

**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 :
S4056:*Anisus vorticulus* - Little ramshorn whirlpool snail

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

S4056 *Anisus vorticulus* Little ramshorn whirlpool snail

Audit trail compiled and edited by JNCC and the Invertebrate 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').

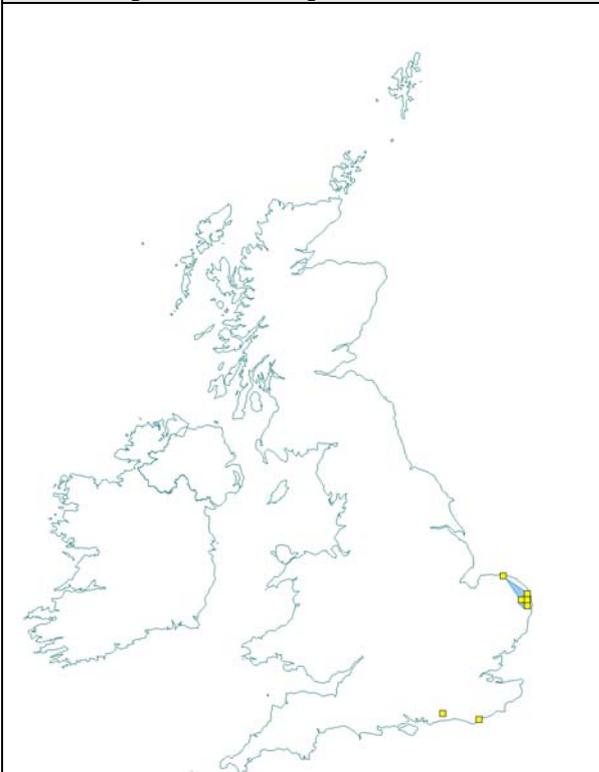
1. Range Information^{2,3}

Anisus vorticulus is restricted to East Anglia and south east England. It is absent from Northern Ireland, Scotland and Wales.

1.1 Surface area of range^{2,3,1} 967 km²

The above estimate was calculated within Alpha Hull software, using extent of occurrence as a proxy measure for range (see Map 1.1), at a 10km resolution. The value of alpha was set at 20km to reflect the dispersal capacity of this species

Map 1.1 Current extent of occurrence and occupied 10 km-squares (1998-2006)



Data sources provided in Section 6

1.2 Date of range determination^{2.3.2}

1998 – 2005

Records collected between 1998 and 2005 (the most recently available data) were used to calculate the current extent of occurrence. Records from this time period provide the best representation of current range as it is understood by experts.

1.3 Quality of range data^{2.3.3}

Moderate

All known extant sites were surveyed as part of the Species Action Plan for *A. vorticulus*. Repeat visits between 1994-2007 have been made to the well-established sites i.e. Arun Valley, Pevensey Levels and Waveney Valley. Therefore, on the basis that this is not a complete inventory, data has been reported as moderate, rather than good.

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

Stable

This species has always had a restricted distribution, but historically, its range did extend farther into Suffolk (see Map 1.2). Recent survey work has shown that the species is present at some sites in East Suffolk, but the work is not yet complete and has not been published (R. Baker *pers comm.*). At this scale the range of *A. vorticulus* has not changed since the Directive came into force in 1994.

1.5 Range trend period^{2.3.6}

1994 – 2005

1.6 Reasons for reported trend in range^{2.3.7}

Not applicable

The species appears to be confined to ditches at mid to late stages of ditch succession, at least 3 years after the ditch has been cleared/managed. It is thought that inappropriate management: over frequent cleaning and deep digging has contributed to population declines, and thus the gradual decline in range. Run-off from arable land may also be a contributory factor.

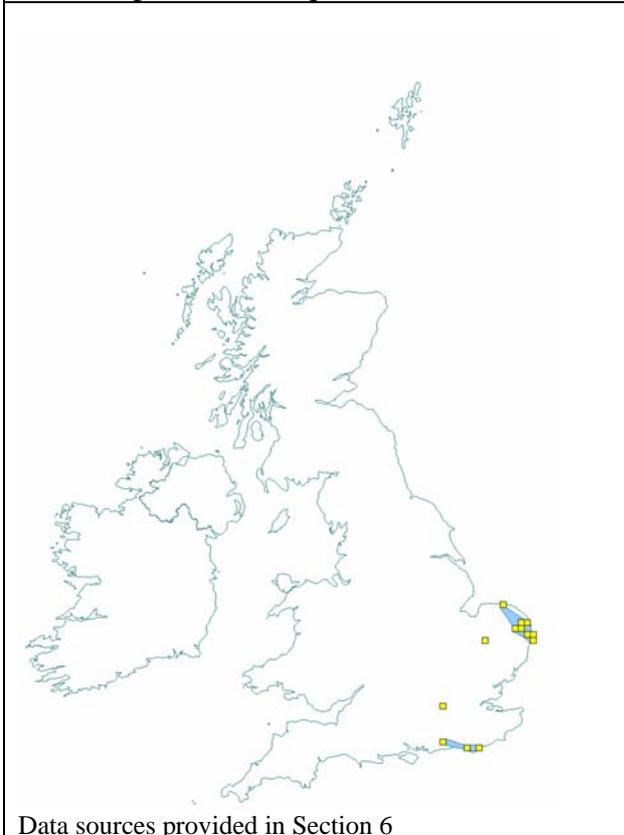
1.7 Favourable reference range^{2.7.1}

967 km² (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').

A. vorticulus has always been a rare species, probably due to natural (geological, dispersal, chemistry etc) barriers that have contributed to a limited distribution of *A. vorticulus* in the UK. Although there has been a decline in range since the 1960s, it is difficult to conclude that the current range is insufficiently large to support extant populations for the foreseeable future. Therefore, although expert opinion is that management should target restoration towards this historic (1960's) extent of occurrence, in line with guidance set by the EU Commission, the favourable reference range has been given as equal to current.

Map 1.2 Historic extent of occurrence
and occupied 10 km-squares (1960-2006)



1.8 Range conclusion^{2.8}

Favourable

Current range is considered Favourable within the terms of the assessment.

2. Population of the Species^{2.4}

Historically, there appear to be records for 34 self-contained colonies/marshes (= 1km-square) in the south-east of England covering 18 10-km squares. Records since 1965 indicate only 13 10km squares have been occupied by *A. vorticulus* (24 colonies/marshes). The last round of monitoring in 1994-2000 indicated that the snail only existed in 5-7 of the previously recorded 10km squares (13 colonies/marshes).

2.1 Population estimate^{2.4.1}

7 10-km squares

Map 2.1 shows that, between 1998 and 2006, *A. vorticulus* was recorded from 7 10km-squares.

2.2 Date of population estimate^{2.4.2}

2002 – 2006

The population was estimated at the end of the last UK biodiversity action reporting round.

2.3 Method of population estimate^{2.4.3}

3 = from comprehensive inventory

The current estimate was based on a complete inventory of all records of distinct marshes containing *A. vorticulus* between 2002 and 2006.

2.4 Quality of population data^{2.4.4}

Good

The estimate was based on a complete inventory. Therefore in accordance with the Commission's guidance, data quality is good.

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

Decreasing

Historically, data for this species is poor, because it has been based on historical references and papers, which rarely used grid references, and offer only vague references to marsh names. Historical data also includes fossil records from Kerney 1999, and therefore tends only to include presence/absence data.

Historic records suggest that in 1965, the species was present in 24 colonies/marshes across 13 10km-squares, with just 13 colonies/marshes in 5-7 squares by 2000 (A. Watson *Pers comm.*)

In the 2005 biodiversity reporting round, *A. vorticulus* was reported as 'declining' (continuing/accelerating) (www.ukbap-reporting.org.uk).

Data for the period 1998-2006 (see Map 1) indicate that *A. vorticulus* was recorded from 7 10km squares, more recent survey work (collated in 2005) records a decline to 7 10km squares i.e. a decline of almost 25%.

2.6 Population trend period^{2.4.7}

2002 – 2005

The trend reported is based on information collected for the 2002-2005 biodiversity reporting round.

2.7 Reasons for reported trend in population^{2.4.8}

3. Direct human influence (restoration, deterioration, destruction);

5. Natural processes

The species appears to be confined to the mid to late-successional stages of ditch succession, 3 or more years after the ditch has been cleared/managed. Over-management of drainage ditches in many areas is thought to have cause population declines.

2.8 Justification of % thresholds for trends^{2.4.9}

Not applicable

2.9 Main pressures^{2.4.10}

802 Management of aquatic and bank vegetation for drainage purposes:

(a) more mechanical and effective machinery, (b) no rotational system in place so ditches are generally uniform and of similar character, (c) connectivity to suitable ditches is reduced, (d) the main drains usually IDB or EA ditches are being dredged more frequently, (e) the minor drains are generally being neglected.

804 Flooding:

(a) Control of water has led to less frequent flooding and for shorter duration – this has led to reduced connectivity.

910 Silting up:

(a) due to larger farms and more emphasis on fencing, the more minor ditches are increasingly being neglected (b) this has led to less variety in the range of successional stages available required to support *A. vorticulus*.

951 Drying out / accumulation of organic material:

Refer to 910 above.

2.10 Threats^{2.4.11}

141 Abandonment of pastoral systems:

(a) Due to larger farms and more emphasis on fencing, the more minor ditches are increasingly being neglected, (b) more mechanical and effective machinery leading to uniform ditches, (c) the switch to arable farming on some marshes has led to inappropriate ditch management and lack of poaching effect by cattle.

800 Landfill, land reclamation and drying out, general:

(a) The switch to arable farming on some marshes has led to inappropriate ditch management and lack of poaching effect by cattle.

802 Management of aquatic and bank vegetation for drainage purposes:

(a) More mechanical and effective machinery, (b) no rotational system in place so ditches are generally uniform and of similar character, (c) connectivity to suitable ditches is reduced, (d) the main drains usually IDB or EA ditches are being dredged more frequently, (e) the minor drains are generally being neglected.

804 Flooding:

(a) Control of water has led to less frequent flooding and for shorter duration – this has led to reduced connectivity.

830 Canalisation:

(a) The main drains usually IDB or EA ditches are being dredged more frequently leading to more sterile and uniform channels with no refuges or habitat niche for *A. vorticulus*.

890 Other human induced changes in hydraulic conditions

Saline intrusion threatens some sites.

910 Silting up:

(a) Due to larger farms and more emphasis on fencing, the more minor ditches are increasingly being neglected (b) this has led to less variety in the range of successional stages available required to support *A. vorticulus*.

951 Drying out / accumulation of organic material:

Refer to 910 above.

2.11 Favourable reference population^{2.7.2}

9 10-km squares (current is 25% below the favourable reference population)

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’).

Current trend is declining but, based on the information available, this trend is not likely to have exceeded 1% per annum since the Habitats Directive came into force.

Based on recent survey work at Hooe Levels on the Pevensey Levels (Willing 2006 and *pers comm.*), the Hooe Levels represent one of the best locations for *A. vorticulus*, with 37% of ditches supporting this species. It may be appropriate, therefore, to set this as a minimum baseline target for other areas. Furthermore, it has been predicted that within a ‘good’ ditch for *A. vorticulus*, you should expect, at the appropriate time of year, to retrieve at least 200 specimens from 5 sampling points (Watson & Ormerod 2004b).

Thus, a ‘favourable’ population would ideally meet both of these criteria. Expert opinion, supported by evidence presented by Watson & Ormerod (2004a), suggests that most populations do not meet these criteria at present. Hence, based on this and Note 1, the favourable reference value has been given as 9 10 km squares i.e. 25% above current population levels. This is a conservative estimate.

2.12 Population conclusion^{2.8}

Unfavourable - Inadequate and deteriorating

The favourable reference value is greater than the current estimate, but not by more than 25%. The *A. vorticulus* population has therefore been assessed as Unfavourable – Inadequate and (to reflect trends) deteriorating.

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

A. vorticulus has only been found in the UK within grazing marshes which are drained by ditches, rhymes, dykes etc. It occurs in the unpolluted, calcareous waters of well-vegetated marsh drains and is occasionally found with other uncommon or vulnerable molluscs such as *Valvata macrostoma*, *Pisidium pseudosphaerium* and *Segmentina nitida* and often found floating on the surface amongst duckweed (*Lemna* spp.). It also shows preference for ditches or channels of >3m in width and >1m in depth with a diverse flora but with a moderate emergent vegetative cover, and often occurs in ditches in wet fields that flood in winter, as this may be important in enabling young snails to colonise new ditches.

3.1 Surface area of habitat^{2.5.2}

Unknown

Area of grazing marsh within occupied sites would provide a crude proxy measure for habitat. However at present, this is not known.

3.2 Date of estimation^{2.5.3}

Not applicable

3.3 Quality of data on habitat area^{2.5.4}

Poor

Distribution of grazing marshes is fairly well-known and recorded (Biodiversity Action Plan priority habitat, HMSO 1995). However, on the basis that an area estimate can not be provided at this time, quality of data is reported as poor.

3.4 Habitat trend^{2.5.5}

Decreasing

Losses of grazing marsh in the whole UK have been significant in the last 60 years, broadly resulting from ecologically insensitive flood defence works, agricultural intensification, declines in traditional management and eutrophication (www.ukbap.org.uk/UKPlans.aspx?ID=9).

In recent years, agri-environment statistics suggest that coastal and floodplain grazing marsh is fluctuating, but probably still declining in the UK. In England, the national trend has been reported as increasing. However, in respect to *A. vorticulus*, outlier marshes (such as Lewes Brook) have been reported as deteriorating (Watson & Ormerod, 2004a), and expert opinion is that there is little scope for their return. Based on this, the overall trend is reported as declining.

3.5 Habitat trend period^{2.5.6} **2002 – 2005**

3.6 Reasons for reported trend in habitat^{2.5.7}

3 = Direct human influence (restoration, deterioration, destruction)

Declines in grazing marsh and associated ditch habitat across the UK are broadly attributed to ecologically insensitive flood defence works, agricultural intensification, declines in traditional management and eutrophication.

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

Unknown

It is known that there are approximately 300,000ha of grazing marsh in the UK. However, not all of this will be 'suitable' for the following reasons:

- 1) Historically, this species has only been found in south-east England. Therefore extensive grazing marsh such as the Somerset Levels and Gwent Levels should be excluded from consideration;
- 2) Only high quality grazing marsh supports this species; it is unlikely that the snail occurred on every grazing marsh in the south-east. They do not appear in (i) brackish marshes such as Stour Valley, Kent, and (ii) small marshes;
- 3) This species is unlikely to occur on newly restored/created grazing marshes unless it was re-introduced; and
- 4) Before the drainage of marshes and the creation of associated ditches, it was likely that this species would have occupied a different habitat i.e. large swamps/open water transition which probably still occur in parts of Europe.

It could therefore be suggested that the area of suitable habitat will be less than 300,000ha. However, since the extent of this 'less than' has yet to be calculated, suitable habitat has been reported as unknown.

3.8 Habitat conclusion^{2.8}

Unfavourable-Inadequate and deteriorating

A. vorticulus habitat is in decline, and it can not confidently be reported that “area of habitat is sufficiently large and habitat quality is suitable for the long term survival of the species” (as would be required for a judgment of Favourable under Annex C guidance), particularly since the biodiversity action plan for this habitat indicates only 3% of the existing grazing marsh habitat in UK is of good conservation quality (HMSO 1995).

However, based on expert opinion, neither can it be reported as “clearly not sufficient for long term survival of the species” (as would be required for a judgement of Unfavourable – Bad).

Therefore, since the broad habitat type for *A. vorticulus* falls between these two categories, a judgement of Unfavourable – Inadequate and (to reflect recent trends) deteriorating has been made.

4. Future Prospects^{2.6}

Poor prospects

“Species is likely to struggle unless conditions change.”

This species has been the subject of a species action plan under the UK Biodiversity Action Plan, and is included on the revised UKBAP list.

The significant decline of *A. vorticulus* from former strongholds such as Amberley Wildbrooks and Pulborough is of major concern. It may be that the snail is a boom and bust species. However, all evidence seems to indicate that it is an annual species that overwinters and breeds in the summer months. In a healthy system, numbers of *A. vorticulus* should therefore be consistent from year to year.

It appears that poor connectivity within the individual marshes is preventing the dispersal of *A. vorticulus* to new ditches. As a ditch becomes silted and choked with vegetation the snail is unable to disperse into more recently cleared ditches. This is a result of 1) ditches being neglected and/or being cleared more frequently, 2) ditches being mechanically cleared, more effective, longer stretches leaving no refuge areas, 3) ditches being done collectively so no rotational system in place, 4) flooding is less frequent so not aiding dispersal across the marsh.

Furthermore, although grazing marshes known to support *A. vorticulus* are generally either protected and/or under sympathetic management, sites such as Purborough Brook are still in decline (Willing 2004, 2005). Outlier marshes are deteriorating and there seems to be little scope for the return of *A. vorticulus*.

Existing assessment of *A. vorticulus* is primarily focused on well-established sites, and yet even in these areas, there is no clear explanation as to why it is still in decline. The outlier sites have not been visited since 1994-2000 and no thoughts have been expressed as to whether *A. vorticulus* has a future at these sites.

For these reasons, it can not confidently be reported that the species will “survive and prosper”. However, given the level of monitoring and management effort that this species received, the species is not predicted to go extinct. Hence, future prospects are reported as poor.

4.1 Future prospects conclusion^{2.8}

Unfavourable – Inadequate

Despite management, populations are continuing to decline. However, on the basis that long term viability is not considered to be at risk at present, in line with Annex C, the assessment is Unfavourable – Inadequate, rather than Unfavourable – Bad.

5. Overall Conclusion^{2.8}

Unfavourable – Inadequate and deteriorating

Range has been assessed as Favourable; all other parameters have been assessed as Unfavourable – Inadequate. Population and habitat have also been identified as deteriorating. The Overall Conclusion is therefore also Unfavourable-Inadequate and deteriorating.

The decline of *A. vorticulus* within traditional UK strongholds is a major concern as well as its apparent loss from outlier sites. It has always been a rare species in the UK confined to south east England, and any decline is likely to be significant within a European context. The UK population represents the most north-westerly distribution and most likely a distinct separate genetic pool.

The dependency of the snail on a vulnerable habitat: grazing marshes of high conservation quality and their associated ditches. With a changing climate, it is likely that these wetlands will change and the apparent effect on the snail is still unclear. This in combination with the poor dispersal ability of the snail makes the overall assessment of this species very poor.

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	Unfavourable – Inadequate and deteriorating	Any other combination Population is below the favourable reference population, but not by more than 25%	1
Habitat	Unfavourable – Inadequate and deteriorating	Any other combination Habitat is declining BUT, [in expert opinion] long term survival is not currently at risk due to current area and quality	3
Future Prospects	Unfavourable – Inadequate	Despite management, populations are declining. No long term viability risks are foreseen at present. However, this may change if declines can not be stabilised.	2
Overall Assessment	Unfavourable – Inadequate and deteriorating	One or more Unfavourable - Inadequate but no Unfavourable - Bad	2

*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

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