollution qualifier**
	H = high importance M = medium importance L = low importance	
H01: Pollution to surface waters (limnic & terrestrial, marine & brackish)	H	X
J02: human induced changes in hydraulic conditions	H	
J03: Other ecosystem modifications	H	

H01 - Pollution sources include nutrients and organic pollution from domestic sources, nutrients and fine sediment from agriculture, and industrial pollution. However, pollution from domestic and industrial sources is declining as measures are progressively taken. Major initiatives on agricultural pollution should generate reduced diffuse pollution loads.

J02 - Artificial modifications to river channels and flow regimes can affect hydraulic conditions in ways that increase siltation of spawning gravels, reduce the extent and quality of ammocoete beds and interfere with spawning migrations. Such modifications are extensive in England.

J03 - Artificial physical barriers obstruct migration routes in many river systems. This can result in impaired access or complete obstruction. There are many small weirs in the headwater stream network that is the core habitat for brook lamprey.

2.6.1 Method used – Pressures	**based exclusively or to a larger extent on real data from sites/occurrences or other data sources**

2.7 Threats		
a) Threat	**b) Ranking**	**c) Pollution qualifier**
	H = high importance M = medium importance L = low importance	
H01: Pollution to surface waters (limnic & terrestrial, marine & brackish)	H	X
J02: human induced changes in hydraulic conditions	H	
J03: Other ecosystem	H	

modifications		
M01: Changes in abiotic conditions	H	

All of the pressures listed in 2.6 are set to continue into the future, although on-going or planned action on some of them should lessen their impact. In addition, climate change is likely to increase the frequency of extremes in flow regimes, which may affect spawning migrations and the suitability and extent of spawning and ammocoete beds. Headwater streams are the principal habitat for brook lamprey and these are particularly susceptible to drought conditions, which are likely to become more prevalent in a changing climate.	
2.7.1 Method used – Threats	**expert opinion**

2.8 Complementary information	
2.8.1 Justification of % thresholds for trends	
2.8.2 Other relevant information	
2.8.3 Trans-boundary assessment	

2.9 Conclusions *(assessment of conservation status at end of reporting period)*
Please refer to the United Kingdom assessment for this species.

3 Natura 2000 coverage & conservation measures - Annex II species
(only applies to species listed under Annex II of the Directive)

3.1 Population		
3.1.1 Population size Estimation of population size included in the SAC network	**a) Unit**	**number of map 1x1 km grid cells**
	Brook lamprey is a widespread species in England and the SAC river network can only provide representative coverage of the species across its natural range.	
	b) Minimum	**209**

	Only a minimum estimate can be provided due to the level of under-recording at 1km square resolution. It is likely that the real population size within SACs using this unit is substantially greater.
	c) Maximum
	No maximum estimate is available.
3.1.2 Method used	**Estimate based on partial data with some extrapolation and/or modelling**
3.1.3 Trend of population size within the network (short-term trend)	**stable**
	Given its widespread occurrence in the SAC river network and the improving trend in habitat quality, it is likely that the species is at least stable.

3.2 Conservation measures

Conservation measures taken (i.e. already being implemented) within the reporting period and provided information about their importance, location and evaluation.

3.2.1 Measure	**3.2.2 Type**					**3.2.3 Ranking** H = high importance M = medium importance L = low importance	**3.2.4 Location** where the measure is PRIMARILY applied			**3.2.5 Broad evaluation of the measure**					
	a) Legal/statutory	**b) Administrative**	**c) Contractual**	**d) Recurrent**	**e) One-off**		**a) Inside**	**b) Outside**	**c) Both inside & outside**	**a) Maintain**	**b) Enhance**	**c) Long term**	**d) No effect**	**e) Unknown**	**f) Not evaluated**
4.0: Other wetland-related measures	Y	Y	Y	Y	Y	H	Y				Y	Y			
4.1: Restoring/improving water quality	Y	Y	Y	Y		H			Y		Y	Y			
4.2: Restoring/improving the hydrological regime	Y				Y	H	Y				Y				
4.3: Managing water abstraction	Y				Y	H	Y				Y				

Within the English river SAC network, and to a lesser extent the wider network of nationally designated rivers, considerable effort has been expended on the development and implementation of strategic plans aimed at restoring the condition of the river habitat (see Mainstone and Clarke 2008 in 2.2 for an explanation of the strategy adopted). Beyond the designated site network, management measures for restoring river habitat are largely governed by the Water Framework Directive. Within the first round of river basin management planning, a considerable amount of WFD-related effort is being expended on confirming, and investigating the causes of problems with, ecological status. Better harmonisation of plans and activities under the WFD and Habitats Directive is needed (see Mainstone 2008 in 2.2 for further discussion of harmonisation issues).

An account of each type of conservation measure is given below.

4.0 Since the last Article 17 report, a major programme of physical restoration has been implemented on the SAC and domestic SSSI river network, involving the development of a long-term strategic plan for each river and its programmed implementation over suitable timescales (see references in 2.2 for details of the programme). These plans address key issues such as dams and weirs, channelisation, flood embankments, bank reinforcements, lack of riparian habitat, lack of riparian trees and lack of woody debris in the channel. The development and implenmentation of these plans is providing an important strategic focus for river restoration on the designated river network, and is valuable in promoting a strategic approach on the wider river network. Outside of the designated site network, practical measures have focused on addressing the many weirs and dams on the river network in England. The general WFD aim is to remove problem structures where possible, or to reduce their impacts on fish migration.

4.1 Work has continued to implement the review of discharge consents affecting the Natura network in England. Further phosphorus removal processes have been fitted to sewage effluents under the water industry's programme of strategic improvements. In respect of discharge consents affecting river SACs, 108 are being modified, 7 are being revoked and one is being surrendered. However, further investigations are needed into the application of new best available technology for phosphorus removal, as well as the need for action on rural unsewered populations. Plans are being drawn up for addressing these issues in relation to SACs and nationally designated sites.

In relation to agricultural pollution, the England Catchment Sensitive Farming Initiative is continuing to promote a range of best agricultural practices to reduce pollution loads to priority aquatic sites, including a range of river SACs and nationally designated rivers (see link in 2.2 for further details). The initiative is voluntary and uses awareness-raising and incentives to bring about management change. Modelling has predicted benefits in terms of reduced pollution loads, but it is still unclear how far a voluntary approach will go towards achieving favourable conditions for the habitat.

4.2/4.3 The review of abstraction licences affecting the Natura network in England has been completed. In respect of those licences affecting river SACs, 10 are being served closure notices, 111 are being modified, 15 are being revoked and 9 are being surrendered. However, agreement is needed on further action on abstraction to ensure that the flow regime of SAC rivers and other nationally designated rivers are properly protected.