



European Site Conservation Objectives: Supplementary Advice on Conserving and Restoring Site Features

Kennet and Lambourn Floodplain Special Area of Conservation (SAC)
Site code: UK0030044



Photo: Graham Steven

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About this document

This document provides Natural England's supplementary advice about the European Site Conservation Objectives relating to Kennet and Lambourn Floodplain SAC. This advice should therefore be read together with the SAC Conservation Objectives available [here](#).

Where this site overlaps with other European Site(s), you should also refer to the separate European Site Conservation Objectives and Supplementary Advice (where available) provided for those sites.

This advice replaces a draft version dated 21 September 2019 following receipt of comments from the site's stakeholders.

You should use the Conservation Objectives, this Supplementary Advice and any case-specific advice given by Natural England, when developing, proposing or assessing an activity, plan or project that may affect this site. Any proposals or operations which may affect the site or its qualifying features should be designed so they do not adversely affect any of the attributes listed in the objectives and supplementary advice.

This Supplementary Advice to the Conservation Objectives presents attributes which are ecological characteristics of the designated species and habitats within a site. The listed attributes are considered to be those that best describe the site's ecological integrity and which, if safeguarded, will enable achievement of the Conservation Objectives. Each attribute has a target which is either quantified or qualitative depending on the available evidence. The target identifies as far as possible the desired state to be achieved for the attribute.

The tables provided below bring together the findings of the best available scientific evidence relating to the site's qualifying features, which may be updated or supplemented in further publications from Natural England and other sources. The local evidence used in preparing this supplementary advice has been cited. The references to the national evidence used are available on request. Where evidence and references have not been indicated, Natural England has applied ecological knowledge and expert judgement. You may decide to use other additional sources of information.

In many cases, the attribute targets shown in the tables indicate whether the current objective is to 'maintain' or 'restore' the attribute. This is based on the best available information, including that gathered during monitoring of the feature's current condition. As new information on feature condition becomes available, this will be added so that the advice remains up to date.

The targets given for each attribute do not represent thresholds to assess the significance of any given impact in Habitats Regulations Assessments. You will need to assess this on a case-by-case basis using the most current information available.

Some, but not all, of these attributes can also be used for regular monitoring of the actual condition of the designated features. The attributes selected for monitoring the features, and the standards used to assess their condition, are listed in separate monitoring documents, which will be available from Natural England.

These tables do not give advice about SSSI features or other legally protected species which may also be present within the European Site.

If you have any comments or queries about this Supplementary Advice document please contact your local Natural England adviser or email HDIRConservationObjectivesNE@naturalengland.org.uk

About this site

European Site information

| | |
|--|---|
| Name of European Site | Kennet and Lambourn Floodplain Special Area of Conservation (SAC) |
| Location | Berkshire, Wiltshire |
| Site maps | The designated boundary of this site can be viewed here on the MAGIC website |
| Designation Date | 1 April 2005 |
| Qualifying Features | See section below |
| Designation Area | 114.47 hectares |
| Designation Changes | n/a |
| Feature Condition Status | Details of the feature condition assessments made at this site can be found using Natural England's Designated Sites System |
| Names of component Sites of Special Scientific Interest (SSSIs) | Kennet and Lambourn Floodplain SSSI, Boxford Water Meadows SSSI, Chilton Foliat Meadows SSSI, Thatcham Reed Beds SSSI |
| Relationship with other European or International Site designations | Parts of the site are immediately adjacent to, or overlap with, the River Lambourn SAC . |
| Further information | Natura 2000 Standard Data Form for Kennet and Lambourn Floodplain SAC |

Site background and geography

The Kennet and Lambourn Floodplain SAC is situated in the river valleys of the Lambourn and Kennet in the Berkshire and Marlborough Downs ([NE482](#)) and Thames Basin Heaths National Character Areas ([NE530](#)). The underlying geology is chalk.

The site is particularly important as it has a significant concentration of areas supporting a threatened species of snail - the Desmoulin's whorl snail *Vertigo moulinsiana*. This species inhabits permanently wet habitats, particularly riverside fen, sedge beds and swamps. Parts of the SAC are former water-meadows managed by extensive cattle grazing but most areas are fringing, riverside or ditch-side vegetation which receives little management intervention.

Part of the site is managed as a Local Nature Reserve with open public access.

About the qualifying features of the SAC

The following section gives you additional, site-specific information about this SAC's qualifying features. These are the natural habitats and/or species for which this SAC has been designated.

Qualifying habitats:

n/a

Qualifying Species:

- **S1016 Desmoulin's whorl snail *Vertigo moulinsiana***

Desmoulin's whorl snail *Vertigo moulinsiana* is the largest *Vertigo* species, with a shell height of up to 2.6 mm. It has a short lifespan, living for only 1 – 2 years, and populations may increase or decrease rapidly in size in relation to habitat suitability.



Above: *Vertigo moulinsiana* © Roger Key/English Nature

It is restricted to calcareous wetlands, usually bordering lakes or rivers, or in fens. High humidity appears to be important in determining local distribution within sites. It normally lives on reed-grasses and sedges, particularly reed sweet-grass *Glyceria maxima* and tussocks of greater pond-sedge *Carex riparia* and lesser pond-sedge *C. acutiformis*, where it feeds on the microflora, and in autumn it may ascend taller reeds and scrub. Like all Annex II *Vertigo* species, it is highly dependent on maintenance of existing local hydrological conditions.

The species appears to be somewhat opportunistic in that it can take advantage of 'new' patches of habitat which may form as a result of natural riverine processes or changes in land management. It appears to form 'meta-populations' of numerous small, or large, widely separated colonies over a wide geographical area.

The cluster of sites selected in the Kennet and Lambourn Floodplain SAC supports one of the most extensive known populations of Desmoulin's whorl snail in the UK and is one of two sites representing the species in the south-western part of its UK range in the important chalk stream habitat.

Desmoulin's whorl snail is widely distributed along the valleys of both the River Kennet between just downstream of Marlborough and to the east of Newbury, and on the River Lambourn between Welford and Newbury. The areas selected for inclusion in the SAC were, at the time of designation, the areas known to support particularly high populations of Desmoulin's whorl snail.

The supporting habitats are mostly dominated by lesser pond-sedge *Carex acutiformis*, greater pond-sedge *Carex riparia* or reed sweet-grass *Glyceria maxima* and are usually unshaded or partly shaded. The snail inhabits a particular 'zone' in the transition between truly aquatic habitat and terrestrial habitat where ground conditions are permanently wet and humid, but not subject to significant flooding or rapid

flow of surface water. The snail feeds on minute algae on the surface of leaves and over-winter in the leaf litter above the ground layer of peat. The areas of supporting habitat are all fed by calcareous or base-rich groundwater which appears to be an important factor in providing suitable environmental conditions.

Desmoulin's whorl snail populations are sensitive to changes in land management, particularly management neglect which results in increased shading due to an increase in scrub or tree cover, drainage of fens and lowering of the water table, increased grazing intensity or mowing of riverside vegetation for fishery management. The species may also be strongly susceptible to the effects of climate change. In particular, prolonged periods of exceptional flooding and high river flow rates may deplete colonies, and subsequent recovery may take many years if colonies are isolated.

Table 1: Supplementary Advice for Qualifying Features: S1016. *Vertigo moulinsiana*; Desmoulin`s whorl snail

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|------------------------------|---|---|---|
| Supporting processes (on which the feature and/or its supporting habitat relies) | Conservation measures | Implement those management measures (either within and/or outside the site boundary as appropriate) which are necessary to maintain the structure, functions and supporting processes associated with Desmoulin`s whorl snail and/or its supporting habitats. | <p>Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site. Maintenance of appropriate groundwater and surface water levels is particularly important.</p> <p>Habitats may become unsuitable by unsympathetic deepening of ditches, modification of river channels, removal of riverside vegetation, engineering of river banks and groundwater abstraction.</p> <p>The maintenance of predominantly open and unshaded habitat is also important as excessive shading often results in changes in the composition of the fen vegetation. Habitats should not be subject to intensive grazing, trampling or cutting which removes a high proportion of the leafy material of the plants on which the plant lives, or which prevents the accumulation of a dense layer of leaf litter at the base of plants. Extensive cattle grazing can be compatible with maintenance of suitable conditions where this is the traditional management regime but the introduction of grazing where it has not been previously carried out can render sites unsuitable for Desmoulin`s whorl snail.</p> <p>Further details about the necessary conservation measures for this site can be provided by contacting Natural England. This information will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, site management strategies or plans, the Views about Management Statement for the underpinning SSSI and/or management agreements.</p> | <p>DRAKE, C.M. 1998. A Review of the Status, Distribution and Habitat Requirements of <i>Vertigo moulinsiana</i> in England</p> <p>DRAKE CM (ed). (1997) <i>Vertigo moulinsiana</i> – Surveys and Studies Commissioned in 1995-1996. English Nature Research Report 217</p> <p>NATURAL ENGLAND, 2014. Site Improvement Plan: River Lambourn and Kennet-Lambourn Floodplain (SIP112)</p> |
| Supporting habitat: extent and distribution | Extent of supporting habitat | Maintain the total extent of the habitat(s) which support Desmoulin`s whorl snail at approximately 2.82 hectares | <p>Given the dynamic nature of the supporting habitat for Desmoulin`s whorl snail the baseline value given is the suitable or potentially suitable habitat to support Desmoulin`s whorl snail. This habitat extent is very much an estimate intended for guidance only.</p> <p>The objective of the target is to indicate that plans or projects should not result in the loss or degradation of any area of habitat known to support Desmoulin`s whorl snail in the SAC. This is necessary in order for the site to contribute towards the objective of achieving an overall favourable conservation status of the feature at a UK level.</p> <p>The information available on the extent and distribution of supporting habitat used by the feature is based on habitat surveys of varying age,</p> | <p>KILLEEN I.J. 1996. An Assessment of the Status and Distribution of the Terrestrial Pulmonate Snail <i>Vertigo moulinsiana</i> (Dupuy) at Thatcham Reed Beds SSSI) English Nature</p> <p>KILLEEN I.J. 1995. An Assessment of the Status and Distribution of the Terrestrial Pulmonate</p> |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|--|------------------------------------|---|---|--|
| | | | and may be subject to periodic review in light of natural changes in species distribution or as new information comes to light. | <p>Snail <i>Vertigo moulinsiana</i> (Dupuy) in the Kennet and Lambourn Valleys, Berkshire English Nature.</p> <p>KILLEEN I.J. 2011. A Condition Assessment of <i>Vertigo moulinsiana</i> in the Kennet and Lambourn SAC, Berkshire Natural England</p> <p>KILLEEN I.J. 2014. A Condition Assessment of <i>Vertigo moulinsiana</i> in the Kennet and Lambourn SAC, Berkshire. Natural England.</p> <p>KILLEEN I.J. 1996. A34 Newbury By-Pass Factual Report – Survey for the Snail <i>Vertigo moulinsiana</i> Highways Agency</p> |
| Supporting habitat: extent and distribution | Distribution of supporting habitat | Maintain the distribution and continuity of the Desmoulin`s whorl snail and its supporting habitat, including where applicable its component vegetation types and associated transitional vegetation types, across the site | <p>A contraction in the range, or geographic spread, of the feature (and its component vegetation) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes.</p> <p>Contraction may also reduce and break up the continuity of a habitat within a site and how well the species feature is able to occupy and use habitat within the site. Habitat connectivity is particularly important for the survival of this species as it allows colonies to adapt to changing environmental conditions.</p> | |
| Supporting processes | Adaptation and resilience | Maintain the feature's ability, and that of its supporting habitat, to | This recognises the increasing requirement for supporting habitat features to absorb or adapt to wider environmental changes. Resilience | NATURAL ENGLAND, 2015. Climate Change |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|--|---------------------------------------|--|---|--|
| (on which the feature and/or its supporting habitat relies) | | adapt or evolve to wider environmental change, either within or external to the site | <p>may be described as the ability of an ecological system to cope with, and adapt to environmental stress and change whilst retaining the same basic structure and ways of functioning. Such environmental changes may include river levels, river flow rates, unseasonal flooding and ambient temperature for example, which are likely to affect the extent, distribution, composition and functioning of a feature within a site.</p> <p>The vulnerability and response of features to such changes will vary. Using best available information, any necessary or likely adaptation or adjustment by the feature and its management in response to actual or expected climatic change should be allowed for, as far as practicable, in order to ensure the feature's long-term viability.</p> <p>The overall vulnerability of this particular SAC to climate change has been assessed by Natural England as <i>high</i>, taking into account the sensitivity, fragmentation, topography and management of its habitats/supporting habitats. These sites are considered to be the most vulnerable sites overall and are likely to require the most adaptation action, most urgently. This means that action to address specific issues is likely, such as reducing habitat fragmentation, creating more habitat to buffer the site or expand the habitat into more varied landscapes and addressing particular management and condition issues. Individual species may be more or less vulnerable than their habitat itself. In many cases, change will be inevitable so appropriate monitoring would be required.</p> | Theme Plan and supporting National Biodiversity Climate Change Vulnerability Assessments (NBCCVAs) for SACs and SPAs in England Available at http://publications.naturalengland.org.uk/publication/4954594591375360 . |
| Supporting habitat: structure/function | Soils, substrate and nutrient cycling | Maintain the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status and fungal:bacterial ratio, within typical values for the supporting habitat | <p>Soil supports basic ecosystem function and is a vital part of the natural environment. Its properties strongly influence the colonisation, growth and distribution of those plant species which together form vegetation types, and therefore provides a habitat used by a wide range of organisms. Soil biodiversity has a vital role to recycle organic matter.</p> <p>Changes to natural soil properties may therefore affect the ecological structure, function and processes associated with the supporting habitat of this Annex II feature. This can include:</p> <ul style="list-style-type: none"> • Changes in land use – for example, from rough pasture or meadow to improved grassland. | Killeen. I.J. 2003. <i>Ecology of Desmoulin's Whorl Snail</i> . Conserving Natura 2000 Rivers Ecology Series No. 6. English Nature, Peterborough. |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|------------------------|---|---|---|
| | | | <ul style="list-style-type: none"> • Encroachment by scrub or alien plant species, which may result in too much shade and/or drying out of the habitat and soil. • Intensive grazing or excessive poaching of ditch margins. | |
| Supporting processes (on which the feature and/or its supporting habitat relies) | Water quantity/quality | Maintain (or restore where appropriate) water quality and quantity to a standard which provides the necessary conditions to support Desmoulin's whorl snail | <p>This feature is dependent on wetland habitats supported by surface and/or ground water, and maintaining the quality and quantity of water supply will be critical, especially at certain times of year. Poor water quality and inadequate quantities of water can adversely affect the structure and function of this habitat type.</p> <p>Typically, meeting the surface water and groundwater environmental standards set out by the Water Framework Directive (WFD 2000/60/EC) will also be sufficient to support the achievement of SAC Conservation Objectives but in some cases more stringent standards may be needed to reflect the ecological needs of the species feature.</p> <p>For example, the quantity of molluscicides in river water may affect Desmoulin's whorl snail at certain stages of its life cycle but this requires further investigation. Prolonged summer flooding of supporting habitat, very high flow rates in winter and chronic reduction in groundwater levels can all have serious impacts on habitat suitability for Desmoulin's whorl snail.</p> | NATURAL ENGLAND, 2014. River Lambourn: Proposed targets for SAC conservation objectives (based on revised Common Standards Guidance) and interim progress goals for uRBMP (RIVPDF112) |
| | Air quality | Maintain or, where necessary, restore concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk). | <p>The supporting habitat of this feature is considered sensitive to changes in air quality.</p> <p>Exceedance of critical values for air pollutants may modify the chemical status of a habitat's substrate, accelerating or damaging plant growth, altering its vegetation structure and composition (including food-plants) and reducing supporting habitat quality and population viability of this feature.</p> <p>Critical Loads and Levels are recognised thresholds below which such harmful effects on sensitive UK habitats will not occur to a significant level, according to current levels of scientific understanding. There are critical levels for ammonia (NH3), oxides of nitrogen (NOx) and sulphur dioxide (SO2), and critical loads for nutrient nitrogen deposition and acid deposition. There are currently no critical loads or levels for other pollutants such as Halogens, Heavy Metals, POPs, VOCs or Dusts.</p> | |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|--|--|--|
| | | | <p>These should be considered as appropriate on a case-by-case basis. Ground level ozone is regionally important as a toxic air pollutant but flux-based critical levels for the protection of semi-natural habitats are still under development.</p> <p>It is recognised that achieving this target may be subject to the development, availability and effectiveness of abatement technology and measures to tackle diffuse air pollution, within realistic timescales.</p> | |
| Supporting habitat: structure/function | Vegetation structure | Maintain dense stands of tall vegetation, which is typically >70cm tall by August, with an abundance of tussocks and decaying leaf litter. | <p>High humidity is important to all whorl snails (<i>Vertigo</i> spp.) and the different species achieve their requirements by occupying different levels (i.e. vertical movement) within their microhabitats.</p> <p>Desmoulin's whorl snail is a climbing species on emergent vegetation, living over a large vertical range at different times of year. The snail over-winters in the lower levels of vegetation, within tussocks or in amongst decaying layer of leaf litter. In the Kennet and Lambourn valleys the species is strongly associated with tall, bulky marginal plants such as <i>Glyceria maxima</i>, <i>Carex acutiformis</i>, <i>Carex paniculata</i> and <i>Carex riparia</i> and more rarely <i>Phragmites communis</i>.</p> <p>Favoured areas of habitat are usually associated with riversides, marshy hollows in former water carriers or ditches, areas of low lying swamp. These areas are mostly open or subject to dappled shade.</p> | |
| Supporting habitat: structure/function | Vegetation composition - invasive non-native plants | Ensure invasive non-native plants are either rare or absent within the site | <p>Desmoulin's whorl snails are potentially or actually at risk from non-native invasive plants. Such plants are considered a major threat to habitat due to their rapid growth and dominance over native species and the difficulty of controlling them.</p> <p>Species of concern include Japanese knotweed <i>Fallopia japonica</i>, Himalayan [Indian] balsam <i>Impatiens glandulifera</i> and giant hogweed <i>Heracleum mantegazzianum</i>. These plants may directly alter the composition of Desmoulin's whorl snail habitat by replacing preferred species and increasing shading.</p> | |
| | Ground moisture | Maintain appropriate soil/ground moisture conditions so that water levels are continuously at or just above the ground surface | <p>High groundwater levels throughout the year are one of the most important factors influencing the distribution of Desmoulin's whorl snail.</p> <p>The water level must remain close to the surface so that the ground</p> | KILLEEN, I.J. & MOORKENS, E.A. 2003. Monitoring Desmoulin's Whorl Snail <i>Vertigo</i> |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|----------------------------------|---|--|--|
| | | throughout the year. | remains at least moist for most of the summer, although some seasonal drying appears to be acceptable. Relatively high groundwater also contributes to maintaining a high humidity in the vegetation. The optimal degree of ground moisture for this feature is usually measured as 3 using a version of the '5 Point Wetness scale' (Killeen & Moorkens 2003), ie "wet, water rises under pressure". | <i>mouliniana</i> Conserving Natura 2000 Rivers Monitoring Series No. 6 English Nature |
| Supporting processes (on which the feature and/or its supporting habitat relies) | Mosaic of habitat on floodplains | Maintain the extent and patterning of in-channel and riparian habitats which are characteristic of natural fluvial processes, and the connectivity between river and floodplain habitats. | <p>Watercourses with a high degree of naturalness shaped by dynamic fluvial processes produce a mosaic of characteristic physical features and habitats, including those that are important to Desmoulin's whorl snail.</p> <p>A range of physical habitat modifications to rivers (such as channel straightening, widening and deepening, bankside and bed protection, close flood banks and impoundments) can disconnect them from their floodplain, resulting in a disjointed distributions of suitable habitat for Desmoulin's whorl snail.</p> <p>Rivers that have sections that are already significantly physically modified should be subject to a process for planning and implementing physical restoration measures (a river restoration plan). This should seek to restore natural geomorphological processes (including where possible restoration of continuity between river and floodplain) as far as possible whilst working within the practical constraints of essential flood protection for people and the built environment. In certain instances, sections of river channel may lie outside the boundary of the site, but may still be integral to how the site functions</p> | |
| Population (of the feature) | Abundance | Maintain a healthy adult:juvenile structure and population density (at typically >250 individuals per m ² in late summer), whilst avoiding deterioration from current levels as indicated by the latest peak count or equivalent | <p>Maintenance of a viable meta-population is a fundamental requirement to ensure this feature has a Favourable Conservation Status across its natural range in the UK.</p> <p>Due to the dynamic nature of Desmoulin's whorl snail populations, the target-value given for the population size or presence of this feature is considered to be the <i>minimum</i> standard for conservation/restoration measures to achieve. This value may be revised where there is evidence to show that a population's size or presence has significantly changed as a result of natural factors or management measures and has been stable at a new level over a considerable period. The value</p> | KILLEEN, I.J. & MOORKENS, E. A. 2003. Monitoring Desmoulin's Whorl Snail <i>Vertigo mouliniana</i> Conserving Natura 2000 Rivers Monitoring Series No. 6 English Nature |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|--|--|---------|---|--|
| | | | <p>given here may be updated to reflect any strategic objectives which may be set at a national level for this feature.</p> <p>Given the likely fluctuations in numbers over time, any impact-assessments should focus on the current size of the site's population, as derived from the latest known or estimated level established using the best available data. This advice accords with the obligation to avoid deterioration of the site or significant disturbance of the species for which the site is designated, and seeks to avoid plans or projects that may affect the site giving rise to the risk of deterioration. Similarly, where there is evidence to show that a feature has historically been more abundant than the stated minimum target and its current level, the ongoing capacity of the site to accommodate the feature at such higher levels in future should also be taken into account in any assessment.</p> <p>Unless otherwise stated, the population size or presence will be that measured using standard methods. Plastic tray sampling or white sheet beating surfaces are typically used as sample points in wetlands for assessments of this species.</p> <p>This value is also provided recognising there will be inherent variability as a result of natural fluctuations and margins of error during data collection. Whilst we will endeavour to keep these values as up to date as possible, local Natural England staff can advise that the figures stated are the best available.</p> <p>The dynamic nature of this population on site, results in large natural fluctuations, and although this species has an optimal population density there is considerable yearly variation. It is expected that population distribution and abundance may change as a consequence of changes in the natural river processes, habitat character, climate change and natural population fluctuations, Therefore, the abundance and distribution of this species on site should be monitored over multiple years.</p> | |
| <p>Version Control Advice last updated: 21st February 2019 – Stakeholder comments - Extent of supporting habitat attribute, supporting and explanatory notes expanded to clarify suitable habitat; Soils, substrate and nutrient cycling attribute, some further threats to the soil / habitat condition added within the supporting and explanatory notes and within the Abundance attribute further clarification added on dynamic population and distribution.</p> | | | | |

| Attributes | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|--|---------|----------------------------------|--|
| <p>Variations from national feature-framework of integrity-guidance: Attributes relating to '<i>river flow rate</i>' and '<i>populations upstream of the SAC</i>' are not considered relevant to most locations in this SAC.</p> | | | |