



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

**Little Wittenham Special Area of Conservation (SAC)  
Site Code: UK0030184**



*Photo © Earth Trust*

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## **About this document**

This document provides Natural England's supplementary advice about the European Site Conservation Objectives relating to Little Wittenham 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>	Little Wittenham Special Area of Conservation (SAC)
<b>Location</b>	Oxfordshire
<b>Site Map</b>	The designated boundary of this site can be viewed <a href="#">here</a> on the MAGIC website
<b>Designation Date</b>	1 April 2005
<b>Qualifying Features</b>	See section below
<b>Designation Area</b>	69.76 hectares
<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>	Little Wittenham SSSI
<b>Relationship with other European or International Site designations</b>	N/A

### Site background and geography

Little Wittenham SAC is situated in the North Wessex Downs Area of Outstanding Natural Beauty in Oxfordshire. The site is located beside the River Thames and consists of an area of woodland with ponds, as well as grassland and scrub on the slopes of a prominent hill. The underlying geology is made up by Lower Chalk, Greensand and Gault Clay. The overlying clay soils are for the most part moderately calcareous. This is one of the best-studied great crested newt sites in the UK, and supports one of the largest known populations of this species in southern England. These are mostly associated with two larger ponds in the woodland but they range widely throughout the surrounding woodland and grassland.

The site is set in a largely rural, farmed landscape with the River Thames situated just to the north. The local landscape character is typical of this part of Oxfordshire, made up by a patchwork of permanent pasture and arable fields surrounded by neat hedges and narrow lanes and is part of the Upper Thames Clay Vales National Character Area ([NCA Profile 108](#)). The expanding settlement of Didcot is situated 3km to the south west. Little Wittenham is part of a larger privately-owned nature reserve and is a popular destination for quiet recreation. The site has a long-established programme of research and educational activities.

## **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 Species:**

- **S1166 Great crested newt *Triturus cristatus***

The great crested newt is the largest native British newt, reaching up to around 17cms in length. Newts require aquatic habitats for breeding. Eggs are laid singly on pond vegetation in spring, and larvae develop over summer to emerge in August – October, normally taking 2–4 years to reach maturity. Juveniles spend most time on land, and all terrestrial phases may range a considerable distance from breeding sites.

Little Wittenham is one of the best studied sites supporting great crested newt in the UK. The population is centred on two artificial ponds set in an area of long-established woodland with grassy rides and with adjoining areas of grazed pasture. The number of adult newts counted in detailed surveys has consistently numbered in excess of 2000 individuals making this one of the largest known populations in southern England. The site also supports other native amphibians with large numbers of common frog and smooth newt.

The great crested newt is also fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of the Conservation of Habitats and Species Regulations 2010 (as amended), making it a 'European Protected Species'. A Licence may therefore be required for any activities likely to harm or disturb great crested newts.

**Table 1: Supplementary Advice for Qualifying Features: S1166 *Triturus cristatus* Great crested newt**

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
<b>Population (of the feature)</b>	<b>Population abundance</b>	Maintain the abundance of the population at a level which is above 1000-2000, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.	<p>The size of great crested newt populations often vary between years as the recruitment of new generations is affected by factors such as pond dessication and habitat suitability. The objective is to seek to ensure that the site continues to support a viable population of a size which would be reasonably expected to occur at this site assuming that good habitat suitability is maintained.</p> <p>It is not currently possible to define a specific population size target at this site due to a lack of data but this aspect may be reviewed if better information becomes available.</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.</p> <p>Population size or presence should be measured using standard methods, such as peak mean counts or breeding surveys. Estimating the average size of the population will normally be based on the peak count of adults undertaken in the known peak season for the area, and in-year weather conditions. The peak count is derived by summing the counts across the site on 'best' night for each season.</p>	Franklin J 1997 On-going Monitoring of the Great Crested Newt <i>Triturus cristatus</i> at Little Wittenham Nature Reserve, Abingdon. Northmoor Trust – De Montford University.
<b>Population (of the feature)</b>	<b>Supporting meta-populations</b>	Maintain or restore as necessary the connectivity of the SAC population to any associated meta-populations (either within or outside of the site boundary)	Great crested newts often exist in 'meta-populations'. A meta-population is a group of associated populations made up of newts which breed in, and live around, a cluster of ponds. There will be some interchange of newts between these populations, even though most adults consistently return to the same pond to breed, and so it will be important to avoid the isolation of these populations from each other. A meta-population associated with a SAC may occur outside of the designated site boundary. The connectivity of the wider local landscape to the SAC may therefore be important in helping to ensure the survival of the overall population even if sub-populations are temporarily affected by, for example, pond desiccation or fish introductions.	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
<b>Supporting habitat: extent and distribution</b>	<b>Distribution of supporting habitat</b>	Maintain the distribution and continuity of the feature 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 supporting habitats) across the site will reduce its overall population size, and may undermine its resilience to adapt to future environmental changes. Contraction and fragmentation of supporting habitat may also adversely affect the ability of the feature to occupy and use habitat within the site. Such fragmentation may reduce the suitability of the habitat to support the species, such through increasing drying out of the land, reduced humidity and reduced protection from predators.</p> <p>The extent and distribution of supporting habitat for great crested newt at Little Wittenham and its connectivity with the surrounding landscape is reasonably well understood as a result of detailed research and surveys. Newts have been found to travel over 200 metres from the core breeding ponds but appear to be strongly associated with the surrounding woodland. The areas of woodland with a predominantly broadleaf canopy rather than conifer are favoured and areas with high frequency of fallen timber tend to support larger numbers. The objective is to seek to ensure that suitable terrestrial habitat conditions are maintained in the vicinity of known breeding ponds and that good connectivity is maintained to supporting habitat in the wider landscape. For example, ponds in domestic gardens in Little Wittenham village have been reported to support great crested newt and these may be an important part of the supporting habitat mosaic. So connectivity between the village and SAC should be maintained.</p> <p>The retention of features in the landscape such as shady, humid woodland, damp grassland, log piles, bramble patches, damp hollows and ephemeral pools will be particularly valuable. It is likely that these play an important role in supporting the local meta-population. These should be retained and care taken to avoid the creation of new barriers to newt movement between them and the wider landscape.</p>	
<b>Supporting habitat: extent and distribution</b>	<b>Extent of supporting habitat</b>	Maintain the total extent of the habitats which support the feature.	It is acknowledged that it is difficult to define an appropriate extent of supporting habitat for great crested newt meta-populations. Newt population densities have been found to vary widely in response to a range of factors including the condition and suitability of breeding ponds, habitat diversity, land use, habitat management, availability of hibernacula, recreational disturbance, level of predation, etc.	This attribute will be periodically monitored as part of Natural England's <a href="#">SSSI Condition Assessments</a>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>However, a guiding principle should be to seek to ensure that there is no reduction in the overall extent of breeding pond and terrestrial habitat in the core area supporting the local meta-population. It will be important that this is taken into account when planning management of both the core area thought to be utilised by the meta-population and areas immediately adjacent which may be of critical value for the survival of the meta-population.</p> <p>The information available on the baseline extent and distribution of supporting habitat used by the feature may be better defined in future in the light of new information.</p>	
<b>Supporting habitat: structure/function</b>	<b>Cover of macrophytes</b>	Maintain a high cover of macrophytes, typically between 50-80%, within ponds	<p>Great crested newts lay their eggs on submerged water plants, showing a preference for plants with curled leaves which offer a degree of protection from predation, such as pondweed <i>Elodea</i> spp., flote grass <i>Glyceria fluitans</i>, brooklime <i>Veronica beccabunga</i> and water forget-me-not <i>Myosotis scorpioides</i>.</p> <p>The presence of other submerged and floating plants can be important in providing cover and protection from predation. Ideally, ponds should have a balance between submerged, emergent, floating and marginal plants, as ponds with a diversity of aquatic vegetation types and structures will generally support a higher biodiversity.</p> <p>However, great crested newts are adapted to utilise ponds which may in some years dry out completely and this will affect the composition of the aquatic plant community. So important 'breeding ponds' often appear to be sub-optimal. Where the marginal vegetation is particularly invasive, and provides no specific benefit to crested newts, it may be appropriate to remove or reduce it. In ponds where conditions are unsuitable for the growth of submerged water plants but habitat conditions are otherwise good for great crested newts they may utilise submerged fallen leaves for egg-laying.</p>	This attribute will be periodically monitored as part of Natural England's <a href="#">SSSI Condition Assessments</a>
<b>Supporting habitat: structure/function</b>	<b>Overall Habitat Suitability Index score</b>	Maintain an overall Great Crested Newt Habitat Suitability Index score of no less than 0.8.	The Habitat Suitability Index provides a measure of evaluating habitat quality and quantity for great crested newt. The Index score lies between 0 and 1, with 1 representing optimal great crested newt habitat. In general, the higher the index score the more likely the site is to support great crested newts. The Habitat Suitability Index	<a href="#">Great Crested Newt Habitat Suitability Index ARG-UK Advice Note 5 (May 2010)</a>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>methodology is documented in ARG-UK Advice Note 5.</p> <p>The methodology should not be used as a substitute for more detailed surveys and consideration of other attributes where necessary.</p>	
<b>Supporting habitat: structure/function</b>	<b>Permanence of ponds</b>	Maintain the permanence of water within ponds in the site	Newts will utilise ponds of different size, water depth and permanence at different times and different life stages. To be of greatest value as breeding ponds there should be a high degree of permanence, i.e. should only dry out in exceptionally dry years. Occasional drying out of breeding ponds can play an important role in reducing the suitability of ponds for species which compete with or prey on great crested newts, such as fish, and other amphibians.	This attribute will be periodically monitored as part of Natural England's <a href="#">SSSI Condition Assessments</a>
<b>Supporting habitat: structure/function</b>	<b>Presence of fish</b>	Ensure fish are absent in all breeding ponds.	Fish can be significant predators of newt larvae and many species reduce the suitability of ponds for newts and other amphibians by increasing turbidity through disturbance of bottom sediments.	This attribute will be periodically monitored as part of Natural England's <a href="#">SSSI Condition Assessments</a>
<b>Supporting habitat: structure/function</b>	<b>Presence of ponds</b>	Maintain or restore where necessary the number of ponds present within the site.	This refers to all ponds in the core area of the site thought to be critical in supporting the full range of life stages of the local great crested newt population, so will include breeding ponds as well as non-breeding ponds and ephemeral ponds.	
<b>Supporting habitat: structure/function</b>	<b>Shading of ponds</b>	Ensure pond perimeters are generally free of shade (typically no more than 60% cover of the shoreline)	Although great crested newts have a strong association with woodlands as well as more open habitats shading from trees and shrubs can negatively affect the suitability of ponds to support the species. Heavy shading will tend to reduce the cover of submerged and marginal vegetation, water temperature and the rate of hatching and development of great crested newt eggs and larvae. Ideally, ponds should receive light for a significant proportion of the day through most of the year, especially during the tadpole stage.	
<b>Supporting habitat: structure/function</b>	<b>Soils, substrate and nutrient cycling</b>	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	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. Changes to natural soil properties may therefore affect the ecological structure, function and processes associated with the supporting habitat of this Annex II feature.	



Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
<b>Supporting habitat: structure/function</b>	<b>Supporting terrestrial habitat</b>	Maintain or restore where necessary the quality of terrestrial habitat likely to be utilised by Great Crested Newts, with no fragmentation of habitat by significant barriers to newt dispersal.	<p>Great crested newts need both aquatic and terrestrial habitat. Good quality terrestrial habitat, particularly within 500m of the breeding ponds, provides important sheltering, dispersing and foraging conditions. A wide range of semi-natural habitats are utilised by newts including meadows, tussocky grassland, scrub, woodland, as well as 'brownfield' land or low-intensity farmland. Good quality terrestrial habitat for great crested newt has structural diversity which can be provided by features such as hedges, ditches, stone walls, old farm buildings, loose stone/rocks, rabbit burrows and small mammal holes. Good quality habitat is that which will provide a variety of food sources for newts, such as earthworms, insects, spiders and slugs, as well as cover and protection from predation.</p> <p>Habitat fragmentation refers to significant barriers to newt movement such as walls and buildings, but not footpaths or tracks which newts can usually cross. Newts disperse over land to forage for food, and move between ponds, sometimes over a considerable distance. The distances moved during dispersal vary widely according to habitat quality and availability. At most sites, the majority of adults probably stay within around 250 to 300m of the breeding ponds but may well travel further if there are areas of high quality foraging and refuge habitat extending beyond this range.</p>	Franklin P 1993 The Migratory Ecology and Terrestrial Habitat Preferences of the Great Crested Newt <i>Triturus cristatus</i> at Little Wittenham Nature Reserve. M.Phil Thesis, De Montford University Department of Applied Biology and Biotechnology.
<b>Supporting processes (on which the feature and/or its supporting habitat relies)</b>	<b>Adaptation and resilience</b>	Maintain the feature's ability, and that of its supporting habitat, to adapt or evolve to wider environmental change, either within or external to the site	<p>This recognises the increasing likelihood of supporting 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. 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 SAC to climate change has been assessed by Natural England (2015) as being high taking into</p>	Natural England, 2015. <a href="#">Climate Change Theme Plan and supporting NBCCV Assessments for SACs and SPAs</a>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>account the sensitivity, fragmentation, topography and management of its supporting 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.</p> <p>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.</p> <p>In the case of the great crested newt the potential impacts of climate change are not well understood but as breeding behaviour, egg-laying and tadpole development are all heavily influenced by temperature there may be effects on reproduction and breeding success. It is also likely that increasing extremes of weather will affect habitat suitability for newts. In particular, frequent drying out of ponds in spring before tadpoles have completed their metamorphosis to the adult stage has the potential to have serious consequences for newt populations. Resilience will be improved through the provision of good quality supporting habitat which provides a diversity of structure and habitat type, and the availability of ponds with a range of water depth within the dispersal area of the newt population, including ponds which are off-site.</p>	
<b>Supporting processes (on which the feature and/or its supporting habitat relies)</b>	<b>Air quality</b>	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 ( <a href="http://www.apis.ac.uk">www.apis.ac.uk</a> ).	<p>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.</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 (NH<sub>3</sub>), oxides of nitrogen (NO<sub>x</sub>) and sulphur dioxide (SO<sub>2</sub>), and critical loads for</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>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.</p> <p>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. 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 and/or its supporting habitat 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 the structure, functions and supporting processes associated with the feature and/or its supporting habitats.	<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>In the case of great crested newt the priorities for management are the maintenance of breeding ponds in suitable condition, free of predatory species, and with good water quality, and the maintenance of appropriate terrestrial habitat conditions. Great crested newt tadpoles are particularly vulnerable to predation by fish, herons, kingfishers, grass snakes and other newts. Habitat changes which may increase vulnerability to predation can be highly damaging to newt populations.</p>	<p><a href="#">Views About Management document for Little Wittenham SSSI</a></p> <p><a href="#">Baker J Beebee T Buckley J Gent T &amp; Orchard D 2011 Amphibian Habitat Management Handbook. Amphibian and Reptile Conservation, Bournemouth.</a></p>
<b>Supporting processes (on which the feature and/or its supporting habitat relies)</b>	<b>Water quantity/ quality</b>	Where the feature or its supporting habitat is dependent on surface water and/or groundwater maintain water quality and quantity to a standard which provides the necessary conditions to support the feature.	Great crested newt populations are critically dependent on the quality and quantity of water supply to their supporting wetland habitats. Poor water quality and inadequate quantities of water can adversely affect the structure and function of ponds and their suitability for great crested newt. Described in simple terms ponds will be more suitable for great crested newt where they have high water clarity, low or very low nutrient status, and high levels of dissolved oxygen. The water regime should be as near natural condition as possible, ie supplied by rainfall and surface flow/groundwater seepage.	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
<b>Supporting processes (on which the feature or its supporting habitat relies)</b>	<b>Water quality</b>	Maintain high water quality in all ponds in the core area supporting the meta-population.	<p>Great crested newts will often utilise a network of ponds, ditches and wet hollows, in addition to core 'breeding ponds'. It may be of critical importance that this network is maintained in good condition to support the local newt population. Water quality will be affected by factors such as nutrient input, turbidity and surrounding land use.</p> <p>As the clarity and chemical status of water bodies supporting great crested newt can be subjective, the presence of an abundant and diverse community of freshwater invertebrates can be useful as a proxy indication of suitable water quality. Invertebrate groups present which will indicate high suitability for newts will include mayfly larvae and water shrimps. This will ensure ponds support a healthy ecosystem which provides food for developing newt larvae and adults.</p>	
<b>Version Control</b>				
Advice last updated: N/A				
<b>Variations from national feature-framework of integrity-guidance:</b> N/A				