



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

**Pasturefields Salt Marsh Special Area of Conservation (SAC)  
Site Code: UK0012789**



**Date of Publication: 26 March 2018**

## **About this document**

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

**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](mailto:HDIRConservationObjectivesNE@naturalengland.org.uk)**

## About this site

### European Site information

<b>Name of European Site</b>	Pasturefields Salt Marsh Special Area of Conservation (SAC)
<b>Location</b>	Staffordshire
<b>Site Maps</b>	The designated boundary of this site can be viewed <a href="#">here</a> on the MAGIC website
<b>Designation Date</b>	1 <sup>st</sup> April 2005
<b>Qualifying Features</b>	See section below
<b>Designation Area</b>	7.70 ha
<b>Designation Changes</b>	N/A
<b>Feature Condition Status</b>	Details of the feature condition assessments made at this site can be found using Natural England's <a href="#">Designated Sites System</a>
<b>Names of component Sites of Special Scientific Interest (SSSIs)</b>	<a href="#">Pasturefields Saltmarsh SSSI</a>
<b>Relationship with other European or International Site designations</b>	N/A

### Site background and geography

Pasturefields Salt Marsh SAC is a remnant of the former saltmarshes of the Trent Valley, once exploited for brine extraction. This saltmarsh still has two old brine wells, fed by naturally saline (salt-rich) water seeping up from deep underground.

The site lies within the [Needwood and South Derbyshire Claylands National Character Area](#) (NCA), a predominately rolling plateau that slopes from the southern edge of the Peak District to the valley of the River Trent in the south-west.

Despite its small size, it contains an unusual variety of halophytic (salt tolerant) plants which are usually found in more saline coastal habitats. These include common saltmarsh-grass *Puccinellia maritima*, lesser sea-spurrey *Spergularia marina*, saltmarsh rush *Juncus gerardii* and sea arrowgrass *Triglochin maritimum*.

The site is also locally important for breeding birds associated with lowland wet grassland including snipe, redshank and lapwing.

The site is managed as a nature reserve by the [Staffordshire Wildlife Trust](#).

## 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:

- **H1340. Inland salt meadows\* (priority feature); 'Inland saltmarshes'**

This habitat type refers to non-coastal sites supporting saltmarsh vegetation. In the UK this vegetation typically corresponds to the NVC types SM16 *Festuca rubra* salt-marsh community and SM23 *Spergularia marina* – *Puccinellia distans* salt-marsh community.

The Annex I type comprises anthropogenic or man-made stands found, for example, in former salt-working sites, as well as natural or near-natural forms.

Inland salt meadows are a rare habitat type, having declined dramatically in the past 50 years in all areas where it occurs. The destruction of much of the natural habitat can be traced back to early salt-production activities.

Pasturefields Salt Marsh in the West Midlands is the only known remaining example in the UK of a natural salt spring with inland saltmarsh vegetation. The vegetation consists of red fescue *Festuca rubra*, with common saltmarsh-grass *Puccinellia maritima*, lesser sea-spurrey *Spergularia marina*, saltmarsh rush *Juncus gerardii* and sea arrow-grass *Triglochin maritimum* in the most saline situations.

**Table 1: Supplementary Advice for Qualifying Features: H1340. Inland salt meadows; Inland saltmarshes \***

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
<b>Extent and distribution of the feature</b>	<b>Extent of the feature within the site</b>	Maintain the total extent of the H1340 feature at 1 ha.	<p>There should be no measurable net reduction (excluding any trivial loss) in the extent and area of this feature, and in some cases, the full extent of the feature may need to be restored.</p> <p>The baseline-value of extent given has been generated using data gathered from the listed site-based surveys. Area measurements given may be approximate depending on the methods, age and accuracy of data collection, and as a result this value may be updated in future to reflect more accurate information. The extent of an Annex I habitat feature covers the sum extent of all of the component vegetation communities present and may include transitions and mosaics with other closely-associated habitat features. Where a feature is susceptible to natural dynamic processes, there may be acceptable variations in its extent through natural fluctuations.</p> <p>At this SAC, the H1340 feature forms only a small part of the designated site, with remainder consisting of wet neutral semi-improved grassland habitat.</p>	LAWLEY, S. (1993) Pasture Fields Management Plan. Staffordshire Wildlife Trust.
	<b>Spatial distribution of the feature within the site</b>	Maintain the distribution and configuration of the H1340 feature, including where applicable its component vegetation types, across the site	<p>Distribution includes the spatial pattern or arrangement of this habitat feature, and its component vegetation types, across the site.</p> <p>Changes in distribution may affect the nature and range of the vegetation communities present, the operation of the physical, chemical, and biological processes in the system and the resiliency of the site and its features to changes or impacts.</p>	LAWLEY, S. (1993) Pasture Fields Management Plan. Staffordshire Wildlife Trust.
<b>Structure and function (including its typical species)</b>	<b>Vegetation community composition</b>	<p>Ensure the component vegetation communities of the H1340 feature are broadly referable to and characterised by the following National Vegetation Classification type(s);</p> <p>SM16 <i>Festuca rubra</i> salt-marsh community</p>	<p>This habitat feature will comprise a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and drainage) and vegetation management. In the UK these have been categorised by the National Vegetation Classification (NVC).</p> <p>Maintaining or restoring these characteristic and distinctive vegetation types, and the range of types as appropriate, will be important to sustaining the overall habitat feature. This will also help to conserve their typical plant species (i.e. the constant and preferential species of a community), and therefore that of the SAC feature, at appropriate levels (recognising natural fluctuations).</p> <p>The salt-marsh vegetation types comprising the H1340 feature occur within the site</p>	<p>LAWLEY, S. (1993) Pasture Fields Management Plan. Staffordshire Wildlife Trust.</p> <p>MIDDLEMARCH ENVIRONMENTAL (2002) Pasture Fields Hydro-ecological Monitoring Report</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		SM23 <i>Spergularia marina</i> – <i>Puccinellia distans</i> salt-marsh community	along with other communities of wet neutral semi-improved grassland (generally a mosaic of MG10, MG9 and MG6 grassland and rush-pasture).	
<b>Structure and function (including its typical species)</b>	<b>Key structural, influential and/or distinctive species</b>	<p>Restore the abundance of the species listed below to enable each of them to be a viable component of the Annex 1 habitat;</p> <p><i>Puccinellia maritima</i>, <i>Plantago maritima</i>, <i>Spergularia marina</i>, <i>Suaeda maritima</i>, <i>Festuca rubra</i>, <i>Juncus gerardii</i>, <i>Armeria maritima</i>, <i>Agrostis stolonifera</i>, <i>Glaux maritima</i>, <i>Triglochin maritima</i>, <i>Leontodon autumnalis</i></p>	<p>Some plant or animal species (or related groups of such species) make a particularly important contribution to the structure, function and/or quality of an Annex I habitat feature at a particular site. These species will include;</p> <ul style="list-style-type: none"> <li>– <i>Structural</i> species which form a key part of the habitat's structure or help to define an Annex I habitat on a site (see also the attribute for 'vegetation community composition').</li> <li>– <i>Influential</i> species which are likely to have a key role affecting the structure and function of the habitat (such as bioturbators (mixers of soil/sediment), grazers, surface borers, predators or other species with a significant functional role linked to the habitat).</li> <li>– <i>Site-distinctive</i> species which are considered to be a particularly special and distinguishing component of an Annex I habitat on a particular site.</li> </ul> <p>There may be natural fluctuations in the frequency and cover of each of these species. The relative contribution made by them to the overall ecological integrity of a site may vary, and Natural England will provide bespoke advice on this as necessary.</p> <p>The list of species given here for this Annex I habitat feature at this SAC is not necessarily exhaustive. The list may evolve, and species may be added or deleted, as new information about this site becomes available.</p>	<p>LAWLEY, S. (1993) Pasture Fields Management Plan. Staffordshire Wildlife Trust.</p> <p>MIDDLEMARCH ENVIRONMENTAL (2002) Pasture Fields hydro-ecological Monitoring Report</p> <p>Botanical Surveys: HAYES (1980) STEVENSON (1985) HILL (1992) HILLMAN (1993) Available from Natural England on request.</p> <p>NATURAL ENGLAND. SSSI condition assessments. (See <a href="#">Natural England's Designated Sites System</a>)</p>
<b>Structure and function</b>	<b>Vegetation: undesirable</b>	Maintain the frequency/cover of the	Undesirable non-woody and woody vascular plants species may require active management to avert an unwanted succession to a different and less desirable state.	NATURAL ENGLAND, 2013.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
(including its typical species)	species	<p>following undesirable species within acceptable levels and prevent changes in surface condition, soils, nutrient levels or hydrology which may encourage their spread:</p> <p><i>Deschampsia cespitosa</i>, large <i>Carex</i> spp. (leaves more than 5mm wide) e.g. <i>Carex acutiformis</i>, large grasses (leaves more than 10mm wide, stout stems) i.e. <i>Glyceria maxima</i>, <i>Phalaris arundinacea</i>, <i>Phragmites australis</i> <i>Cirsium arvense</i>, <i>Cirsium vulgare</i>, <i>Rumex crispus</i>, <i>Rumex obtusifolius</i>, <i>Urtica dioica</i> and <i>Senecio</i> spp</p>	<p>Often they may be indicative of a negative trend relating to another aspect of a site's structure and function. These species will vary depending on the nature of the particular feature, and in some cases these species may be natural/acceptable components or even dominants.</p>	<p>Definitions of Favourable Condition for designated features of interest: Pasturefields SSSI. Available from Natural England on request.</p>
Structure and function (including its typical species)	Soils, substrate and nutrient cycling	<p>Maintain the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status and fungal/bacterial ratio, to within typical values for the H1340 habitat.</p>	<p>Soil is the foundation of basic ecosystem function and 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 this Annex I feature.</p>	<p>MIDDLEMARCH ENVIRONMENTAL (2002) Pasture Fields Hydro-ecological Monitoring Report</p> <p>ASPINWALL AND COMPANY (1995) NRA9STW) hydrological Assessment of</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
				SSSI: Pasturefields Saltmarsh  MIDDLEMARCH ENVIRONMENTAL (1999) Water Level Management Plan Pasturefields SSSI
<b>Structure and function (including its typical species)</b>	<b>Water quality: salinity of spring water</b>	Ensure the salinity of spring water is at a level appropriate for supporting salt marsh vegetation	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.	PBA (2016) Salinity Monitoring and Assessment.
	<b>Water quality/ quantity</b>	Ensure water quality and quantity is maintained or restored as necessary to a standard which provides the necessary conditions to support the H1340 feature	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. Further site-specific investigations may be required to establish appropriate water quality standards for this particular SAC.  According to the Middlemarch report of 2002, the soil salinity target for Pasturefields saltmarsh is 8,000ug/g and the spring-water target is 3,700 ug/g.  Kadiri <i>et al.</i> (Sediment Characteristics of a restored saltmarsh in SE England in Hydrobiologia, 2011) show average chloride concentrations from sediments of restored saltmarsh (RSM) and natural saltmarsh (NSM) – with natural saltmarsh in late spring having a chloride concentration of 4,000ug/g, rising to 10,000ug/g in July.	MIDDLEMARCH ENVIRONMENTAL (2002) Pasture Fields Hydro-ecological Monitoring Report  ASPINWALL AND COMPANY (1995) NRA9STW) Hydrological Assessment of SSSI: Pasturefields Saltmarsh  PAM BROWN ASSOCIATES (2016) Salinity Monitoring and Assessment.
	<b>Hydrology: Water table and spring flow</b>	Restore water table levels and the spring flow regime during the year at levels	Defining and maintaining the appropriate hydrological regime is a key step in moving towards achieving the conservation objectives for this site and sustaining this feature..  Changes in source, depth, duration, frequency, magnitude and timing of water supply	MIDDLEMARCH ENVIRONMENTAL (2002) Pasture Fields Hydro-



Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		consistent with maintaining the H1340 feature	<p>can have significant implications for the assemblage of characteristic plants and animals present. This target is generic and further site-specific investigations may be required to fully inform conservation measures and/or the likelihood of impacts.</p> <p>Pam Brown Associates (2016) suggests the saltmarsh exists as a result of historic wildcat salt prospecting – drilling through an aquitard to bring saltwater to the surface by releasing artesian flow. Therefore, and unusually, restoration of a more natural hydrological regime (if it were possible) might well destroy the feature.</p>	ecological Monitoring Report
<b>Structure and function (including its typical species)</b>	<b>Maintaining integrity of hydrological catchment</b>	Restore the full range of hydrological/ hydrogeological aspects of a site's catchment that contribute to its functioning and the maintenance of the H1340 feature	<p>The movement, quality and distribution of water within a site's wider catchment and outside of the site's boundary will affect its ability to support this wetland habitat feature. Catchment size will vary.</p> <p>A site's water table and other hydrological aspects may be affected by changes in the use of the land surface, water abstraction, flood alleviation, development and mineral extraction in the wider catchment.</p> <p>The site receives surface water from the River Trent on its SW side and from run-off from the land on its NE side.</p>	MIDDLEMARCH ENVIRONMENTAL (2002) Pasture Fields Hydro-ecological Monitoring Report
	<b>Functional connectivity with wider landscape</b>	Maintain or restore the overall extent, quality and function of any supporting features within the local landscape which provide a critical functional connection with the site	<p>This recognises the potential need at this site to maintain or restore the connectivity of the site to its wider landscape in order to meet the conservation objectives. These connections may take the form of landscape features outside of the designated site boundary which are either important for the continuous supply of sediment to the site (such as soft eroding cliffs, dunes, offshore sand banks) or the migration, dispersal and genetic exchange of those typical species closely associated with qualifying Annex I habitat features of the site.</p> <p>These features may also be important to the operation of the supporting ecological processes on which the designated site and its features may rely. In most cases increasing actual and functional landscape-scale connectivity would be beneficial. Where there is a lack of detailed knowledge of the connectivity requirements of the qualifying feature, Natural England will advise as to whether these are applicable on a case by case basis.</p> <p>According to the inventory produced by Chatters (2017), there are six other inland saltmarshes within five miles of Pasturefields (Astonfields at SJ926248; Ingestre at SJ980247; Kingston Pool at SJ944235; Lion Lodge at SJ989239; Shirleywich at SJ984 259; and Tixall at SJ976 227. They are all small sites. They all lie on Mercia Mudstone, so their eco-hydrological characteristics are likely to be similar to those supporting</p>	CHATTERS, C., 2017. <i>Saltmarsh</i> . British Wildlife Collection vol. 5. Bloomsbury Natural History, London.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			Pasturefields. Whether the conservation of the inland saltmarsh at Pasturefields depends on maintenance or restoration of these sites is not known, but it is plausible that species typically associated with Pasturefields might survive better in a landscape of numerous scattered saltmarshes than a landscape with one isolated example. Beyond Staffordshire in the surrounding counties, Chatters lists twelve more sites in Cheshire, three in Warwickshire and four in Worcestershire.	
<b>Structure and function (including its typical species)</b>	<b>Adaptation and resilience</b>	Maintain the H1340 feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site	<p>This recognises the increasing likelihood of natural habitat features to absorb or adapt to wider environmental changes. Resilience 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 changes in sea levels, precipitation and temperature for example, which are likely to affect the extent, distribution, composition and functioning of a feature within a site. The vulnerability and response of features to such changes will vary.</p> <p>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 being <i>high</i>, taking into account the sensitivity, fragmentation, topography and management of its habitats/supporting habitats (Natural England, 2015). These sites are considered to be the most vulnerable sites overall and are likely to require the most adaptation action, most urgently. 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.</p>	NATURAL ENGLAND, 2015. Climate Change Theme Plan and National Biodiversity Climate Change Vulnerability Assessments (NBCCVAs). Available at <a href="http://publications.naturalengland.org.uk/publication/4954594591375360">http://publications.naturalengland.org.uk/publication/4954594591375360</a>
<b>Supporting processes (on which the feature relies)</b>	<b>Air quality</b>	Maintain the concentrations and deposition of air pollutants within the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System ( <a href="http://www.apis.ac.uk">www.apis.ac.uk</a> ).	<p>This habitat type 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 and causing the loss of sensitive typical species associated with it.</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.</p> <p>There are no set Critical Loads and Levels for this habitat type on APIS. Adopting the thresholds given for coastal saltmarsh habitats, this SAC is not currently exceeding values for ammonia, nitrogen and nitrogen oxides.</p>	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 ( <a href="http://www.apis.ac.uk">www.apis.ac.uk</a> ).

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>There are critical levels for ammonia (NH<sub>3</sub>), oxides of nitrogen (NO<sub>x</sub>) and sulphur dioxide (SO<sub>2</sub>), 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>	
<b>Supporting processes (on which the feature relies)</b>	<b>Conservation measures</b>	Maintain the management measures (either within and/or outside the site boundary as appropriate) which are necessary to maintain and restore the structure, functions and supporting processes associated with the H1340 feature	<p>Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site. 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>For this feature, conservation measures include grazing, cutting, scrub management, weed control, recreation/visitor management. Also covered is maintenance of surface drainage features such as drains, grips, gutters and foot drains. Retention of suitable land use infrastructure/patterns to enable site management e.g. pastoral livestock farming</p>	<p>ENGLISH NATURE, 2005. Views about the Management of Pasturefields Saltmarsh SSSI. Available at <a href="https://necmsi.esd.m.co.uk/PDFsForWeb/VAM/1003939.pdf">https://necmsi.esd.m.co.uk/PDFsForWeb/VAM/1003939.pdf</a></p> <p>NATURAL ENGLAND, 2014. Site Improvement Plan: Pasturefields Salt Marsh (SIP167)</p>
<b>Version Control</b>				
Advice last updated: n/a				
<b>Variations from national feature-framework of integrity-guidance:</b> The salt marsh feature at this SAC exhibits no important transitions between different vegetation or habitat types, so this attribute of habitat structure is not considered applicable.				

