

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 :
S1614: *Apium repens* - Creeping marshwort

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

S1614 *Apium repens* Creeping marshwort

Audit trail compiled and edited by JNCC, the Plant Conservation Working Group and the Rare Plants Group of the Ashmolean Natural History Society of Oxfordshire

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}

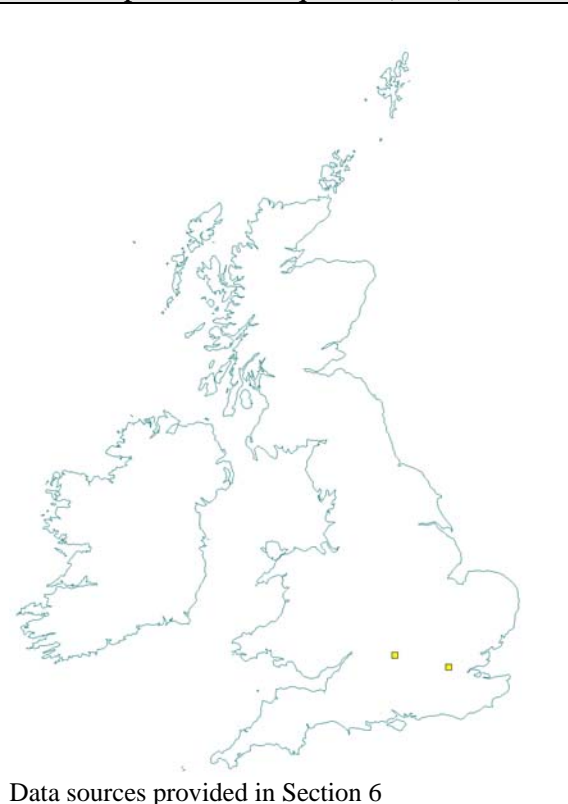
Apium repens occurs in the River Thames catchment near Oxford, and at Walthamstow, Essex; it appeared at Walthamstow Marshes in 2002 following construction of a ditch.

1.1 Surface area of range^{2.3.1}

200km²

The above estimate was calculated using a 10-km square resolution, such that each completely terrestrial square contributes an area of 100 km². The two squares that the species is present in (see Map 1.1) are disjunct, and hence the range estimate is 200 km².

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



1.2 Date of range determination^{2.3.2}

2006

This species has been closely monitored. Hence it is possible to make a judgement on range with high confidence for 2006.

1.3 Quality of range data^{2.3.3}

Good

Extant sites and potential sites have been closely monitored/surveyed over the past decade; the Rare Plants Group of the Ashmolean Natural History Society of Oxfordshire has produced 12 years of annual monitoring reports. Data quality is therefore good.

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

+100%

Since the Habitats Directive came into force in 1994, there has been an increase in range due to the appearance of the Walthamstow population.

1.5 Range trend period^{2.3.6}

1994 – 2006

This date range corresponds to the time period of extensive monitoring by the Ashmolean Natural History Society of Oxfordshire, and is also the relevant period since the Directive came into force.

1.6 Reasons for reported trend in range^{2.3.7}

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

The appearance of the Walthamstow population occurred following conservation work on the site. The range in Oxfordshire is maintained by fairly intense conservation management for the species, including restoration work.

1.7 Favourable Reference Range^{2.7.1}

300km² (Current is more than 10% below favourable reference range)

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').

This species has always had a restricted range in the UK, although the current range is less than occurred in the middle of the twentieth century. It is currently present in only two catchment areas, with multiple sites in one of these catchments. This means that the plant is at substantial risk of extinction from chance events affecting the catchments, and it is unlikely to be viable in the long-term. Expert opinion is that range should include at least one additional catchment to counteract this shared risk. Thus, the minimum favourable reference range has been set as 300 km². This figure would still be low (the extent of occurrence for the date class 1930-1969 is calculated at 610 km²), and consideration needs to be given as to whether this really would be sufficient for long-term viability.

This low-level of increase to reach viability may be justified since 1994 the trend in range has been increasing, although this has been in part due to intensive conservation care. Conservation for this species has a long history, with the classic Oxfordshire site first designated in 1955 (under the 1949 Act). This has ensured the maintenance of this site for the species, whilst introductions and conservation management at other sites have led to an increase in recent years. It is likely that without active conservation work the range for this species would not have increased since 1994, although the exact level of this impact is hard to determine.

1.8 Range Conclusion^{2.8}

Unfavourable – Bad but improving

Although range has increased since the Habitats Directive came into force, the current range is still more than 10% below the favourable reference range. Hence, in accordance with Annex C, the assessment is Unfavourable – Bad. However, because this species has flourished at one of the introduction sites (which suggests it might be possible for its range to be extended) and it has appeared naturally at another disjunct site, it has also been noted as improving.

2. Population of the species^{2.4}

2.1 Population estimate^{2.4.1}

4 localities

The species is found at three localities within 3 km of each other near Oxford (main site - Port Meadow, Binsey Green (restored) and North Hinksey (introduced)), and at one locality at Walthamstow. At all four localities the populations have very different histories and behaviours. Numbers of localities has been used as a proxy for population size, since the populations at each site undergo large fluctuations, making the number of individuals a poor measure.

2.2 Date of population estimate^{2.4.2}

2006

2.3 Method of population estimate^{2.4.3}

3 = from comprehensive inventory

This species is subject to annual monitoring. (12 years of annual monitoring reports by Rare Plants Group of the Ashmolean Natural History Society of Oxfordshire, and annual monitoring by Brian Wurzell and Dave Miller, Lee Valley Park Ranger.)

2.4 Quality of population data^{2.4.4}

Good

Annual monitoring is undertaken at the four localities and the one failed restoration site (Witney) and a search has been made at some former sites.

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

+300%

Since 1994, the number of localities has increased from 1 to 4, giving a trend of +300%. It was introduced to North Hinksey in 1996, and appeared in Binsey Green in 1999 and Walthamstow in 2002.

Within the localities, the size of the populations varies in a number of ways. At the main site (Port Meadow) it fluctuates widely from year to year and returns from the seed bank. At the restored site (Binsey Green) it has increased and then decreased; at the introduction (North Hinksey) site it has increased vegetatively and by seed and flowered profusely. The Walthamstow population has increased.

2.6 Population trend period^{2.4.7}

1994 – 2006

Population trends are considered since the Directive came into force, this is also within the time scale of the Rare Plants Group of the Ashmolean Natural History Society of Oxfordshire annual monitoring reports.

2.7 Reasons for reported trend in population^{2.4.8}

3 = Direct human influence

The increases are all due to direct human intervention: Binsey Green and Walthamstow had conservation restoration measures carried out, and North Hinksey is a reintroduction site.

Variation in population levels within localities is largely due to natural processes. Summer fouling (soil anoxia) in some years caused loss of mature plants which were then made up by seedling emergence in July and August and vegetative spread. Germination was abundant in some years, often following soil anoxia, which may have created open conditions, with low competition, suitable for seedling establishment. Flowering varied between sites and years for reasons which are unclear (McDonald & Lambrick, 2006). Seed set appears to be low suggesting that the seedbank may not be being adequately replenished.

2.8 Justification of % thresholds for trends^{2.4.9}

Not applicable

2.9 Main pressures^{2.4.10}

140 Grazing - Historically, cessation of grazing probably caused the vegetation to become too dense at the Line Ponds in Yorkshire, and also to have suppressed *A. repens* at Walthamstow Marsh. Overgrazing in summer may currently be reducing seed production.

810 Drainage – *A. repens* has suffered from loss of suitable habitat, for instance at Witney where the field become too dry and was improved. Summer flooding of the main site has caused dramatic loss of plants, though it may also be useful in opening the sward.

2.10 Threats^{2.4.11}

990 Other natural processes - Port Meadow is prone to sharp changes following spring/early summer flooding. This causes widespread death of mature plants.

140 Grazing - The level of grazing on Port Meadow appears to be favourable for *Apium repens* at present. However this situation may change if grazing level were to rise or fall substantially.

954 invasion by a species - *Crassula helmsii* (a highly invasive alien)

400 Urbanised areas, human habitation - Residential development on adjacent land may increase the pressures to reduce large scale winter flooding in the Port Meadow area and possibly to use the site to hold water during summer flooding events.

890 Other human induced changes in hydrological conditions - flood relief proposals (Gowing and Youngs, 2005).

2.11 Favourable Reference Population^{2.7.2}

6 localities (Current is more than 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').

In 1994, this species was known at 1 site. Although the current trend is increasing, this can in part be attributed to an introduction programme, and other intensive conservation measures. Further, due to the current number of localities (i.e. 4 sites), this plant is currently classified

as threatened and is considered at high risk from stochastic events. This risk is further exacerbated by the observed population fluctuations. A population which included at least 6 localities would mean that the plant would no longer be classified as threatened in the UK.

A more detailed look at changes in sites is as follows: Henley-on-Thames and Witney on the River Windrush (Thames catchment) (persisted until 1960 and 1970); lost from Yorkshire line ponds and floodplain where the habitat no longer suitable (last seen in 19th Century); in Scotland, there was a record from Sanda Island (1932), which was visited in 1995 and not found (McDonald & Lambrick, 2006). Sites in Early (Berks) and West Wycombe (Bucks) have not been searched recently. Some questions remain regarding the identity of some of the early collections.

2.12 Population Conclusion^{2.8}

Unfavourable – Bad but improving

The current number of localities is more than 25% below the favourable reference population, and hence the assessment is Unfavourable – Bad. However, the trend is markedly positive, and therefore the population assessment is improving.

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

This species is found in unimproved flood-plain pasture (Preston *et al.*, 2001).

The main site, Port Meadow and Wolvercote Common at Oxford, is an extensive neutral grassland on the Thames flood-plain with a history of continuous grazing for thousands of years. The characteristic associations of plants at this site and nearby hay meadows reflect better than any other grassland in Britain the influence of grazing treatment on the balance of species.

The habitat at Walthamstow Marshes is restricted to a moderately open area created by ditch management on the edge of pasture which had been ungrazed for many years and become tall herb vegetation. Grazing has now been restored and it is hoped that open poached areas along the ditch will increase as result of the grazing management.

3.1 Surface area of habitat^{2.5.2}

Unknown

The area covered by the plant at the Oxford sites varies between 100 and 600 m² (C. Lambrick, *pers comm.*).

3.2 Date of estimation^{2.5.3}

Not applicable

3.3 Quality of data on habitat area^{2.5.4}

Not applicable

3.4 Habitat trend^{2.5.5}

Stable

Generally unimproved pasture is threatened in England, having suffered historic declines. Such habitat losses have been observed at former *A. repens* sites, such as Witney, where the fields have become dry and improved, thus unsuitable for this species. However, in more recent years, habitat quality at extant sites has remained good due to sensitive management.

3.5 Habitat trend period^{2.5.6}

1994 – 2006

Habitat quality in the current sites remains good and is stable, but over a longer period there has been a loss of suitable habitat, which has led to losses of former sites and species range.

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

Although this species is found on unimproved flood pasture, this does not mean that all unimproved flood pasture across the country should be considered as 'suitable', because the species appears to have very exacting requirements, which are not yet fully understood. Calculating area of suitable habitat is therefore problematic.

3.8 Habitat conclusion^{2.8}

Unfavourable – Inadequate

Habitat quality at extant sites is good due to sensitive management. However, expert opinion is that habitat area has not yet recovered sufficiently elsewhere to support the favourable reference range and population. For this reason, the habitat assessment is Unfavourable – Inadequate.

4. Future Prospects^{2.6}

Poor prospects

“Species is expected to struggle unless conditions change”.

In the UK, *A. repens* is protected under Schedule 4 of the Conservation (Natural Habitats, etc.) Regulations 1994, and Schedule 8 of the Wildlife and Countryside Act 1981, as amended. It is also subject to close monitoring and intensive conservation measures.

Generally, unimproved pasture is threatened in England and the plant is restricted to a few sites. There are possible threats from *Crassula helmsii*, low winter water levels and high summer water levels. Constant conditions may also be unsuitable, as this appears to be a plant of mobile river floodplains where rapidly changing conditions create open environments in which this plant is an early colonizer.

As yet, few realistic options for expansion of this species have been identified (most historic sites have been found to contain habitat that is unsuitable for this species). However more effort should locate sites with winter flooding, short sward and some poaching (like the introduction site at North Hinksey). The plant does not seem to be restricted to species-rich well-established swards. Future prospects at Walthamstow Marshes focus around extension of the open area along the ditch where the plant occurs. Extension of grazing on the marshes may create further opportunities (S. Wightman, *pers comm.*).

Since *A. repens* occurs at such low numbers, the long-term viability of this species may be at risk. If environmental conditions change, there is a potential for it to become extinct.

4.1 Future prospects conclusion^{2,8}

Unfavourable – Inadequate

5. Overall Conclusion^{2,8}

Unfavourable – Bad but improving

Range and population were assessed as Unfavourable – Bad but improving; habitat and prospects were assessed as Unfavourable – Inadequate. Hence, in accordance with Annex C (where at least one ‘Bad’ judgment is bad) the overall conclusion is Unfavourable – Bad. However, to reflect the improvements in population and range since the Directive came into force, *A. repens* is also noted as improving.

Table 5.1 Summary of conclusions

Parameter	Judgement	Grounds for Judgement (in accordance with Annex C)	Reliability*
Range	Unfavourable – Bad but improving	Current range is more than 10% below favourable reference range. However, establishment at Walthamstow and a successful re-introduction show that range is improving.	1
Population	Unfavourable – Bad but improving	Current population is more than 25% below favourable reference population. However, population trends show an increase	1
Habitat	Unfavourable – Inadequate	Any other combination Habitat quality at extant sites is suitable for the species, however, habitat area is unlikely to be sufficiently large to ensure the long term survival of the species	3
Future Prospects	Unfavourable – Inadequate	Any other combination Because <i>A. repens</i> occurs at such low numbers, the long-term viability of this species may be at risk; if environmental conditions change, there is a potential for it to become extinct. Currently there are few realistic options for further expansion, and a number of threats.	3
Overall Assessment	Unfavourable – Bad but improving	One or more Unfavourable - Bad	1

*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

GOWING, D. & YOUNGS, E. 2005. The requirements of *Apium repens*: an ecohydrological assessment. *English Nature Internal report*.

MCDONALD, A.W. & LAMBRICK, C.R. 2006. *Apium repens* creeping marshwort; Species Recovery Programme 1995-2005. *English Nature Research Report No 706*.

ASHMOLEAN NATURAL HISTORY SOCIETY OF OXFORDSHIRE: *Annual monitoring reports* (1994-2006).

PRESTON, C.D., PEARMAN, D.A. & DINES, T.D. 2002. *New Atlas of the British & Irish Flora*. Oxford: Oxford University Press.

Map Data Sources

Rare Plants Group of the Ashmolean Natural History Society of Oxfordshire; B. Wurzell and D. Miller (Lee Valley Park Ranger) (*pers. comms.*).