

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 :
S1163: *Cottus gobio* - Bullhead.

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

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S1163 *Cottus gobio* Bullhead

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}

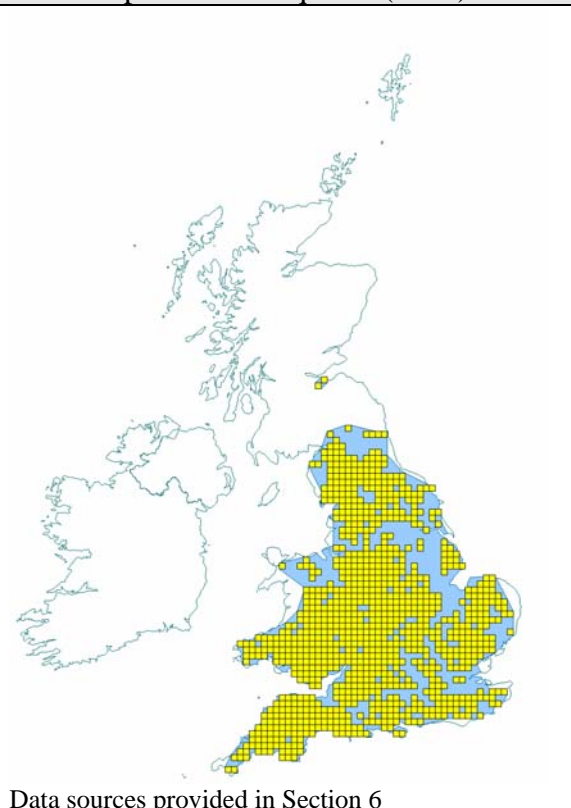
In the UK the native range of *Cottus gobio* is restricted to England and Wales, although some introduced populations are established in Scotland. Maps of the actual range of *C. gobio* are shown below.

1.1 Surface area of range^{2,3,1}

140,005 km²

The above estimate was calculated within the Alpha Hull software. Extent of occurrence was used as a proxy measure for range (see Map 1.1). The value of alpha was set at 25 km to reflect the mobility of this species. The range area was clipped to include inland areas only.

Map 1.1. Current extent of occurrence and occupied 10 km-squares (2002)



1.2 Date of range determination^{2,3,2}

1990 – 2003

Records from 1990 to 2003 were used to calculate the current extent of occurrence; 2002 was the most recent available record. These provide the best available representation of current range, as it is understood by species experts.

1.3 Quality of range data^{2.3.3}

Good

Although data was compiled from a variety of sources, survey coverage of *C. gobio* has been fairly extensive in the UK. At this coarse scale, data provides a good representation of UK extent as it is understood by species experts.

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

Stable

C. gobio has always been a widespread species in the UK. Records from the NBN Gateway (including the Database and Atlas of Freshwater Fish) were examined over three discrete time periods: pre-1972 (1972 was the publication date of Peter Maitlands FBA key to freshwater fish which included distribution maps); 1972 to 1991; and post-1992 (when the Habitats Directive was introduced). No evidence was found of a notable decline in range. If anything, records suggest a slight increase. However, this has been attributed to increased recording, and a greater interest in the species since 1992.

Based on expert opinion, range has most likely remained stable since the Directive came into force in 1994.

1.5 Range trend period^{2.3.6}

1994 – 2006

1.6 Reasons for reported trend in range^{2.3.7}

Not applicable

1.7 Favourable reference range^{2.7.1}

140,005 km² (Equal to current)

Records indicate that *C. gobio* has not suffered any notable historical declines, and from what is understood about this species, it appears to occupy all of its potential native range in the UK. The current estimate is therefore a suitable baseline for the favourable reference range.

1.8 Range conclusion^{2.8}

Favourable

Current range is stable (possibly increasing), and equivalent to the favourable reference range. Therefore, 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}

997 occupied 10-km squares

There are no population estimates for this species.

Map 1.1 suggests that *C. gobio* occupies 997 10-km squares (based on records published in Jackson and McLeod, 2000) (see Map 1.1). Although this estimate is derived from a collation of records rather than a complete inventory, it offers a sufficient 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}

2002

Data published by Jackson and McLeod (2000) were used to calculate occupied 10-km squares.

2.3 Method of population estimate^{2.4.3}

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

Data used to calculate the number of occupied 10-km squares comprised collections of incidental sightings, and local survey data.

2.4 Quality of population data^{2.4.4}

Poor

C. gobio is not routinely surveyed by the environment or conservation agencies. As it is at a 10 km resolution, the current estimate provides no information about abundance at site level, or species density, and no quantitative data exist to assess populations at a finer resolution.

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

Unknown

There is insufficient data to report a trend magnitude/direction with any degree of confidence. However *C. gobio* is typically a common fish, and there appears to be no clear evidence for substantial recent decline.

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}

C. gobio is subject to a wide range of pressures. Those key to species decline include:

200 Fish and Shellfish Aquaculture

300 Sand and gravel extraction

701 Water pollution

811 Management of aquatic and bank vegetation for drainage purposes

830 Canalisation

850 Modification of hydrographic functioning, general

852 Modifying structures of inland water courses

853 Management of water levels

900 Erosion

910 Silting up

971 Competition – for habitat, particularly with the introduced signal crayfish

965 Predation – particularly by introduced signal crayfish

2.10 Threats^{2.4.11}

200 Fish and Shellfish Aquaculture

300 Sand and gravel extraction

701 Water pollution

811 Management of aquatic and bank vegetation for drainage purposes

830 Canalisation

850 Modification of hydrographic functioning, general

852 Modifying structures of inland water courses

853 Management of water levels

900 Erosion

910 Silting up

971 Competition – for habitat, particularly with the introduced signal crayfish

965 Predation – particularly by introduced signal crayfish

2.11 Favourable reference population^{2.7.2}

Unknown

Further research is needed to determine the population density of *C. gobio* under (semi) natural conditions, before a favourable reference population in the UK can be derived.

2.12 Population conclusion^{2.8}

Unknown

There is insufficient information on current population and trends to make a judgement on population at this time.

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

Although *C. gobio* can tolerate substantial habitat modification, the best populations tend to be found in semi-natural river reaches. Its key ecological requirements are good water quality; a stony substrate free from excessive siltation and sufficient cover from overhanging vegetation or woody debris. Habitat H3260 'Rivers with *Ranunculion fluitantis* and *Callitriche-batrachion* vegetation' is a key habitat for this species in the UK. The introduced signal crayfish *Pacifastacus leniusculus*, which is now widespread in England, is a serious threat to *C. gobio* populations, and barriers to migration cause population fragmentation (Tomlinson & Perrow, 2003).

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

There is no area estimate at present for *C. gobio* habitat.

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 km²)^{2.7.3}

Unknown

3.8 Habitat conclusion^{2.8}

Unknown

Historically, the freshwater habitat for this species has suffered a decline in the UK. Although habitat is now considered stable, during Common Standards Monitoring, 86% of the 19 SACs that support this species were identified as Unfavourable. However, the SAC network only represents a portion of the total UK resource.

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). Based on an expert understanding of the species, habitat quality is probably sufficient for *C. gobio* populations to reproduce effectively across much of its range in England and Wales.

For these reasons, habitat has been assessed as Favourable. However, in the absence of population trend data (and hence a detailed understanding of the impacts of signal crayfish), this judgement is made with low confidence.

4. Future Prospects^{2.6}

Unknown

There is insufficient reliable information to make a judgement on bullhead at this time.

Currently, the range of *C. gobio* in the UK seems to be stable or increasing slightly. This is partly due to better knowledge and recording of the species in recent times. However, there is no reason to suppose this trend will change over the next 12 years.

C. gobio continues to be under threat from a range of pressures (listed in 2.10), including signal crayfish. Although the spread of signal crayfish can be limited, at present there is no means of eradicating them. However, based on the information available it is difficult to determine the extent of this threat, particularly since there is no population trend data for this species.

Following historic declines in water quality, the Water Framework Directive may help to improve the quality of *C. gobio* habitat, but many kilometres of *C. gobio* streams are considered to be 'small water bodies' and are therefore not covered by Water Framework Directive measures.

4.1 Future prospects conclusion^{2.8}

Unknown

5. Overall Conclusion ^{2.8}

Unknown

Table 5.1. Summary of conclusions

Parameter	Judgement	Grounds for Judgement (in accordance with Annex C)	Reliability*
Range	Favourable	Current range is stable and not smaller than the favourable reference range	2
Population	Unknown	Insufficient reliable information available	N/A
Habitat	Unknown	Habitat extent and quality considered suitable for the long-term survival of the species	3
Future Prospects	Unknown	Insufficient reliable information available	N/A
Overall Assessment	Unknown	One Favourable combined with two or more unknowns	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

Centre for Environment Fisheries and Aquatic Science (CEFAS) & Environment Agency. 2006. Annual assessment of salmon stocks and fisheries in England and Wales, 2005. Cardiff: Environment Agency.

DAVIES, C.E., SHELLEY, J., HARDING, P.T., MCLEAN, I.F.G., GARDINER, R. AND PEIRSON, G. 2004. *Freshwater Fishes in Britain - the species and their distribution*, 176pp. Colchester: Harley Books.

Environment Agency 2004. *Surface waters at risk of not achieving good ecological status under the Water Framework Directive*. Available via the internet at http://www.environment-agency.gov.uk/commondata/acrobat/sw_at_risk_v1_1007365.pdf

JACKSON, D.L. & MCLEOD, C.R. (Editors), 2000. Handbook on the UK status of EC Habitats Directive interest features: provisional data on the UK distribution and extent of Annex I habitats and the UK distribution and population size of Annex II species, Revised 2002, *JNCC Report 312*, 180 pages, ISSN 0963 8091 www.jncc.gov.uk/page-2447

MAITLAND, P.S. 1972. *Key to British Freshwater Fishes*. Ambleside: Freshwater Biological Association.

MCLEOD, C.R., YEO, M., BROWN, A.E., BURN, A.J., HOPKINS, J.J. AND WAY, S.F. (eds.) (2007) *The Habitats Directive: selection of Special Areas of Conservation in the UK*. 2nd edn. Peterborough: Joint Nature Conservation Committee. www.jncc.gov.uk/SACselection

TOMLINSON, M.L. & PERROW, M.R. 2003. *Ecology of the Bullhead*. *Conserving Natura 2000 Rivers Ecology Series No. 4*. Peterborough: English Nature

Map Data Sources

Biological Records Centre - Database for the Atlas of Freshwater Fishes; Dorset Environmental Records Centre - Dorset SW Pilot species dataset; SW Pilot Project BAP Species Inventory 2002 - Bristol Regional Environmental Records Centre (via the NBN Gateway)