



European Site Conservation Objectives: Supplementary advice on conserving and restoring site features

**Stodmarsh Special Area of Conservation (SAC)
Site code: UK0030283**



Date of Publication: 21 March 2019

About this document

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

Where this site overlaps with other European Sites, 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 24 January 2019 following the 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.

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	Stodmarsh Special Area of Conservation (SAC)
Location	Kent
Site Map	The designated boundary of this site can be viewed here on the MAGIC website
Designation Date	14 June 2005
Qualifying Features	<i>See section below</i>
Designation Area	564.64 hectares
Designation Changes	NA
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)	Stodmarsh SSSI
Relationship with other European or International Site designations	Stodmarsh SPA ; Stodmarsh Ramsar.

Site background and geography

Covering a total area of 563.27 hectares, Stodmarsh is Marshland habitat with open water (ditches), a rare plant assemblage, neutral grassland, breeding and wintering birds. Situated in North-east Kent roughly 250 m north east of Stodmarsh Village and 3.3 km east of Sturry. The site is situated with the North Kent Plain National Character Area (NCA), which is the strip of land between the Thames Estuary to the north and the chalk of the Kent Downs to the south. The area is open, low and gently undulating. It is a very productive agricultural area with predominantly high-quality, fertile loam soils characterised by arable use. More information on this NCA can be found [here](#).

About the qualifying features of the SAC

Stodmarsh is classified as an SAC for the presence of Desmoulin's whorl snail (*Vertigo moulinsiana*). A sizeable population of Desmoulin's whorl snail *Vertigo moulinsiana* lives beside ditches within pasture on the floodplain of the River Stour, where reed sweet-grass *Glyceria maxima*, large sedges *Carex* spp. and sometimes common reed *Phragmites australis* dominate the vegetation. Stodmarsh is a south-eastern outlier of the main swathe of sites and is important in confirming the role of underlying base-rich rock (chalk) as a factor determining this species' distribution.

As part of "The Improvement Programme for England's Natura 2000 Sites" supported by EU LIFE+. 41 sample sites were re-examined at Westbere Marshes, Kent, these were sites where *Vertigo moulinsiana* was found to be present in 2011. The 2014 surveys confirmed the presence of the snail. The surveys revealed the loss of *V. moulinsiana* populations from 17 sample sites since last surveyed in 2010.

Qualifying Species:

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

Desmoulin's whorl snail is the largest species in the *Vertigo* genus, with a shell height up to about 2.6 mm. 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, such as 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.



Vertigo moulinsiana

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)
Population (of the feature)	Abundance	Restore a healthy adult: juvenile structure and population density (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>This will ensure there is a viable population of the feature which is being maintained at or increased to a level that contributes as appropriate to its Favourable Conservation Status across its natural range in the UK.</p> <p>Due to the dynamic nature of population change, the target-value given for the population size or presence of this feature is considered to be the minimum standard for conservation/restoration measures to achieve. This minimum-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 or above a new level over a considerable period. The values given here may also be updated in future 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>	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			Site-specific surveys, condition and/or other monitoring data indicates that this species could be assigned to both fen and ditch habitats. Included in the fen habitat as it best fits with it.	
Population (of the feature)	Connectivity with other populations	Restore the abundance and supporting habitat of Desmoulins whorl snail upstream of the SAC and the connectivity between populations	<p>This recognises population vulnerability of the top-most population to localised extinction; it remains likely that colonies are moved in flood events to downstream sites, so loss of headstream populations weakens the opportunities to overcome localised extinction events further downstream.</p> <p>When estimating population size across the habitat, be aware of comparing counts between months as higher counts will be made late summer/early autumn when juveniles are around. The juveniles are usually only recorded late summer – early autumn</p>	
Supporting habitat: extent and distribution	Distribution of supporting habitat	Maintain the distribution and continuity of the feature and its supporting habitat, including where applicable its component vegetation types.	<p>This target has been included because a contraction in the range of hydrology supporting habitat. The species feature is unable to occupy and use habitat within the site that suffers drought conditions. Areas that have a greater amount of open edge habitat which will differ in the amount of light, temperature and wind may lead to conditions not suitable for this feature and this may affect its viability.</p> <p>Map 2 details that the Desmoulin's whorl snail occurs with the site on emergent vegetation in fen areas and along ditches in the grazing marsh, both of which are notified habitats. Currently the species only occurs in the noted Units though suitable habitat occurs more widely within the SSSI. Survey work undertaken by outlines the broad areas the snail has been recorded but is not in sufficient detail to specify an area of suitable habitat.</p>	Killean I J (2003) Ecology of Desmoulin's Whorl Snail <i>Vertigo moulinsiana</i> . An English Nature Publication. Available here
Supporting habitat: extent and distribution	Extent of supporting habitat	<p>Maintain the extent of habitats which supports the feature;</p> <ul style="list-style-type: none"> • Inland water bodies (Standing water, Running water) (38%) • Bogs, Marshes, Water fringed vegetation, Fens (50%) • Heath, Scrub, Maquis and Garrigue, Phygrana (6%) • Broad-leaved deciduous 	<p>In order to contribute towards the objective of achieving an overall favourable conservation status of the feature at a UK level, it is important to maintain or if appropriate restore the extent of supporting habitats and their range within this SAC.</p> <p>The information available on the extent and distribution of supporting habitat used by the feature may be approximate depending on the nature, age and accuracy of data collection, and may be subject to periodic review in light of improvements in data. The habitats known or likely to support the feature at this SAC are: flooded marsh that remains wet. Mixed sward on site with <i>Glyceria maxima</i>, <i>Carex riparia</i> and <i>Phalaris arundinacea</i>.</p>	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		woodland (1%) <ul style="list-style-type: none"> Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites) (5%) 	Maintain population extent within current range in Units 1, 3 and 4, as demonstrated in Map 1. Approx. 20 hectares of fen/reed and approximately 3.2 km of ditches. Desmoulin's whorl snail have be included under the fen heading as being most appropriate habitat.	
Supporting habitat: structure function	Ground moisture	Restore appropriate soil/ground moisture conditions so that water levels are continuously at or just above the ground surface throughout the year.	<p>High groundwater levels throughout the year are considered to be one of the most important factors influencing the distribution of Desmoulin's whorl snail. For this feature the water level must remain close to the surface so that the ground 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 2 or 3 using a version of the '5 Point Wetness scale'</p> <p>Ground moisture levels between 30-90% across the whole site should be damp, wet or very wet. If assessment being confined to the wetland area then >80% should record damp, wet or very wet.</p> <p>The optimum condition is 'wet', i.e. water appears when the ground is slightly pressed. The snail prefers water at ground level or above all year round.</p> <p>There should be at least sufficient edge habitats where it is damp, wet or very wet i.e. at least 30-70% of the edge habitat. In the drier months the isolated damp areas should be at least interlinked by at least one annual flooding episode.</p>	Killeen I J & Moorkens E A (2003) Monitoring Desmoulin's Whorl Snail. An English Nature publication. Available here
Supporting habitat: structure /function	Vegetation structure	Maintain dense stands of tall vegetation, which is typically >70cms tall by August, with an abundance of tussocks and decaying leaf litter.	<p>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. Desmoulin's whorl snail is a climbing species on emergent vegetation, living over a large vertical range at different times of year.</p> <p>The snail may over-winter in the lower levels of vegetation, within tussocks or in amongst decaying layer of leaf litter and vegetation. Associated supporting vegetation is usually tall, bulky marginal plants such as <i>Glyceria</i>, <i>Carex</i>, <i>Cladium</i>, <i>Sparganium</i> & <i>Iris</i>. Supporting habitat is typically tall herb swamp and fen communities such as NVC</p>	Site-specific surveys, condition and monitoring data of Annex II <i>Vertigo</i> species. Data may be available from Natural England on request

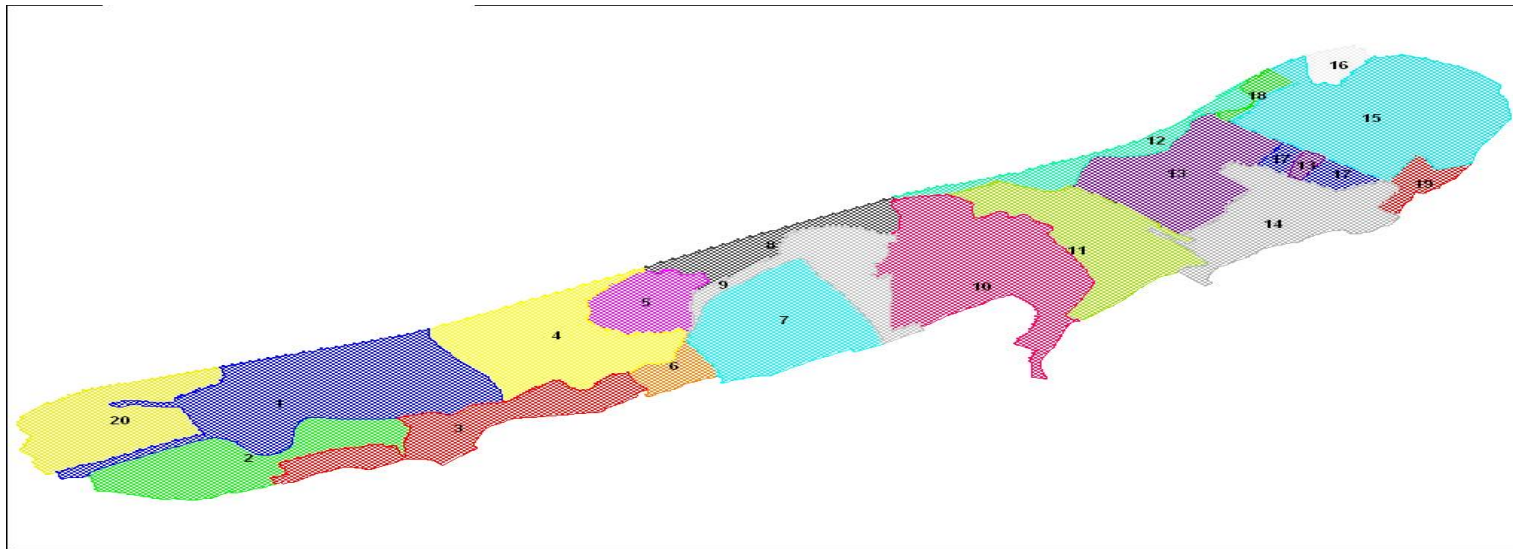
Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			types S7, S5, S2, S3 & S6 NVC communities, but also in stands with <i>Phragmites</i> . Drift into communities such as S26, especially with strong <i>Urtica</i> populations, which can signal undesirable ground drying.	
Supporting habitat: structure/function	Vegetation composition - invasive non-native plants	Ensure invasive non-native plants are either rare or absent within the site	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. 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 riparian plants may directly alter the composition of Desmoulin's whorl snail habitat by replacing preferred species and increasing shading. <i>Crassula helmsii</i> is present on site; submerged, emergent and terrestrial. Due to the plants ability to displace other vegetation this could impact on the Desmoulin's whorl snails.	Natural England (2014) Stodmarsh SAC Site Improvement Plan. Available from: http://publications.naturalengland.org.uk/publication/5749196032311296
Supporting processes (on which the feature and/or its supporting habitat relies)	Adaptation and resilience	Restore the feature's ability, and that of its supporting habitat, to adapt or evolve to wider environmental change.	The overall vulnerability of this SAC to climate change has been assessed by Natural England (2015) as being high, taking into account the sensitivity, fragmentation, topography and management of its habitats. This means that this site is considered to be the most vulnerable sites overall and are likely to require the most adaptation action, most urgently. A site based assessment should be carried out as a priority. 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 advisable.	NATURAL ENGLAND, 2015. Climate Change 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 processes (on which the feature and/or its supporting habitat relies)	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).	The supporting habitat of this feature is considered sensitive to changes in air quality. Exceedance of these critical values for air pollutants may modify the chemical status of its 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. 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	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>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. 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 processes (on which the feature and/or its supporting habitat relies)	Conservation measures	Maintain management or other measures (within and/or outside the site boundary as appropriate) necessary to maintain or restore the feature and/or its supporting habitats	<p>Active and ongoing conservation management is needed to protect and maintain the <i>Vertigo moulinsiana</i> at this site.</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>Site-specific surveys, condition and monitoring data of Annex II <i>Vertigo</i> species. Data may be available from Natural England on request</p> <p>English Nature (2005) Stodmarsh SSSI, Views About Management</p> <p>Natural England (2014) Stodmarsh SAC Site Improvement Plan. Available from: http://publications.naturalengland.org.uk/publication/5749196032311296</p>
Supporting processes (on which the feature and/or its supporting habitat relies)	Mosaic of biotopes on floodplains	Restore the extent and patterning of In-channel and riparian biotopes which are characteristic of natural fluvial processes.	Watercourses with a high degree of naturalness are governed by dynamic processes which result in a mosaic of characteristic physical features and habitats (or 'biotopes'), including a range that are important to Desmoulin's Whorl Snail. A range of physical habitat modifications to rivers (such as channel straightening, widening and deepening, bankside and bed protection, close floodbanks and impoundments) can disconnect them from their floodplain, resulting in disjointed distributions of suitable habitat for Desmoulin's Whorl Snail. Rivers that have sections that are already significantly physically modified should be subject to a process for planning and implementing	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>physical restoration measures. This should be based on restoring natural geomorphological processes (including where possible restoration of continuity between river and floodplain) as far as possible to allow restoration of characteristic and sustainable biotope mosaics, 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> <p>There are some flushes along the northern side of the site where water flows in from the high ground. Open water at Stodmarsh is generally artificial to a lesser or greater extent. At the Fordwhich (western) end the lakes were formed by gravel extraction. In the centre of the SSSI, the lakes are thought to be caused by mining subsidence.</p>	
Supporting processes (on which the feature and/or its supporting habitat relies)	Water quantity/ quality	Maintain the quality of waters within the site as indicated by the presence of an abundant and diverse invertebrate community and meet the lake water quality targets ensuring a base rich supply of water.	<p>For many SAC features which are dependent on wetland habitats supported by surface and/or ground water, 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. The targets for the lakes have been agreed nationally and are set to high ecological status equivalent for chlorophyll a and then good ecological status for the lakes with total phosphorous targets of 49 micrograms per litre and total nitrogen of 1.5mg/l Meeting these targets will ensure the water quality targets. This species only occurs on habitats with an adequate base rich supply.</p> <p>Open water consists of a number of large lakes and smaller pools, 130⁴ hectares of open water and 43⁵ kilometres of ditches made up by: Westbere Lake, Hersden Lake, Collards Lagoon, Trenley Lake, Trout Pool, Pluckstone Pool and the NNR lake. The NNR lake fluctuating water level is controlled on site and contains a currently unmeasured fish population. The ditch network is extensive within the grazing marsh system and also within the reedbed and fen areas which is another notified habitat.</p>	<p>Site-specific surveys, condition and monitoring data of Annex II Vertigo species. Data may be available from Natural England on request</p> <p>Natural England (2014) Stodmarsh SAC Site Improvement Plan. Available from: http://publications.naturalengland.org.uk/publication/5749196032311296</p>
Supporting processes (on which the feature and/or its supporting	Water supply (rivers and streams (see also groundwater)	Restore adequate water supply of base rich (chalk) water to ensure near surface water levels can be maintained throughout the site in pastures (see also	The Great Stour, though tidal is not currently saline this far up the river though that will change with climate change and the bulk of the ditch system (that on the NNR) is currently separately fed by the Lampen Stream (a chalk stream) though it has historically and periodically required water from the main river Stour and is thus also wholly	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
habitat relies)		groundwater) and on lake edges.	freshwater. The Desmoulin's whorl snail also occurs in the grazing marshes ditches to the south of the river, shown in Unit 3 and not just in the fen units 1 and 4 of Map 1 and the SAC Standard data form lists the lake habitat, its edges, the marsh and fen as the underlying habitat feature. .	
Variations from national feature-framework of integrity-guidance: n/a				
Version Control Advice last updated 18th February 2019 . Following NE specialist comments changes to water quantity/quality attribute text which includes agreed targets for total phosphorus and text added/changed to water supply attribute to highlight restoration of adequate water supply of base-rich (chalk) water to ensure near surface water levels which are to be maintained throughout.				

Map 1 ENSIS recording units



Map 2 – Habitats (light green - grazing marsh, dark green - fen, yellow - reedbed, red – open water)

