

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

**Second Report by the United Kingdom under
Article 17
on the implementation of the Directive
from January 2001 to December 2006**

**Conservation status assessment for :
S1109: *Thymallus thymallus* - Grayling**

Please note that this is a section of the report. For the complete report visit <http://www.jncc.gov.uk/article17>

Please cite as: Joint Nature Conservation Committee. 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

S1109 *Thymallus thymallus* Grayling

Audit trail compiled and edited by JNCC and the Freshwater Inter-Agency Working Group

This document is an audit of the data and judgements on conservation status in the UK's report on the implementation of the Habitats Directive (January 2001 to December 2006) for this species. Superscript numbers accompanying the headings below, cross-reference to headings in the corresponding Annex B reporting form. This supporting information should be read in conjunction with the UK approach for species (see 'Assessing Conservation Status: UK Approach').

1. Range Information^{2.3}

Thymallus thymallus is not widely distributed throughout Britain. It is thought to be native only to parts of England and possibly Wales and is absent from Northern Ireland. It is present in a number of Scottish waters, but all Scottish populations are thought to have been introduced during the last 150 years. Similarly many British populations are also thought to have resulted from introductions (Davies *et al.*, 2004). Since the introductions have become established parts of the overall population, all of these are included in the range and population estimates.

1.1 Surface area of range^{2.3.1} 83,284km²

The above estimate was calculated within Alpha Hull software, using extent of occurrence as a proxy measure for range (see Map 1.1.). Alpha was set at 25 km to reflect the mobility of this species. The alpha hull (range area) was clipped to exclude marine habitat.

1.2 Date of range determination^{2.3.2} 1990 – 2003

Records from the database (Davies *et al.*, 2004) dated 1990 onwards were used to calculate the 'current' extent of occurrence; the most recent record in this database is 2003.

1.3 Quality of range data^{2.3.3} Moderate

At a 10-km square resolution, the freshwater fish database (Davies *et al.*, 2004) provides a relatively good data source for fish across Britain. However, because it comprises records collected from a variety of sources rather than from a blanket survey, it is reported as Moderate for this purpose. (Although, in the case of *T. thymallus*, these records are thought to be fairly comprehensive.)

1.4 Range trend^{2.3.4} and range trend magnitude^{2.3.5} Unknown

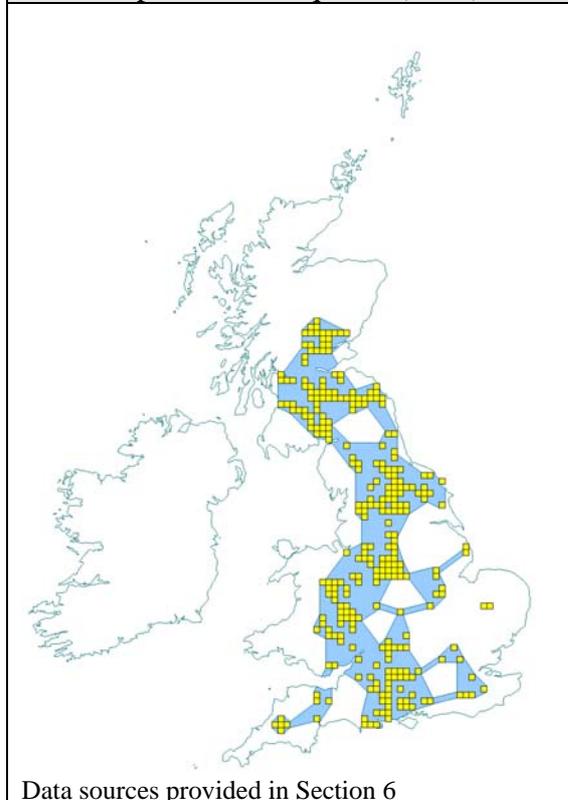
Post-1994 trends in this species are unknown.

1.5 Range trend period^{2.3.6} 1994 – 2006

1.6 Reasons for reported trend in range^{2.3.7}

Not applicable

Map 1.1. Current extent of occurrence and occupied 10-km squares (2007)



1.7 Favourable reference range^{2.7.1}

83,284km² (Equal to current)

The decision tree in Note 1 has been used as a guide in determining the favourable reference range estimate (see ‘Assessing Conservation Status: UK Approach’).

T. thymallus range in 1994 is not known. The nearest alternative is the current estimate: 83,284km². Since current trends are also not known, the only information available to inform whether this area is “suitably large to support the species”, is pre-1994 trend data.

Maitland & Campbell (1992) report that the early post-glacial distribution of *T. thymallus* was limited to river systems in eastern and south-eastern England. However, following an increase in the popularity of angling in the 19th Century, this species was introduced throughout much of England, Wales and southern Scotland. Current data suggests that the species continues to persist across this range (see Map 1.1), which, in turn, indicates that current range is sufficiently large to support the species. For this reason, the favourable reference range has been set as equal to current.

1.8 Range conclusion^{2.8}

Favourable

Current trends are unknown. However, the current range estimate is equivalent to the favourable reference range. For this reason, and in accordance with Annex C, range has been assessed as Favourable.

2. Population of the Species^{2.4}

2.1 Population estimate^{2.4.1}

293 occupied 10-km squares

Records from the database of the freshwater fish atlas (Davies *et al.* 2004) suggest that *T. thymallus* occupies 293 10-km squares (based on records collected between 1990-2003) (see Map 1.1). Although this estimate is derived from a collation of records rather than a complete inventory, based on expert opinion, it provides a relatively accurate portrayal of distribution at this coarse scale. Therefore, in the absence of a more comprehensive population estimate, this figure has been used as a proxy.

2.2 Date of population estimate^{2.4.2}

1990 – 2003

The reported estimate is based on records dated from 1990 onwards from the database (Davies *et al.*, 2004); the most recent record in this database is 2003.

2.3 Method of population estimate^{2.4.3}

2 = extrapolation from surveys of part of the population, sampling

Davies *et al.* (2004) was derived from a variety of sources and as such, was collected by both professionals and volunteers, including the Environment Agency, the former National Rivers Authority, English Nature and anglers.

2.4 Quality of population data^{2.4.4}

Poor

Although the database (Davies *et al.*, 2004) offers relatively good coverage, the scale is too coarse to be considered anything more than poor for the purpose of estimating the *T. thymallus* population.

2.5 Population trend^{2.4.5} and population trend magnitude^{2.4.6}

Unknown

No information was available on post-1994 trends at the time of assessment. The Environment Agency has recently developed a log book scheme, but this has not operated long enough to give any indication of a trend since 1994.

2.6 Population trend period^{2.4.7}

1994 – 2006

2.7 Reasons for reported trend in population^{2.4.8}

Not applicable

Over-fishing, pollution and obstructions to spawning sites.

2.8 Justification of % thresholds for trends^{2.4.9}

Not applicable

2.9 Main pressures^{2.4.10}

211 Fixed location fishing – over-fishing

701 Water pollution – from industrial and agricultural sources

852 Modifying structures of inland water courses – physical changes to habitat that have restricted access to spawning sites or have affected the quality of these habitats

2.10 Threats^{2.4.11}

211 Fixed location fishing – over-fishing

701 Water pollution – from industrial and agricultural sources

852 Modifying structures of inland water courses – physical changes to habitat that are likely to restrict access to spawning or affected the quality of these habitats

2.11 Favourable reference population^{2.7.2}

Unknown

The decision tree in Note 1 has been used as a guide in determining the favourable reference population estimate (see ‘Assessing Conservation Status: UK Approach’).

The 1994 population and post-1994 trends are not known. The nearest, most recent estimate is the current estimate: 293 occupied 10-km squares. The only information available to inform whether this area is “suitably large to support the species”, is pre-1994 trend data.

Although, as discussed under range, this species has been introduced to river systems across Britain (suggesting a historic increase), R. Gardiner (*pers. comm.*) of the Fishers Research Service, and a member of ‘The Grayling Society’, suggests that there is reliable anecdotal evidence from anglers' catches of a decline in numbers of *T. thymallus* in those rivers over the past 25 years.

2.12 Population conclusion^{2.8}

Unknown

There is insufficient information on current population and trends to assess population at this time.

3. Habitat for the Species in the Biogeographic Region or Sea^{2.5}

T. thymallus habitat requirements are, for the most part, typical of that required by other salmonid species, such as Atlantic salmon and trout. It favours clean, well-oxygenated water, and a gravelly or sandy substrate (Maitland & Campbell, 1992; Maitland, 2004). Larvae are found in the marginal zones of vegetated, slow-flowing rivers; larger fry shoals occupy the transitional area between the margins and mid-channel. They are unable to tolerate high water temperatures and are very sensitive to organic pollution (Davies *et al.*, 2004).

3.1 Surface area of habitat^{2.5.2}

Unknown

3.2 Date of estimation^{2.5.3}

Not applicable

3.3 Quality of data on habitat area^{2.5.4}

Poor

Although much is known about the habitat requirements of *T. thymallus* (*e.g.* Ibbotson *et al.*, 2001), there is no estimate available for habitat area available to this species in any of the rivers in which it is present.

3.4 Habitat trend^{2.5.5}

Stable

Organic pollution and industrial pollution have degraded fresh water habitat across the UK. Although pollution levels have been reduced in recent decades (as a result of a decline in heavy industry and investment in the treatment of sewage effluent) actions to control diffuse sources of pollution are in their early stages. Further, there are still issues with physical barriers to migration, which limits the area of freshwater habitat suitable for *T. thymallus* spawning.

However, many of these issues have been addressed in recent years; since 1994, declines in habitat area and quality are thought to have slowed, and possibly reversed. Based on expert opinion, overall, trend is likely to have been stable over this period.

3.5 Habitat trend period^{2.5.6}

1994 – 2006

The trend is judged since the Directive came in, although historically there have been declines.

3.6 Reasons for reported trend in habitat^{2.5.7}

Not applicable

3.7 Suitable habitat for the species (in km²)^{2.7.3}

Not applicable

3.8 Habitat conclusion^{2.8}

Unknown

There is insufficient information to assess habitat for the species at present.

T. thymallus favours clean water and is intolerant of high water temperatures. Historically, the quality of freshwater habitat in the UK has suffered decline; more recently this decline has slowed or reversed. However, in the absence of population trend data, it is not possible to make an informed judgement regarding whether the habitat is currently suitable for the long term survival of the species or not. For this reason, a judgement of Unknown is most appropriate.

4. Future Prospects^{2.6}

Good prospects

Species expected to survive and prosper.

Despite reports of population decline in many rivers, prospects for the recovery of *T. thymallus* over the next 12 years are good. The Water Framework Directive ensures that water quality and the quality of in-river habitats are likely to improve in accordance with wider river basin management strategies. The development of *T. thymallus* fisheries management strategies (e.g. EA 2003) and the development of a logbook recording system for this species suggest that rational exploitation of the resource and its future management is assured in England and Wales. Within Scotland, where *T. thymallus* has been introduced, no such strategy exists, although more recently the Scottish Executive has commissioned the production of a Scotland-wide series of all-species fisheries management plans.

4.1 Future prospects conclusion^{2.8}

Favourable

With further improvements to water quality it is anticipated that the species will survive and prosper. This is despite recent reports of population decline. The future management of exploitation will hopefully be able to address this. Hence it is reported as Favourable.

5. Overall Conclusion^{2.8}

Unknown

Although range and future prospects have been identified as Favourable, in accordance with the guidance, the two Unknown judgements for population and habitat trigger an overall conclusion of Unknown.

Table 5.1. Summary of conclusions

Parameter	Judgement	Grounds for Judgement (in accordance with Annex C)	Reliability*
Range	Favourable	Current range is not smaller than the favourable reference range	2
Population	Unknown	No or insufficient information	N/A
Habitat	Unknown	No or insufficient information	N/A
Future Prospects	Favourable	Main pressures and threats to the species not significant; species will remain viable in the long-term	2
Overall Assessment	Unknown	Two or more Unknown combined with Favourable	N/A

*1=High, 2=Moderate, 3=Low

High – Expert opinion is that the concluding judgement accurately reflects the current situation based on a professional understanding of the species. For range, population, and habitat, quality of data used to establish the current estimate has been identified as “good”; data used to inform trends is comprehensive and up to date.

Moderate – A greater understanding of the feature, or the factors affecting it, is required before a confident concluding judgement can be made by experts. For range, population, and habitat, the current estimate and/or trend are based on recent, but incomplete or limited survey data; or alternately, a comprehensive, but outdated (pre-1994) review.

Low – Judgements, and comprising estimates, are based predominately on expert opinion.

N/A – Assessment conclusion is unknown, on the basis of insufficient reliable information

6. References

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Map Data Sources

Biological Records Centre - Database for the Atlas of Freshwater Fishes (via the NBN Gateway)