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:

S1109 - Grayling (*Thymallus thymallus*)

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.

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NATIONAL LEVEL	

1. General information

1.1 Member State	**UK**
1.2 Species code	**1109**
1.3 Species scientific name	**Thymallus thymallus**
1.4 Alternative species scientific name	
1.5 Common name (in national language)	Grayling

2. Maps

2.1 Sensitive species	No
2.2 Year or period	1998-2018
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	Yes
	b) temporary or local prohibition of the taking of specimens in the wild and exploitation	Yes
	c) regulation of the periods and/or methods of taking specimens	Yes
	d) application of hunting and fishing rules which take account of the conservation of such populations	Yes
	e) establishment of a system of licences for taking specimens or of quotas	Yes
	f) regulation of the purchase, sale, offering for sale, keeping for sale or transport for sale of specimens	Yes
	g) breeding in captivity of animal species as well as artificial propagation of plant species	Yes
	h) other measures	Yes

England
Grayling in all English rivers are subject to controls on angling activity. The primary legislation for the regulation of angling is the 'Salmon and Freshwater Fishery Act 1975'. Under this legislation the Environment Agency has powers to licence recreational angling. Fishery byelaws regulate when, where and how angling can take place. The licencing approach records the number of licenced individuals and regulates the gear and effort used. As part of this managed exploitation, pressure on the population can be controlled and data can be collected on grayling stocks. The taking of grayling from English waters is specifically cited within the regulations and there is a limit of 2 grayling (30cm to 38cm) imposed. In addition to the Salmon and Freshwater Fishery Act, the

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stocking of fish to freshwaters is regulated by 'The Keeping and Introduction of Fish (England and River Esk Catchment Area) Regulations 2015'.

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

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
Wales
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Dawnay N, Dawnay L, Hughes RN, Cove R, Taylor MI. 2011. Substantial genetic structure among stocked and native populations of the European grayling (Thymallus thymallus, Salmonidae) in the United Kingdom. Conservation Genetics. DOI: 10.1007/s10592-010-0179-4
Grayling Society. 2018. The Grayling Society 'About Grayling'. Available from: http://www.graylingsociety.net/grayling-research-trust (Accessed 26th March 2018).
Duigan C, Monteith DT, Carvalho L, Bennion H, Hutchinson J, Seda JM, Evans F. 2003 The current ecological and conservation status of Llyn Tegid. In: Llyn Tegid Symposium: The ecology, conservation and environmental history of the largest natural lake in Wales. Eds. Duigan C, Gritten R, Millband H). University of Liverpool, Liverpool.
Huet M. 1959. Profiles and biology of Western European streams as related to fish management. Transactions of the American Fisheries Society 88:155-163.

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Ibbotson AT, Cove RJ, Ingraham A, Gallagher M, Hornby DD, Furse M, Williams C. 2001. A review of grayling ecology: status and management practice. R&D Technical Report W245. Environment Agency, Bristol.

IAFG. 2018. Procedure for Estimating Population (including Favourable Reference Population) using 1km Square Resolution Records Data. Interagency Freshwater Group.

Johnson HF. 2011. Population Dynamics of the European Grayling, Thymallus thymallus in the River Dee, North Wales. MSc Thesis, School of Biological Sciences, Bangor University.

Leah RT. 2003 A Review of the Ecology of Fish Populations of Llyn Tegid, with special emphasis on the Gwyniad. In: Llyn Tegid Symposium: The ecology, conservation and environmental history of the largest natural lake in Wales. Eds. Duigan C, Gritten R, Millband H). University of Liverpool, Liverpool.

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Woolland JV, Jones JW. 1975. Studies on grayling Thymallus thymallus in Llyn Tegid and the upper River Dee, North Wales. Part 1. Age and growth. Journal of Fish Biology 7:749-773.

WTT. 2018. Grayling & Trout (online). The Wild Trout Trust. Available from: http://www.wildtrout.org/content/grayling-trout (Accessed 26th March 2018).

Bathers K. 2018. Dee catch returns from Hanak International Grayling Festival. Unpublished catch data. River Dee.

Cove RJ. 2018. Information on grayling distribution on the River Dee. Unpublished personal communication. Natural Resources Wales.

WUF 2018. Wye and Usk Foundation catch returns (online). Available from: https://www.fishingpassport.co.uk/catch-return (Accessed 26th January 2018).

NRW 2018. Dee Stock Assessment Programme. Natural Resources Wales.

NRW 2017. National Fisheries Populations Database. Natural Resources Wales.

NBN 2018. Database for the Atlas of Freshwater Fishes (online). Available from: https://nbn.org.uk/ (Accessed 26th January 2018). NBN 2018. Welsh Invertebrate Database (online). Available from: https://nbn.org.uk/ (Accessed 26th January 2018).

WUF 2018. Wye and Usk Foundation 'River Work'. Available from: https://www.wyeuskfoundation.org/Pages/Category/river-work. Accessed 8th May 2018.

5. Range

5.1 Surface area (km²)	50471.61	
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		
5.7 Long-term trend Direction		
5.8 Long-term trend Magnitude	a) Minimum	b) Maximum

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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 is approximately equal to the current range. An FRR operator has been used because it has not been possible to calculate the exact FRR. For further details please 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:	Use of different method
5.12 Additional information	The current Range surface area calculation does not represent the real range surface area, which is considered to be the range in 2013 - 50471.61km2. Change in availability of underpinning mapping data compared to 2013 has resulted in an apparent decrease in range area, but this is not genuine change. Expert opinion considers the trend to be stable. For further information see the 2019 Article 17 UK Approach document.	

6. Population

6.1 Year or period	1988-2018	
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	308
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	2007-2018	
6.8 Short-term trend Direction	Stable (0)	
6.9 Short-term trend Magnitude	a) Minimum	
	b) Maximum	
	c) Confidence interval	
6.10 Short-term trend Method used	Based mainly on expert opinion with very limited data	
6.11 Long-term trend Period	1988-2018	
6.12 Long-term trend Direction	Stable (0)	

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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	Approximately equal to (≈)
	c) Unknown	
	d) Method	The FRR is the same as in 2013 and is approximately equal to the current population. An FRP operator has been used because it has not been possible to calculate the exact FRP. The current population is considered 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.

| 6.16 Change and reason for change in population size | No change |
| | The change is mainly due to: |

| 6.17 Additional information | Expert opinion concluded that the operator set in 2013 'approximately equal to' remains appropriate despite the change in units from 10x10km2 in 2013 to 1x1km2 in 2019. |

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)? | No |

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	2007-2018
7.4 Short-term trend Direction	Stable (0)
7.5 Short-term trend Method used	Based mainly on extrapolation from a limited amount of data
7.6 Long-term trend Period	
7.7 Long-term trend Direction	
7.8 Long-term trend Method used	
7.9 Additional information	Habitat sufficiency for grayling remains compromised by several factors, including physical barriers to migration, interspecific competition with other rheophylic fish (i.e. species with a preference for living in flowing water) and non-native crayfish, and continued poor water quality.

8. Main pressures and threats

8.1 Characterisation of pressures/threats

Pressure   Ranking

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Hydropower (dams, weirs, run-off-the-river), including infrastructure (D02)	M
Management of fishing stocks and game (G08)	M
Invasive alien species of Union concern (I01)	M
Problematic native species (I04)	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)	H
Temperature changes (e.g. rise of temperature & extremes) due to climate change (N01)	M

Threat	Ranking
Hydropower (dams, weirs, run-off-the-river), including infrastructure (D02)	M
Management of fishing stocks and game (G08)	M
Invasive alien species of Union concern (I01)	H
Problematic native species (I04)	M
Mixed source pollution to surface and ground waters (limnic and terrestrial) (J01)	H
Modification of hydrological flow (K04)	H
Physical alteration of water bodies (K05)	H
Temperature changes (e.g. rise of temperature & extremes) due to climate change (N01)	M
Other climate related changes in abiotic conditions (N09)	M

8.2 Sources of information

8.3 Additional information

9. Conservation measures

9.1 Status of measures	a) Are measures needed?	No
	b) Indicate the status of measures	

9.2 Main purpose of the measures taken

9.3 Location of the measures taken

9.4 Response to the measures

9.5 List of main conservation measures

9.6 Additional information

10. Future prospects

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10.1 Future prospects of parameters	a) Range	Good
	b) Population	Good
	c) Habitat of the species	Poor
10.2 Additional information	Future trend of Range is Positive - increasing <=1% (one percent or less) per year on average; Future trend of Population is Positive - increasing <=1% (one percent or less) per year on average; and Future trend of Habitat for the species is Positive- slight/moderate improvement. 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	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 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 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 stable; 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 occupied and unoccupied habitat is not sufficiently large and (ii) the habitat quality is not adequatefor the long-term survival of the species; and (iii) the short-term trend in area of habitat is stable. Conclusion on Future prospects reached because: (i) the Future prospects for Range are good; (ii) the Future prospects for Population are good; and (iii) the Future prospects for Habitat for the species are poor. Overall assessment of Conservation Status is Unfavourable-inadequate because two of the conclusions are Unfavourable-inadequate. 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 - stable. The Overall assessment of Conservation Status has changed between 2013 and 2019 because the conclusion for Population has changed from Unknown to Favourable, the conclusion for Habitat for the species has changed from

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Favourable to Unfavourable-inadequate and the conclusion for Future Prospects has changed from Unknown to Unfavourable-inadequate.
The overall trend in conservation status is the same as in 2013.

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

b) Minimum

c) Maximum

d) Best single value

12.2 Type of estimate

12.3 Population size inside the network Method used

12.4 Short-term trend of population size within the network Direction

12.5 Short-term trend of population size within the network Method used

12.6 Additional information

13. Complementary information

13.1 Justification of % thresholds for trends

13.2 Trans-boundary assessment

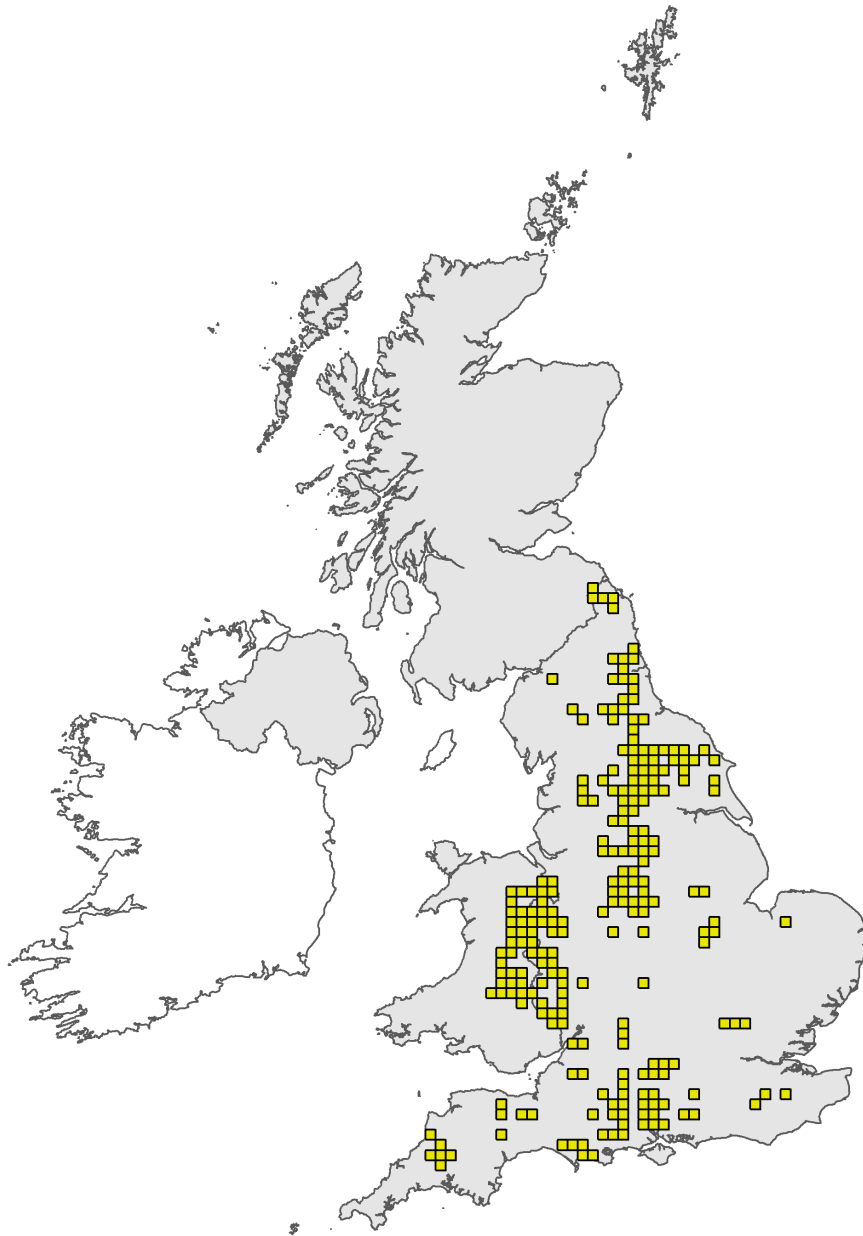13.3 Other relevant Information

Distribution Map

Figure 1: UK distribution map for S1109 - Grayling (*Thymallus thymallus*). 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.
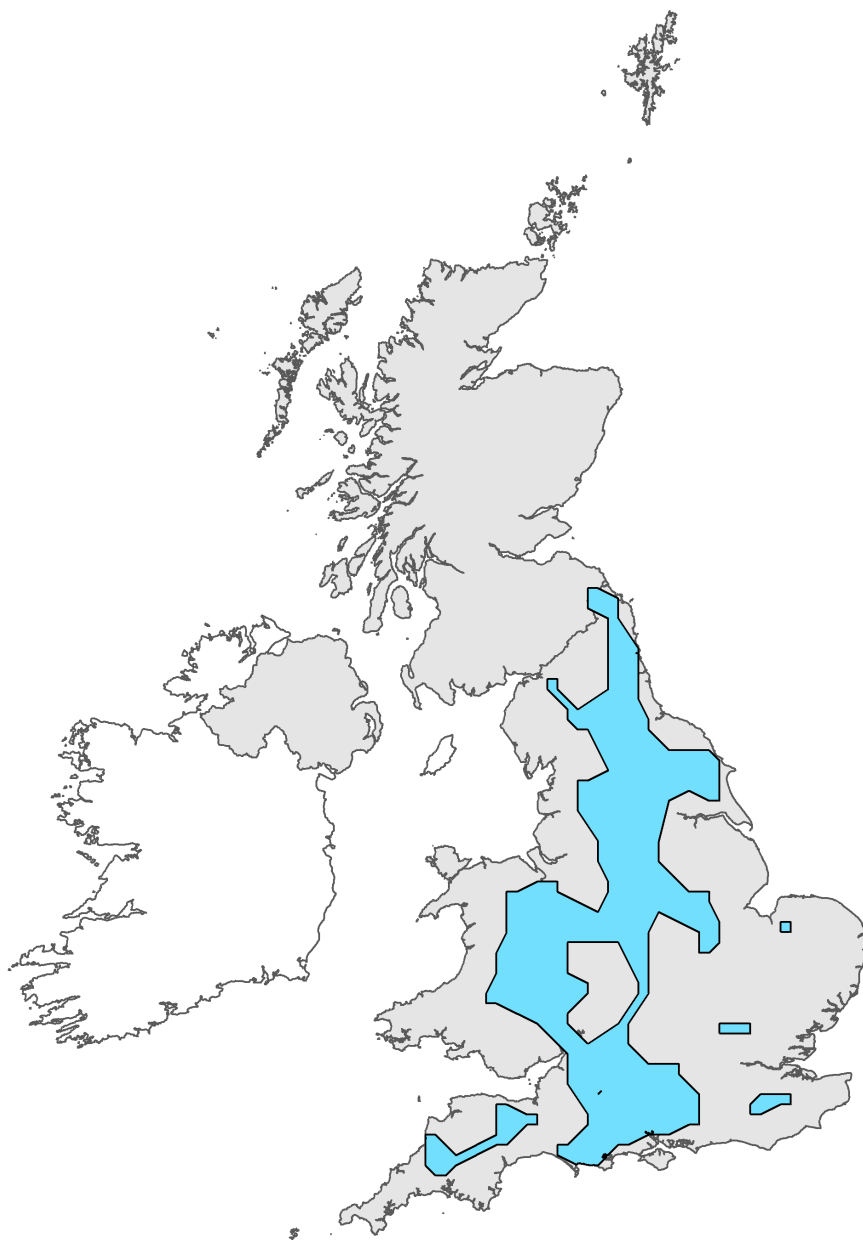
Range Map

Figure 2: UK range map for S1109 - Grayling (*Thymallus thymallus*). 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.