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 :

S1149: *Cobitis taenia* - Spined loach.

S1149 *Cobitis taenia* Spined loach

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]

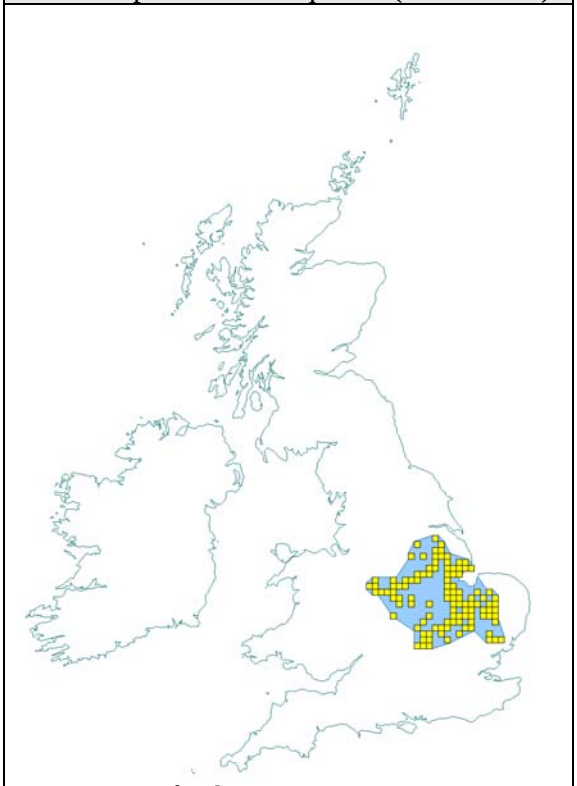
In the UK, the natural range of the *Cobitis taenia* is restricted to river systems in eastern England, namely the Rivers Trent, Welland, Witham, Nene and Great Ouse, and their associated waterways (Perrow & Jowitt 2000). The species is absent form Scotland, Wales and Northern Ireland.

1.1 Surface area of range[2.3.1]

23,655km^2

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

Map 1.1. Current extent of occurrence and occupied 10-km squares (1990-2003)



See Section 6 for data sources

1.2 Date of range determination[2.3.2]

1990 – 2003

Records from the database for the freshwater fish atlas (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 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, data quality is reported as moderate.

1.4 Range trend[2.3.4] and range trend magnitude[2.3.5]

Stable

In recent years, there has been no evidence of a noticeable change in range (Davies *et al.* 2004).

1.5 Range trend period [2.3.6]

1994 – 2003

The reported trend is based on information in the Atlas of Freshwater Fishes (Davies *et al.* 2004); the most recent record in the supporting database is 2003.

1.6 Reasons for reported trend in range[2.3.7]

Not applicable

1.7 Favourable reference range[2.7.1]

23,655km^2 (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').

Until recently, little was known about this species. However, it is thought that *C. taenia*'s restricted range is associated with the last Ice Age, when eastern England was linked to mainland Europe by a land bridge. Davies *et al.* (2004) suggest that the lack of commercial or angling interest has served to restrict deliberate and/or accidental spread to other catchments, meaning that this historic distribution pattern probably remains largely intact today.

On this basis, it is sensible to assume that the current estimate is sufficiently large to allow the long term survival of the species, and hence has been set as the favourable reference range.

1.8 Range conclusion[2.8]

Favourable

Current range is stable, and equivalent to the favourable reference range. The judgment is therefore Favourable.

2. Population of the Species[2.4]

2.1 Population estimate[2.4.1]

Unknown

In the UK, *C. taenia* appears to be restricted to just five east-flowing river systems in eastern England – the Rivers Trent, Welland, Witham, Nene and Great Ouse, with their associated waterways (Perrow & Jowitt 2000). Within these catchments it occurs patchily in a variety of waterbodies, including small streams, large rivers and both large and small drainage ditches. Little is known about its occurrence in open water, although it is known from a number of small lakes and gravel-pits. With limited means of dispersal, the UK populations are largely genetically isolated from each other.

Records from the database of the freshwater fish atlas (Davies *et al.* 2004) suggest that *C. taenia* occupies 104 10-km squares (based on records collected between 1990-2003). However, this species is rarely caught in fish surveys and almost never in anglers' catches due to its small size. Therefore at present, a true population estimate is unknown.

2.2 Date of population estimate[2.4.2]

Not applicable

2.3 Method of population estimate[2.4.3]

Not applicable

2.4 Quality of population data[2.4.4]

Poor

There is limited information on *C. taenia* populations at a local scale; it is rarely caught in fish surveys and almost never in anglers' catches due to its small size. Although the database of the freshwater fish atlas (Davies *et al.* 2004) offers relatively good coverage at a 10km scale, it is not sufficient for estimating population. Data quality is therefore poor.

2.5 Population trend[2.4.5] and population trend magnitude[2.4.6]

Unknown

No national population trend data is currently available for the *C. taenia*.

2.6 Population trend period[2.4.7]

1994 – 2006

2.7 Reasons for reported trend in population[2.4.8]

Not applicable

2.8 Justification of % thresholds for trends[2.4.9]

Not applicable

2.9 Main pressures[2.4.10]

Because there is such limited information on *C. taenia*, identification of main pressures is difficult. However, similarly to other UK fish species, it is likely to be been affected by:

290 Hunting, fishing or collecting activities not referred to above - Excessive stocking of benthivorous (bottom-feeding) fish for angling

701 Water pollution
952 Eutrophication
852 Modifying structures of inland water courses - reduction of habitat diversity caused by inappropriate management of river and/or stream channels

2.10 Threats[2.4.11]

C. taenia's apparently fragmented distribution in highly regulated rivers and drains, means that it is potentially vulnerable to changes in river/land use. Further, any large-scale disturbance to the spawning process or juvenile development, either physical or chemical, will have a disproportionate effect on *C. taenia* populations because the fish has a short life cycle and is consequently highly dependent on good recruitment into the adult population each year.

Key threats are likely to include:
290 Hunting, fishing or collecting activities not referred to above - Excessive stocking of benthivorous (bottom-feeding) fish for angling
701 Water pollution
952 Eutrophication
852 Modifying structures of inland water courses - reduction of habitat diversity caused by inappropriate management of river and/or stream channels

2.11 Favourable reference population[2.7.2]

Unknown
At present, there is insufficient information available on current population and trends to suggest a meaningful favourable reference population.

2.12 Population conclusion[2.8]

Unknown
There is insufficient information available to make a judgement on the status of *C. taenia* populations at this time.

3. Habitat for the Species in the Biogeographic Region or Sea[2.5]

Perrow & Jowitt (1997) conclude that the optimal habitat for a *C. taenia* consists of a sandy substrate with patchy, dense macrophytes; they use a complex branchial apparatus to filter-feed in fine but well-oxygenated sediments.

3.1 Surface area of habitat[2.5.2]

Unknown
As was discussed for range, *C. taenia* appears to be restricted to just five east-flowing river systems in eastern England – the Rivers Trent, Welland, Witham, Nene and Great Ouse, with their associated waterways (Perrow & Jowitt 2000). Within these catchments it appears to occur patchily in a variety of waterbodies, including small streams, large rivers and both large and small drainage ditches. However, the area of the 'used' habitats is unknown. Further, although it is known from a number of small lakes and gravel-pits, there is little information about its occurrence in open water.

3.2 Date of estimation[2.5.3]

Not applicable

3.3 Quality of data on habitat area[2.5.4]

Poor

Although the *C. taenia*'s habitat requirements have been documented (*i.e.* Maitland & Campbell, 1992; Perrow & Jowitt, 2000; Davies *et al.*, 2004; Maitland, 2004), there is no estimate available for habitat area.

3.4 Habitat trend[2.5.5]

Stable

Pollution levels in freshwater systems have been reduced in recent decades, following a decline in heavy industry and investment in the treatment of sewage effluent. Although actions to control diffuse sources of pollution are in their early stages, since 1994, declines in habitat area and quality are thought to have slowed, and possibly reversed. Overall, trend has most likely been stable.

3.5 Habitat trend period[2.5.6]

1994 – 2006

3.6 Reasons for reported trend in habitat[2.5.7]

Not applicable

3.7 Suitable habitat for the species (in km^2)[2.7.3]

Unknown

3.8 Habitat conclusion[2.8]

Unknown

Historically, the quality of freshwater habitat in the UK has declined. Although habitat is now considered stable, during Common Standards Monitoring, four of the SACs designated for this species were identified as unfavourable (a fifth SAC was not assessed). However, the SAC network only represents a portion of the total UK resource and there is no information on *C. taenia* outside this network. Further, at a coarse scale, there is no evidence to suggest these habitat declines have contributed to a decline in range (which is, and appears to have been, relatively stable), and at a population scale, impacts are unknown.

Based on this, it is difficult to make a confident judgement on whether habitat is suitable for the long-term survival of the species. Based on expert opinion alone, the answer is likely to be yes. However with pressures relatively unknown, it is more appropriate to report Unknown until reliable population data is available.

4. Future Prospects[2.6]

Good prospects

Species is expected to survive and prosper.

C. taenia is being considered as a priority species under the UK Biodiversity Action Plan. Further, five SACs have been designated for this species. Although they are not currently in Favourable condition, the 2007 condition site assessments suggest that are good prospects for restoration. Further, with recent growing interest in this species, efforts are being made to increase understanding of population and current trends. Therefore, based on the limited information currently available, prospects over the next 12 years are most probably good. However, this is reported with low confidence.

4.1 Future prospects conclusion[2.8]

Favourable

5. Overall Conclusion [2.8]

Unknown

Range and prospects are Favourable. However, because both population and habitat assessments are unknown, the overall assessment, by default, is also unknown.

Table 5.1. Summary of conclusions

Parameter	Judgement	Grounds for Judgement (in accordance with Annex C)	Reliability*
Range	Favourable	Range is stable and not smaller than the favourable reference range	2
Population	Unknown	No or insufficient reliable information available	N/A
Habitat	Unknown	No or insufficient reliable information available	N/A
Future Prospects	Favourable	Main pressures and threats to the species not significant; species will remain viable for the foreseeable future	3
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

DAVIES, C. E., SHELLEY, J., HARDING, P. T., MCLEAN, I. F. G., GARDINER, R. & PEIRSON, G., eds. 2004. *Freshwater fishes in Britain - the species and their distribution.* Colchester:.Harley Books

MAITLAND, P. S. & CAMPBELL, R. N. 1992. *Freshwater Fishes of the British Isles.* London: HarperCollins

PERROW M.R. & JOWITT A.J.D. 2000. On the trail of the spined loach: developing a conservation plan for a poorly known species. *British Wildlife* **11**, 390-397.

PHILLIPS, R. & Rix, M. 1985. A *Guide to the Freshwater Fish of. Britain*, Ireland and Europe. Treasure Press, London.

MANN, R. H. K. 1996. Species Action Plan: spined loach Cobitis taenia. *Report to English Nature in association with the Environment Agency*

PERROW, M. R. & JOWITT, A. J. D. 1997. The habitat and management requirements of spined loach *Cobitis taenia*. *English Nature Research Report* No 244

Map Data Sources

Database for the Atlas of Freshwater Fishes (via the NBN Gateway)