



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

**Baston Fen Special Area of Conservation (SAC)  
Site code: UK0030085**



Photo: John Oliver, Lincolnshire Wildlife Trust

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## **About this document**

This document provides Natural England's supplementary advice about the European Site Conservation Objectives relating to Baston Fen 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>	Baston Fen Special Area of Conservation (SAC)
<b>Location</b>	Lincolnshire
<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>	2.20 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>	Baston & Thurlby Fens SSSI
<b>Relationship with other European or International Site designations</b>	N/A

### Site background and geography

Baston Fen SAC lies within the Fens Natural Character Area ([NE424](#)), a large, low-lying, flat agricultural landscape with many drainage ditches, dykes and rivers that slowly drain towards the Wash, England's largest tidal estuary.

The SAC comprises the Counter Drain, which is a large, slow-flowing drainage channel lying adjacent to Baston Fen. It is approximately 2.3km in length. The drain forms an important refuge for a diverse community of aquatic and emergent plants including yellow water-lily *Nuphar lutea*, needle spike-rush *Eleocharis acicularis*, arrowhead *Sagittaria sagittaria*, frogbit *Hydrocharis morsus-ranae*, fan-leaved water-crowfoot *Ranunculus circinatus* and spiked watermilfoil *Myriophyllum spicatum*.

Of particular note is the presence of an unusually rich assemblage of pondweeds which includes perfoliate pondweed *Potamogeton perfoliatus*, flat-stalked pondweed *P. friesii*, the nationally uncommon hairlike pondweed *P. trichoides* and grass-wrack pondweed *P. compressus*.

The site is also rich in freshwater invertebrates, including dragonflies, damselflies, aquatic snails and water beetles. Amongst the variety of fish which have been recorded from the site is the spined loach *Cobitis taenia*, a significant population of which occurs in the Counter Drain.



## 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:

- **S1149. *Cobitis taenia*; Spined loach**

The spined loach *Cobitis taenia* is one of the UK's smallest freshwater fish, usually reaching no more than 14 centimetres in length. Its name is derived from the two small spines present under each eye. It is a bottom-living fish that has a restricted microhabitat associated with a specialised feeding mechanism.

They use a complex branchial or gill apparatus to filter-feed in fine but well-oxygenated sediments. Optimal habitat is typically standing or slow-moving open water with a patchy cover of submerged (and possibly emergent) plants which are important for spawning during summer, and a sandy or silty substrate into which juvenile fish tend to bury themselves when inactive.

Whilst spined loach has a broad European range, in the UK it appears to be restricted to just five east-flowing river systems in eastern England – the Rivers Trent, Welland, Witham, Nene and Great Ouse, with their associated waterways. The fish has limited means of dispersal so UK populations are largely genetically isolated from each other. Baston Fen SAC represents spined loach populations within the River Welland catchment.

Spined loach are found both in the River Glen and Counter Drain and water is annually let from the River Glen to flood Baston Fen where the water is eventually released into Counter Drain. It has not been yet been proved that there is no transfer of spined loach between the Glen and Counter Drain in the process. Only the Counter Drain is internationally designated for its spined loach population.



The JNCC SAC description<sup>1</sup> notes that *‘the Counterdrain, a large drainage channel running alongside Baston Fen, contains high densities of Spined Loach (Cobitis taenia). It is an example of Spined Loach populations in the Welland catchment. The patchy cover from submerged plants provides excellent habitat for the species’*.

Population densities of spined loach are substantially lower than in 1998. It appears from the 2015 and 2018 surveys that there has been a significant decline in population.

Summary of past population abundance:

Year	Mean Density No./m <sup>2</sup>	No. of age classes	% of population in 0+ age group
1998	0.69	>2	52
2001	0.14	>2	75
2012	0.16	>2	62
2015	0.04	>2	27
2018	0.02	>2	0

Since 1999 there has been a documented decline in the population of spined loach. In 1999 densities were noted as being 0.72 fish m<sup>-2</sup>. By 2001 this had fallen to 0.14 fish m<sup>-2</sup>, and 0.16 fish m<sup>-2</sup> in 2012. By 2015 the densities of fish had further fallen to a mean density of 0.04 fish m<sup>-2</sup> (Nunn & Cowx, 2016). The report noted that the spined loach population in the River Glen Counter Drain SAC did not satisfy the criteria to achieve favourable condition (>0.10m<sup>-2</sup>, >2 age classes, >50% 0+ individuals) in October 2015. In particular, the density of spined loach (0.04 m<sup>-2</sup>), which was both below the criterion to achieve favourable condition and significantly lower than in 2012. In addition, although sufficient age classes were present to achieve favourable condition, they were not present in “significant densities”, and 0+ individuals represented only 27% of the catch.

Nunn & Cowx (2016) goes on to say *“The highest densities and numbers of age classes of Spined Loach were recorded from the upstream half of the Counter Drain. Field observations in 2012 indicated that the habitat in the upstream reach of the Counter Drain was characterised by oxic, rather than anoxic, mud, extensive submerged macrophytes and relatively fast-flowing water, as well as relatively large and small, respectively, coverages of gravel and filamentous algae. Only minor differences in habitat coverage in 2012 and 2015 were observed, but field observations suggested that the depth of fine sediments in the study area has increased since 2012. It is therefore recommended that sympathetic dredging, in alternate sections, is undertaken to reduce the quantity of fine sediments.*

According to the CSM guidance (JNCC, 2005), substrata should ideally be at least 20% sand and no more than 40% silt. It notes that whilst Spined loach can tolerate mud and silt, a combination of sandy substrata and submerged macrophytes is believed to be optimal for foraging, refuge and spawning: excessive organic loading could result in low dissolved oxygen near the sediment-water interface and increased egg and juvenile mortality (JNCC, 2005).

Between 2004-2007 surveys of the neighbouring Gravel Drain were undertaken to monitor ‘Before and After’ dredging populations of spined loach by the Environment Agency (2007). The report concluded no significant difference in age class or number of individual between pre- and post-dredging.

Since 1999 there have been several NE consented weed cutting operations along the Counter Drain, and much discussion about desilting. In October 2018 the Counter Drain and surrounding ditches (including the Gravel Drain) were surveyed by the Lincolnshire Wildlife Trust to inform ditch management works. Preliminary analysis of the survey data shows that the mean density of spined loach in the

<sup>1</sup> <http://jncc.defra.gov.uk/ProtectedSites/SACselection/species.asp?FeatureIntCode=S1149>

Counter Drain has fallen to a mean density of 0.02 fish m<sup>-2</sup>, with less than two age classes (LWT 2018 unpublished). Silt depth was also recorded and for much of the drains length, with sediment being up to 600mm in places with an average of 300mm.

The 2018 survey of the neighbouring sections of the Counter Drain (outside of the SAC) and the Gravel Drain show that they currently support a higher populations of spined loach compared to the designated section of the Counter Drain. These drains are typically managed more frequently (with de-silting and weed cutting) and consequently have more open conditions, with less emergent vegetation and shallower depths of silt (c. 100mm).

It is hoped with the planned 2018-2022 ditch management spined loach from the wider population will help increase numbers in the Counter Drain SAC. However the low proportion of individual fish in the youngest age group (i.e. 0+, or fry, or young-of the year) is currently a cause for concern for the sustainability of the wider population.

## References

Available from Natural England on request;

APEM (2002). Investigation of Ecological Requirements of Spined Loach. Section 5. Site Specific Population Surveys: the Status of Spined Loach in Wicken Lode, Moreton's Leam and Glen Counter Drain. Report to Environment Agency & English Nature.

ENVIRONMENT AGENCY (2005) [Screening for Intake and Outfalls: a best practice guide](#) Environment Agency Science report SC030231 2005

LINCOLNSHIRE WILDLIFE TRUST (2018). Survey data of Spined Loach *Cobitis taenia* within the Counter Drain SAC (part of Baston and Thurlby Fens SSSI) in October 2018. Lincolnshire Wildlife Trust, Unpublished.

NATURAL ENGLAND, 2014. Site Improvement Plan: Baston Fen ([SIP010](#))

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>

NUNN, A.D & COWX, I.G. (2013). Survey of spined loach *Cobitis taenia* within the Counter Drain SAC (part of Baston and Thurlby Fens SSSI) and the Gravel Drain, University of Hull

NUNN, A.D. & COWX, I.G. (2016). Survey of Spined Loach *Cobitis taenia* within the Counter Drain SAC (part of Baston and Thurlby Fens SSSI) in October 2015. University of Hull International Fisheries Institute.

PERROW, M. R., HINDES, A. M., TOMLINSON, M. L. & LEIGH, S. (1999). Identification of prospective Special Areas of Conservation (SACs) for Spined Loach *Cobitis taenia*. *English Nature Research Report*, No. 314.

**Table 1: Supplementary Advice for Qualifying Features: S1149. *Cobitis taenia*; Spined loach**

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
<b>Population (of the feature)</b>	<b>Juvenile densities</b>	Maintain densities of juvenile Spined Loach at levels expected under un-impacted conditions throughout the site, taking into account natural habitat conditions and allowing for natural fluctuations	Impacts on physical, chemical or hydrological integrity, or from non-native species, may suppress juvenile densities.	This attribute will be periodically monitored as part of Natural England's site condition assessments.
<b>Population (of the feature)</b>	<b>Population abundance</b>	<p>Restore the abundance of the Spined Loach population to the levels below, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent;</p> <p>Adult population density &gt;0.1/ m<sup>2</sup></p> <p>At least 2 different year-classes should be present at significant densities.</p> <p>At least 50% of the population should consist of the 0+ age group, and the largest females attain a fork length &gt;85mm</p>	<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.</p> <p>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>APEM (2002). Investigation of Ecological Requirements of Spined Loach. Section 5. Site Specific Population Surveys: the Status of Spined Loach in Wicken Lode, Moreton's Leam and Glen Counter Drain. Report to Environment Agency &amp; English Nature.</p> <p>Perrow, M. R., Hindes, A. M., Tomlinson, M. L. &amp; Leigh, S. (1999). Identification of Prospective Special Areas of Conservation (SACs) for Spined Loach <i>Cobitis taenia</i>. English Nature Research Report Series, No. 314.</p> <p>Nunn &amp; Cowx (2013) Survey of spined loach <i>Cobitis taenia</i> within the Counter Drain SAC (part of Baston and</p>



Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			Unless otherwise stated, the population size or presence will be that measured using standard methods, such as peak mean counts or breeding surveys. 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.	Thurlby Fens SSSI) and the Gravel Drain, University of Hull  Nunn, A.D. & Cowx, I.G. (2016). Survey of Spined Loach <i>Cobitis taenia</i> within the Counter Drain SAC (part of Baston and Thurlby Fens SSSI) in October 2015. University of Hull International Fisheries Institute.  Lincolnshire Wildlife Trust (2018). Survey data of Spined Loach <i>Cobitis taenia</i> within the Counter Drain SAC (part of Baston and Thurlby Fens SSSI) in October 2018. Lincolnshire Wildlife Trust, Unpublished.
<b>Supporting habitat: extent and distribution</b>	<b>Distribution of supporting habitat</b>	Maintain the distribution and continuity of the Spined Loach population and its supporting habitat, including where applicable its component vegetation types and associated transitional vegetation types, across the site	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.  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. Such fragmentation may have a greater amount of open edge habitat which will differ in the amount of light, temperature, wind, and even noise that it receives compared to its interior. These conditions may not be suitable for this feature and this may affect its viability.	This attribute will be periodically monitored as part of Natural England's <a href="#">SSSI Condition Assessments</a>
<b>Supporting habitat: extent and</b>	<b>Extent of supporting habitat</b>	Maintain the total extent of the habitat which support the Spined Loach population at 2.20ha	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	This attribute will be periodically monitored as part of Natural England's

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
distribution			<p>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.</p> <p>At this SAC, spined loach habitat comprise standing water in lage drainage channels. These are artificial habitats created by land drainage, or occasionally by the channelisation of small streams. They may represent the only remaining freshwater habitat within former wetland areas, and often support a wide range of aquatic plant and animal (in particular invertebrate) species that would have previously been more widespread in ponds and wetlands.</p>	<a href="#">SSSI Condition Assessments</a>
Supporting habitat: structure/ function	Introduction of fish species	Ensure fish stocking/ introductions do not interfere with the ability of the river to support self-sustaining populations of the feature	<p>The presence of artificially high densities of fish can create unacceptably high levels of predatory pressure on spined loach. The management aim is to provide conditions in the river that support a healthy, natural and self-sustaining salmon population, achieved through habitat protection/restoration and the control of exploitation as necessary.</p> <p>Stocking represents a loss of naturalness and, if successful, obscures the underlying causes of poor performance (potentially allowing these risks to perpetuate). It carries various ecological risks, including the loss of natural spawning from broodstock, competition between stocked and naturally produced individuals, disease introduction and genetic alterations to the population</p>	
Supporting habitat: structure/ function	Integrity of off-site habitats	Maintain any supporting habitats beyond the SAC boundary upon which the SAC spined loach population may depend.	<p>Spined loach populations within the SAC may be dependent on the integrity of sections of river channel and riparian areas that lie outside of the site boundary.</p> <p>Headwater areas and tributaries may not fall within the site boundary, yet spined loach may use these areas for spawning and juvenile development and be critical for sustaining populations within the site.</p> <p>Spined loach are found both in the River Glen, Counter Drain and Gravel Drain.</p>	This attribute will be periodically monitored as part of Natural England's <a href="#">SSSI Condition Assessments</a>
Supporting	Screening of	Ensure any intakes and outfalls	Spined loach can be caught or entrained in intakes and discharges	ENVIRONMENT

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
habitat: structure/ function	intakes and discharges	likely to entrain a significant number of spined loach are adequately screened.	along with other fish species if appropriate protection is not provided, ideally using <a href="#">best practice guidelines</a> such as those produced by the Environment Agency.	AGENCY, 2005. <a href="#">Screening for Intake and Outfalls: a best practice guide</a> Science report SC030231 2005.
Supporting habitat: structure/ function	Invasive non-native species	Maintain the mean cover of aggressive non-native plants at least than 1%.  Maintain the mean total combined cover of all non-native species and introduced species at less than 30%.	Species such as signal crayfish may have a serious effect on spined loach habitat (by destabilising banks and enhancing very fine sediment input), and may predate heavily on spined loach if present at high densities.  Chinese mitten crab has the potential to migrate long distances up rivers and may cause similar damage to spined loach habitat.	
Supporting habitat: structure/ function	Cover of submerged macrophytes	Maintain sufficient submerged and marginal vegetation to maintain cover and spawning substrate unaffected by channel management practices.	Submerged and marginal vegetation provides vital cover for spined loach. Submerged plants are used for egg-laying. Rotational cutting regimes to maintain channel habitat should be adequate for spined loach	This attribute will be periodically monitored as part of Natural England's <a href="#">SSSI Condition Assessments</a>
Supporting habitat: structure/ function	Water quality	Maintain the nutrient regime of the Counter Drain at or below the following levels;  An annual mean of 0.1mg/l-1 total phosphorous.  Biological Water Quality in ditches target equivalent to Class 'b' in the biological module of the General Quality Assessment scheme (GQA)  Dissolved oxygen, ammonia, BOD equivalent quality to Chemical GQA Class 'C'  Mean cover of filamentous macro-algae and <i>Enteromorpha</i> not more than 10%	Nutrient enrichment can lead to loss of substrate condition for spined loach due to benthic algal growth and associated enhanced siltation. It also increases the risk of impacts on the submerged plant community, which the spined loach uses for cover.  In ditches, spined loach can be abundant in enriched conditions with high levels of filamentous algal cover - however, this is not considered to be optimal habitat conditions for the species, and is not consistent with the conservation of ditch habitat.  The spined loach is susceptible to both episodic and chronic organic pollution. Episodic pollution causes direct mortalities whilst chronic pollution affects substrate condition through the build-up of sediment oxygen demand and excessive microbial populations.  If the organic content of the substrate becomes too high, reduced oxygen availability near the sediment/water interface may lead to enhanced egg and juvenile mortality.  During the spined loach surveys completed by Hull University (2012,	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			2015) and Lincolnshire Wildlife Trust (2018) the mean cover of filamentous macro-algae and <i>Enteromorpha</i> was recorded.	
Supporting habitat: structure/function	Woody debris	Retain large woody debris generated naturally by native riparian trees; in smaller watercourses, temporary debris dams should be a feature of channel dynamics.	Woody debris is important in shaping natural mosaics in rivers, on which the spined loach and other species depend.  At this site, this will help to provide a more natural channel morphology to the artificial channels to benefit this feature	This attribute will be periodically monitored as part of Natural England's <a href="#">SSSI Condition Assessments</a>
Supporting habitat: structure/function	Biological connectivity	Maintain the free movement of spined loach within supporting habitats.	Even weirs with small vertical drops will prevent re-colonisation of upper reaches affected by lethal pollution episodes or drought, and more generally will also lead to constraints on genetic interactions that may have adverse consequences.  Free movement within the channels is necessary to ensure maintenance of genetic diversity (and therefore population viability). New artificial constraints to movement should be avoided and existing barriers should be removed wherever possible.  Unobstructed passage is also necessary to maintain genetic diversity and allow recolonisation following environmental perturbations. Notwithstanding, weirs may improve the habitat suitability for spined loach immediately downstream by increasing water velocities and displacing fine sediments.  The highest densities of spined loach in the 2012 and 2015 University of Hull surveys were recorded from below the weir in the Counter Drain. Conversely, habitat quality may deteriorate upstream of weirs due to the accretion of fine sediments.	
Supporting habitat: structure/function	Flow regime	Maintain a flow regime which is characteristic of supporting standing water habitat	The flow regime is critical to all aspects of the spined loach life cycle, maintaining the habitat that is optimal for the species.	
Supporting habitat: structure/function	Sediment regime	Restore in-channel substrate character of at least 20% sand and no more than 40% silt.	Excessive delivery of very fine sediment, from the catchment or artificially enhanced bank erosion, can produce sub-optimal feeding conditions for spined loach and can interfere with submerged plant communities on which the species relies for cover and spawning.  For optimal conditions substrates should be at least 20% sand and no more than 40% silt. Whilst the species can tolerate silt and mud, it has	NATURAL ENGLAND, 2014. Site Improvement Plan: Baston Fen SAC ( <a href="#">SIP010</a> )

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>a preference for sandy substrate. High sediment cohesiveness is likely to adversely affect the feeding process.</p> <p>Planned desilting works are programmed for the winter of 2018/19 through to the winter of 2022/23. These works will be carried out (under an assent) by the Welland and Deeping Internal Drainage Board and overseen by the South East Lincs Reserve Officer from Lincolnshire Wildlife Trust.</p>	
<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.</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 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 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. A site based assessment should be carried out as a priority.</p> <p>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>NATURAL ENGLAND, 2015. Climate Change Theme Plan and supporting National Biodiversity Climate Change Vulnerability assessments ('NBCCVAs') for SACs and SPAs in England Available at <a href="http://publications.naturalengland.org.uk/publication/4954594591375360">http://publications.naturalengland.org.uk/publication/4954594591375360</a></p>



Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
<b>Supporting processes (on which the feature and/or its supporting habitat relies)</b>	<b>Air quality</b>	Maintain or restore as necessary the concentrations and deposition of air pollutants below the site-relevant Critical Load or Level values given for the supporting habitat of this feature 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 generally 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 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>	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> ).
<b>Supporting processes (on which the feature and/or its supporting habitat relies)</b>	<b>Conservation measures</b>	Restore the management measures (either within and/or outside the site boundary as appropriate) which are necessary to restore the structure, functions and supporting processes associated with the spined loach population 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.</p> <p>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>NATURAL ENGLAND, 2014. Site Improvement Plan: Baston Fen SAC (<a href="#">SIP010</a>)</p> <p>ENGLISH NATURE, 2005. <a href="#">Views about the management of Baston and Thurlby Fens SSSI</a>.</p>
<b>Version Control</b> Advice last updated: n/a				
<b>Variations from national feature-framework of integrity-guidance:</b> Attributes relevant only to river habitats designated for spined loach have been removed.				

