

**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 :
S1103: *Alosa fallax* - Twaite shad.**

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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S1103 *Alosa fallax* Twaite Shad

Audit trail compiled and edited by JNCC and the UK Inter-Agency Freshwater 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, spawning stocks of *Alosa fallax* are known to occur in only a few rivers in Wales and on the England/Wales border, flowing into the Severn estuary (Carstairs, 2000). No spawning stocks are known north of this, although the species is present in south-west Scotland in rivers flowing into the Solway Firth, where hybrids with *Alosa alosa* have been reported (Maitland & Lyle, 2001). A historical spawning population in the River Thames has been recorded (Arahamian *et al.*, 1998).

1.1 Surface area of range^{2.3.1}

10,582 km²

The above estimate was calculated within Alpha Hull software, with extent of occurrence used as a proxy measure for range (see Map 1.1). Alpha was set at 25 km, and was clipped to include inland habitat only.

However, the range estimate includes all inland records, not just spawning stocks; the Environment Agency is aware of just four spawning populations in the Seven, Wye, Usk and Tywi (R. Handley, pers. comm). Hence some of these may be individual records of presence/absence and should be viewed with caution.

1.2 Date of range determination^{2.3.2}

1990 – 2002

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

1.3 Quality of range data^{2.3.3}

Poor

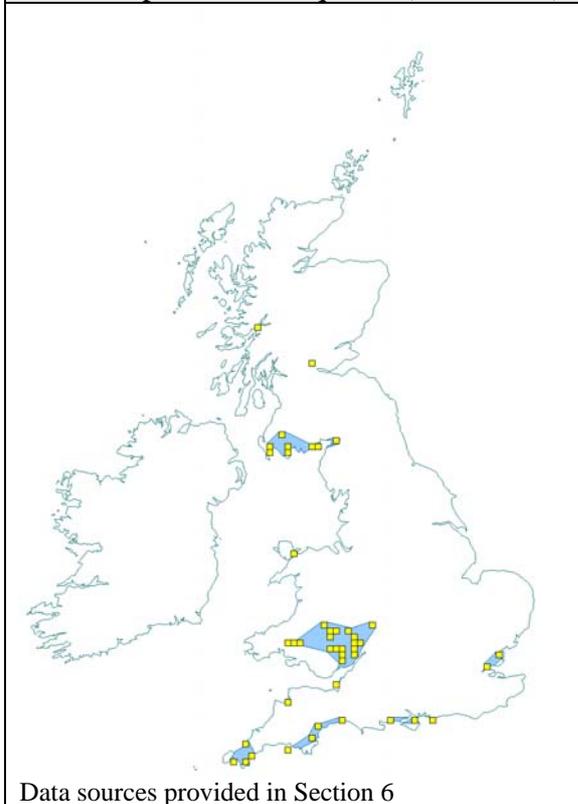
At a 10-km square resolution, the Database for the Atlas of Freshwater Fishes (from which most of the data has been extracted), provides a relatively good data source for most fish across Britain. However, by necessity, records from a wide date range have been used to map current extent of occurrence. Further, it can be difficult to distinguish between this species and its close relative *A. alosa*. For these reasons, data quality is reported as poor.

1.4 Range trend^{2.3.4} & Range trend magnitude^{2.3.5}

Stable

The latest UK trend recorded in the Biodiversity Action Reporting System suggests that the population (and hence also range) is stable (www.ukbap-reporting.org.uk 'National Action Plan - Latest UK Trend'). However, this is based on 'best guess' only.

Map 1.1. Current extent of occurrence and occupied 10-km squares (1990-2002)



N.B. Range maps are illustrative only. They are bound by the limitations of the Alpha hull software, therefore some *A. fallax* populations may appear landlocked when, in reality, this will not be the case. Furthermore, this map shows both presence/absence and known spawning populations. Hence should be interpreted with caution.

1.5 Range trend period^{2.3.6} **2002 – 2005**

1.6 Reasons for reported trend in range^{2.3.7} **Not applicable**

1.7 Favourable reference range^{2.7.1} **Unknown**

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').

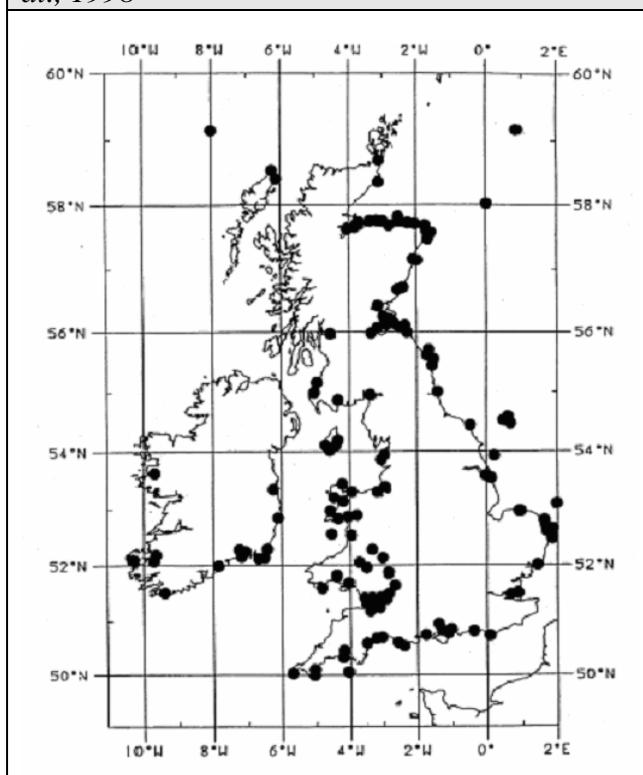
Recent trends (2002-2005) were identified as stable. However, this was based on best guess only. It is therefore not considered a suitable indicator for determining the favourable reference range.

Historically, *A. fallax* has been recorded from most areas around the British Isles (Aprahamian *et al.*, 2003); Aprahamian *et al.* (1998) state that it was historically recorded in

37 UK waters, four of which were known to support spawning populations (rivers Wye, Usk, Severn, Tywi and Thames) (see Map 1.2). The species no longer has access to much of those spawning grounds on the Rivers Severn and Thames. Unfortunately, the date range to which Aprahamian *et al.* (1998) refers is unknown, meaning that a pre-1994 rate of decline cannot be determined.

Based on expert opinion, the favourable reference range will exceed the current range. However, in the absence of reliable pre- and post-1994 trend information, it is not possible to determine to what extent these estimates would differ. The favourable reference range has therefore been reported Unknown.

Map 1.2. Coastal distribution of *A. fallax* in the British Isles (date range unknown) From Potts and Swaby, 1993, as cited in Aprahamian *et al.*, 1998



N.B. Map 1.1 shows both presence/absence and known spawning populations. Map 1.2 contains only presence/absence data. Hence they must be interpreted with caution.

1.8 Range conclusion^{2.8}

Unknown

There is insufficient information to report on range at present.

2. Population of the species^{2.4}

2.1 Population estimate^{2.4.1}

100, 000 individuals

The UK population is 100, 000 individuals (see Table 2.1). However, in the absence of a quantitative monitoring programme, data represents a 'best guess' only.

2.2 Date of population estimate^{2.4.2} **2005**

2.3 Method of population estimate^{2.4.3}

1 = based on expert opinion

There are currently no comprehensive population estimates.

2.4 Quality of population data^{2.4.4}

Poor

Table 2.1. 2005 National Status

Country	Population (no. of individuals returning to fresh water to spawn)	Accuracy
England	25,000	Best guess
Scotland	1,000	Best guess
Wales	75,000	Best guess
Northern Ireland		
UK Total	100,000	Best guess

Source: www.ukbap-reporting.org.uk 'National Action Plan - Latest Status'

2.5 Population trend^{2.4.5} & Population trend magnitude^{2.4.6}

Stable

There is no quantitative monitoring programme for this species. Best guess is that the population is stable (www.ukbap-reporting.org.uk 'National Action Plan - Latest Status'). However, there is limited reliable data to substantiate this.

2.6 Population trend period^{2.4.7}

2002 – 2005

The period of the last UK Biodiversity Action Reporting round, during which recent UK trends were reported as stable.

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}

Twaite shad are a migratory species and hence are subject to a wide range of pressures both in the marine and freshwater environment:

110 Use of pesticides

120 Fertilisation

300 Sand and gravel extraction

420 Discharges

701 water pollution

852 modifying structures of inland water courses

853 management of water levels

910 Silting up

920 Drying out
952 eutrophication

2.10 Threats^{2.4.11}

110 Use of pesticides
120 Fertilisation
300 Sand and gravel extraction
420 Discharges
701 water pollution
852 modifying structures of inland water courses
853 management of water levels
910 Silting up
920 Drying out
952 eutrophication

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').

Although a current estimate and trend have been reported, these are based on 'best guess' alone; they are not considered sufficient for determining viability or risk to stochastic events. The favourable reference population has therefore been reported as unknown, until a more comprehensive data set is made available.

2.12 Population conclusion^{2.8}

Unknown

Aprahamian *et al.* (1998) states that, from data in the Severn Estuary and Bristol Channel, the current status of the *A. fallax* population in the British Isles would appear to be relatively healthy. Recruitment since 1990 was recorded as fairly stable (Aprahamian *et al.*, 1998). However, with so little reliable information on current population and trends, and an unknown favourable reference population, the conclusion for population can only be reported as Unknown.

3. Habitat for the species in the Biogeographic region or sea^{2.5}

The habitat requirements of twaite shad are not fully understood.

Freshwater Habitat – rivers with good water quality with unimpeded access to and from the sea. Clean, well-oxygenated gravels are required for spawning. Juveniles require slow flowing nursery areas in freshwater above the estuary.

Marine habitat – this aspect is poorly understood, but they seem to be mainly coastal and pelagic in habit. They have been reported from depths 10-150 m. A suitable estuarine habitat is likely to be very important for adults and juveniles (Maitland & Hatton-Ellis, 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

Relatively little is known about the marine habitats occupied by *A. fallax*, and total habitat area is unknown.

3.4 Habitat trend^{2.5.5}

Stable

Physical barriers to migration (constructed prior to 1994) limit the area of freshwater habitat suitable for *A. fallax* spawning, including weirs, bridge footings, etc. Recent work has also suggested that regulation releases from reservoirs can have an impact on *A. fallax* spawning due to the change in water temperature. However, overall, habitat has most likely remained stable since the Habitat Directive came into force in 1994.

3.5 Habitat trend period^{2.5.6}

1994 – 2006

3.6 Reasons for reported trend in habitat^{2.5.7}

Not applicable

Historic declines resulted from organic pollution, industrial pollution and restriction of access by weirs, etc. This decline has curbed in recent years, as a result of positive conservation management and legislation.

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

Unknown

3.8 Habitat conclusion^{2.8}

Unfavourable – Inadequate

Although post-1994 trends were identified as stable, historically, freshwater habitat required by *A. fallax* is thought to have declined in both area and quality due to pollution and the construction of physical barriers. Although water quality conditions are now considered to be improving in the UK, this species no longer has access to much of those spawning grounds on the Rivers Severn and Thames (Arahamian *et al.* 1998).

It is therefore likely that habitat for this species is Unfavourable – Inadequate, at least in the River Seven and River Thames. However, with no population data to substantiate this, the conclusion can only be made with low confidence.

4. Future Prospects^{2.6}

Poor prospects

“Species is likely to struggle unless conditions change”.

A. fallax is the subject of a Species Action Plan under the UK Biodiversity Action Plan. (It is also included on the revised UKBAP list.)

In the early 1990s, the Severn Estuary and Bristol Channel appeared to be relatively healthy, and recruitment was recorded as stable (Arahamian *et al.*, 1998), and there has been no

evidence of a change. However, the loss of spawning grounds on the Rivers Severn and Thames is likely to have increased the vulnerability of populations in these areas. Removal of artificial river obstructions could help to lower this risk. However, there is no current programme for such proposals. Further, habitat destruction by in-channel works continues to be a threat.

It is possible that a warming climate will lead to improved recruitment and lead to favourable conditions for the re-establishment of populations, even over the next 12 years. Shad are sensitive to temperature changes; upstream migration from the estuary appears to be triggered by temperature and eggs are sensitive to water temperatures below 16-18°C. Additional research is required to assess this however, and as yet, the potential impacts of climate on this species are largely unconfirmed.

Therefore, on the basis of known threats and inadequate habitat, the future prospects are poor.

4.1 Future prospects conclusion^{2,8}

Unfavourable – Inadequate

This conclusion comes with a caveat of low confidence on the basis of poor data.

5. Overall Conclusion^{2,8}

Unfavourable – Inadequate

Data is limited, and insufficient for informing the Range, Population and Habitat assessments. Therefore, on the basis of Future Prospects alone, the overall conclusion is Unfavourable – Inadequate.

Table 5.1. Summary of conclusions

Parameter	Judgement	Grounds for Judgement (in accordance with Annex C)	Reliability*
Range	Unknown	Insufficient reliable information available	3
Population	Unknown	Insufficient reliable information available	N/A
Habitat	Unfavourable – Inadequate	Insufficient reliable information available on the effects of current and historic habitat changes at species level	N/A
Future Prospects	Unfavourable – Inadequate	Any other combination There continue to be threats to this species. However as yet, long-term viability is not considered to be at severe risk	3
Overall Assessment	Unfavourable – Inadequate	One or more Unfavourable – Inadequate but no Unfavourable – Inadequate	3

*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

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Map Data Sources

Database for the Atlas of Freshwater Fishes, Biological Records Centre; Marine Life Survey
Data (collected by volunteers) collated by MarLIN, Marine Biological Association; Marine
Nature Conservation Review (MNCR) and associated benthic marine data, Joint Nature
Conservation Committee (via the National Biodiversity Network (NBN) Gateway).