Conservation objectives and definitions of favourable condition for designated features of interest



These Conservation Objectives relate to all designated features on the SSSI, whether designated as SSSI, SPA, SAC or Ramsar features.

South and West Yorks. Team
Bullring House
Northgate
Wakefield WF1 3BJ
0300 060 1851
0300 060 2271
Tim.kohler@naturalengland.org.uk

Name of Site of Special Scientific Interest (SSSI)					
Thorne, Crowle and Goole Moors					
Names of designated international site	es e				
Special Area for Conservation (SAC)	Thorne Moor				
Special Protection Area (SPA)	Thorne and Hatfield Moors				
Ramsar					
Polationship between site designation	Deletionship between site designations				

Relationship between site designations

Thorne Moor qualifies as a SAC under the EC habitats Directive for the following Annex 1 habitats:

- Degraded raised bogs still capable of natural regeneration

Thorne Moors form part of the Thorne and Hatfield Moors SPA, qualifying for the following Annex 1 Species:

- Nightjar (Caprimulgus europaeus)

SAC covers whole of the SSSI excluding a small area of grassland on the west boundary. The SPA (of which this site is only part) covers a similar area excluding a slightly larger part of the grassland/fen (See map 1)

Version control information				
Status of this Version	Consultation Draft			
(Draft, Consultation Draft, Final)				
Prepared by	Tim Kohler			
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favourable condition used	Freshwater 2005			
	Birds 2004			
	Invertebrates 2008			

Other notes/\	version history	
Quality assur	ance information	
Checked by	Name	Date
	Tom Keatley	
	Signature	

Conservation Objectives and definitions of Favourable Condition: notes for users

Conservation Objectives

SSSIs are notified because of specific biological or geological features. Conservation Objectives define the desired state for each site in terms of the features for which they have been designated. When these features are being managed in a way which maintains their nature conservation value, then they are said to be in 'favourable condition'. It is a Government target that 95% of the total area of SSSIs should be in favourable condition by 2010.

Definitions of Favourable Condition

The Conservation Objectives are accompanied by one or more habitat extent and quality definitions for the special interest features at this site. These are subject to periodic reassessment and may be updated to reflect new information or knowledge; they will be used by Natural England and other relevant authorities to determine if a site is in favourable condition. The standards for favourable condition have been developed and are applied throughout the UK.

Use under the Habitats Regulations

The Conservation Objectives and definitions of favourable condition for features on the SSSI may inform the scope and nature of any 'appropriate assessment' under the Habitats Regulations. An appropriate assessment will also require consideration of issues specific to the individual plan or project. The habitat quality definitions do not by themselves provide a comprehensive basis on which to assess plans and projects as required under Regulations 20-21, 24, 48-50 and 54 - 85. The scope and content of an appropriate assessment will depend upon the location, size and significance of the proposed project. Natural England will advise on a case by case basis.

Following an appropriate assessment, competent authorities are required to ascertain the effect on the integrity of the site. The integrity of the site is defined in paragraph 20 of ODPM Circular 06/2005 (DEFRA Circular 01/2005) as the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified. The determination of favourable condition is separate from the judgement of effect upon integrity. For example, there may be a time-lag between a plan or project being initiated and a consequent adverse effect upon integrity becoming manifest in the condition assessment. In such cases, a plan or project may have an adverse effect upon integrity even though the site remains in favourable condition.

The formal Conservation Objectives for European Sites under the Habitats Regulations are in accordance with paragraph 17 of ODPM Circular 06/2005 (DEFRA Circular 01/2005), the reasons for which the European Site was classified or designated. The entry on the Register of European Sites gives the reasons for which a European Site was classified or designated.

Explanatory text for Tables 2 and 3

Tables 2, 2a and 3 set out the measures of condition which we will use to provide evidence to support our assessment of whether features are in favourable condition. They are derived from a set of generic guidance on favourable condition prepared by Natural England specialists, and have been tailored by local staff to reflect the particular characteristics and site-specific circumstances of individual sites. Quality Assurance has ensured that such site-specific tailoring remains within a nationally consistent set of standards. The tables include an audit trail to provide a summary of the reasoning behind any site-specific targets etc. In some cases the requirements of features or designations may conflict; the detailed basis for any reconciliation of conflicts on this site may be recorded elsewhere.

Conservation Objectives

The Conservation Objectives for this site are, subject to natural change, to maintain the following habitats and geological features in favourable condition (*), with particular reference to any dependent component special interest features (habitats, vegetation types, species, species assemblages etc.) for which the land is designated (SSSI, SAC, SPA, Ramsar) as individually listed in Table 1.

Habitat Types represented (Biodiversity Action Plan categories)
Bogs

Geological features (Geological SiteTypes) Not applicable

(*) or restored to favourable condition if features are judged to be unfavourable.

Standards for favourable condition are defined with particular reference to the specific designated features listed in Table 1, and are based on a selected set of attributes for features which most economically define favourable condition as set out in Table 2, Table 2a and Table 3:

Table 1 Individual designated interest features

BAP Broad Habitat type / Geological Site Type	Specific designated features	Explanatory description of the feature for clarification	interest	interest		SPA bird populations dependency on specific habitats		Ramsar criteria applicable to specific habitats			
			SSSI designated interest features	SAC designated features	Annex 1 species	Migratory species	Waterfowl assemblage	1a Wetland characteristics	2a Hosting rare species &c	3a 20000 waterfowl	3c 1% of population
Bogs	M18 Erica tetralix- Sphagnum papillosum raised & blanket mire	Lowland raised bog	*	*							
	Invertebrate assemblage (Broad Assemblage Type: W31 permanent wet mire Specific Assemblage Type: W312 acid mire)	High quality invertebrate assemblage including scarce species with high habitat fidelity	*								
	Breeding Bird Assemblage: number of breeding species and aggregate BTO score	Site meets the BTO threshold score for lowland heath, scrub, woodland and lowland grassland.	*								
	Aggrigations of breeding birds: Nightjar	Supports >1% UK breeding population	*		*						*
Lowland Grassland	Rhinanthus angustifolius (Geater Yellow Rattle)	Population of schedule 8 plant included as a discretionary feature									

NB. Features where asterisks are in brackets (*) indicate habitats which are not notified for specific habitat interest (under the relevant designation) but because they support notified species.

Table 2 Habitat extent objectives

Conservation Objective for	To maintain the designated features in favourable condition, which is defined in part in relation to a balance of habitat extents (extent attribute). Favourable condition is defined at this site in terms of the following site-specific standards.
habitat extent	
Extent - Dynamic	On this site favourable condition requires the maintenance of the extent of each habitat type (either designated habitat
balance	or habitat supporting designated species). Maintenance implies restoration if evidence from condition assessment suggests a reduction in extent.

Habitat Feature (BAP Broad	Estimated extent (ha)	Site Specific Target	Comments
Habitat level, or more	and date of data	range and Measures	
detailed level if applicable)	source/estimate		
Bogs	1817 ha peat soils Estimated from GIS maps and air photos 2002.	No reduction in area of peat soil Area assessed from air photographs and structured walks	Area based on extent of peat soils. The site also includes 97 ha of lagg fen and warp land (grassland and woodland) which are hydrologicaly contiguous and contain supporting habitats. (see map 2). The site also includes a number of trackways built from basic slag and limestone. The area of these needs to be assessed.

Audit Trail
Rationale for habitat extent attribute
(Include methods of estimation (measures), and the approximate degree of change which these are capable of detecting).
Rationale for site-specific targets (including any variations from generic guidance)
Other Notes

Table 2a Species population objectives

Conservation Objective	To maintain the desigated species in favourable condition, which is defined in part in relation to their population
for species populations	attributes. Favourable condition is defined at this site in terms of the following site-specific standards.
Population balance	On this site favourable condition requires the maintenance of the population of each designated species or
	assemblage. Maintenance implies restoration if evidence from condition assessment suggests a reduction in
	size of population or assemblage.

Species Feature (species or assemblage)	List supporting BAP Broad Habitats	Population Attribute (eg presence/absence, population size or assemblage score)	Site Specific Target range and Measures (specify geographical range over which target applies ie site, BAP broad habitat or more specific)	Comments
Invertebrate assemblage (Broad Assemblage Type: W31 permanent wet mire Specific Assemblage Type: W312 acid mire)	Bogs	Direct Monitoring of assemblage score based on presence/ absence of specified proportion of species typical of habitat listed in ISIS	Monitor the assemblage once in every 6 year monitoring cycle Using defined invertebrate sampling protocols, threshold to be met: W312 acid mire: Weighted Species Score: 6	Hatfield Moors are not currently covered by any specific invertebrate monitoring schemes. Regular monitoring needs to be secured. This attribute is to be assessed via direct monitoring through specialist survey at least once in every 6 years.

Aggrigations of breeding birds: Nightjar	Bogs	Direct monitoring of breeding pairs by counting churring males	Monitor churring males annualy. 5 Year mean should be stable or increasing and should not be below 35 (47 minus 25%)	2005-2008 mean is 47 (peak 56). This has risen after falling in the early 00s from 40 (peak 45) between 1986 and 1990. This baseline figure (47) has been selected as it is the closest data available to the population at designation (1986). Some earlier data exists but is of doubtful accuracy. However this does not take into account wider population fluctuations and needs to be reviewed in the
		No overall loss of habitat extent	Monitor extent of nightjar habitat, loss of greater than 5% unacceptable. Baseline of habitat needs to be assessed	light of fluctuations in the UK population. No baseline has been set, and the assessment of appropriate habitat is difficult. The site is changing, with habitat being gained (through management and restoration) as well as being lost (to inundation) and there have been huge changes (loss of habitat) since notification.

	Maintain habitat mosaic	xxx% of open ground with predominantly low vegetation (feeding), bare patches (nesting) and sparse scrub cover (feeding, roosting) from reference level. Once a reference level has been established then there should be no significant reduction in extent from that level. This needs to take account of the both the SAC and SPA objectives (see comments).	Nightjar require vegetation mostly of 20-60cm (feeding) with frequent bare patches of >2sq.m, 10-20% bare ground (nesting) and ideally <30% tree/scrub cover overall (feeding and roosting). Some loss of trees and scrub is required/acceptable; >30% birch is considered unfavourable to meet SAC targets and areas of dense scrub are also unsuitable for nesting Nightjar. Raised bog restoration should take account of key nesting and foraging areas. Areas of bog with less dense tree and scrub cover, that support nesting nightjar, should be retained. Key foraging areas include edges of deciduous scrub. Not all edges are equally valuable to nightjar and so their retention should not prejudice the bog and nightjar nesting habitat restoration targets. N.B. dense scrub/ woodland not used for nesting but used by nightjar for foraging and roosting is likely to support similar or higher nightjar densities and a range of other European interests if restored to raised bog with scattered scrub. Methodology for assessing target to be determined. Reference levels (i.e. proportion of SPA with appropriate vegetation heights) to be determined.
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Breeding Bird Assemblage: number of breeding species and aggregate BTO score	Lowland heathland	Number of breeding species BTO Score	Maintain assemblage diversity. Bird numbers at notification are not available so no baseline set. Historic data needs to be examined to set appropriate baseline. The management plan gives BTO scores at or above habitat thresholds for lowland heath, scrub, woodland and damp lowland grassland. These scores should not fall below 75% of the thresholds.	If the total score or the total number of breeding species calculated for a breeding bird assemblage falls by the equivalent of 25% or more in points then the assemblage is in unfavourable condition Record presence/absence of breeding species within the assemblage. Methods of survey will be a combination of those given in Part 2 depending on the species within the assemblage. Breeding must be confirmed as proven or probable according to generic proof of breeding codes. A count of the numbers of breeding pairs/units in a site is not needed. On the basis of presence/absence recalculate the assemblage score using the 1983 SSSI Guidelines for the relevant habitat. The species present at designation and each monitoring event do not need to be the same as this is a score-based assessment only.
Rhinanthus angustifolius (Geater Yellow Rattle)	Grassland	Presence/absence	Species should be present. Identification of species	

Niche availability	Sufficient area of suitable habitat to maintain population.	Extent of population is not known and needs to be assessed.
	Mapping (area of grassland)	

Audit Trail

Rationale for species population attributes

(Include methods of estimation (measures), and the approximate degree of change which these are capable of detecting).

Rationale for site-specific targets (including any variations from generic guidance)

Yellow rattle is included as a discretionary feature, failure of targets for this species will not result in an adverse condition for the notified features of the site.

Objectives for Greater Yellow rattle do not follow the guidance in that the grassland feature is not assessed. Direct assessment of the plant has been selected as the plant is an introduced species and the grassland present is an incidental result of historic management (drainage and introduction of basic hardcore for tracks). This habitat will be lost over parts of the site as the bog habitat recovers, but some areas will remain which should be sufficient to retain an acceptable population of this plant. The extent of the population and the extent of retainable long term habitat need to be assessed.

Other Notes

Table 3 Site-Specific definitions of Favourable Condition [insert separate Table 3 for each BAP broad habitat]

CONSERVATION						
OBJECTIVE	FOR THIS					
HABITAT / G	EOLOGICAL					
SITE-TYPE						

To maintain the **Bog** habitat at **Hatfield Moors** in favourable condition, with particular reference to relevant specific designated interest features. Favourable condition is defined at this site in terms of the following site-specific standards:

Site-specific details of any geographical variation or limitations (where the favourable condition standards apply)

The bog habitat on the site is described as M18, but is badly degraded as a result of peat cutting, and has lost most of the former lag fen which historically surrounded the site. However the target is to restore the site to favourable condition for M18 and its associated features.

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA?
M18 Erica tetralix- Sphagnum papillosum raised & blanket mire	Habitat composition	A baseline map, showing the boundary of the bog and any associated lagg fen, should be used to assess any changes in extent. Aerial photographs can offer a convenient means of rapidly assessing extent. Mire expanse is taken as the extent of peat soils, supporting habitats are taken as lagg. (see Map 2)	No loss of the following specific components of the wetland: mire expanse, lagg.	'Bog' is taken here to be the peat deposit together with typical bog vegetation, irrespective of the precise nature and condition of that vegetation. 'Lagg' comprises both former peat deposit and vegetation, irrespective of nature and condition. There was no detailed NVC survey at the time of notification; as a result the vegetation communities cannot be separated for measurement. However, the notification documents and informal survey suggests the predominant peatland community present was the M18 <i>Erica tetralix-Sphagnum papillosum</i> mire although there is likely to be a mix of bog communities due to changes in	Yes

				hydrology and vegetation since notification.	
M18 Erica tetralix- Sphagnum papillosum raised & blanket mire	Habitat structure	Aerial photographs can offer a convenient means of rapidly assessing these. It may also be necessary to make a visual assessment using a structured walk or transects.	There should be no obvious modification to structural features (e.g. vegetation cover, surface patterning and natural drainage), in relation to the established baseline. Total extent of the exposed substrate across the area assessed should be no more than 10%.	The surface of Thorne Moor has been extensively modified by human activity, with no pristine surface remaining. Manmade features (such as drains, bunds, baulks and cuttings etc.) may mimic more natural pools and hummocks. A formal baseline needs to be established taking this factor into account.	YES
M18 Erica tetralix- Sphagnum papillosum raised & blanket mire	Vegetation composition: positive indicators - vascular plants	Visual assessment of cover and frequency, using structured walk or transects and recording quadrats	Targets for the mire expanse only: (1) At least 3 of Calluna vulgaris, Erica tetralix, Eriophorum angustifolium, E. vaginatum & Trichophorum cespitosum constant, with a combined cover not exceeding 80%; (2) no single species > 50% cover; (3) At least one of Andromeda polifolia, Drosera rotundifolia, Empetrum nigrum, Narthecium ossifragum and Vaccinium oxycoccos at least frequent	The vegetation of the mire expanse should comprise an inter-mix of bryophytes (predominantly Sphagnum spp), graminoids and dwarf shrubs, with no one group dominating at the expense of others on 'active' sites. Although Sphagnum may predominate on hyper-oceanic sites.	Yes

Sphagnum capillifolium, S. magellanicum, S. papillosum, S. tenellum (2) Sphagnum cuspidatum and/or S. pulchrum at least occasional occasional indicator for year-round high water table position. Sphagnum cuspidatum present in at least 10% of quadrats, or at least occasional indicates 'unfavourable recovering' condition, where the other targets are not achieved.
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M18 Erica tetralix- Sphagnum papillosum raised & blanket mire	Vegetation composition: indicators of negative change - non- woody vascular plant species	Visual assessment of cover, using structured walk or transects and recording quadrats	(1) No more than 1% cover of the following on the bog surface (subject to exceptions in comments column): Phragmites australis, Phalaris arundinacea, Glyceria maxima, Epilobium hirsutum, Urtica dioica, Pteridium aquilinum, Rubus fruticosus, Juncus effusus, Deschampsia cespitosa, Cirsium spp. (2) Invasive non-native plant species should be absent or no more than rare (if present at baseline)	This target applies to the whole bog, not just the mire expanse. The plants listed are indicators of enrichment or of drying out of the bog. <i>Phragmites</i> is acceptable around upwellings or their equivalent along former ditchlines.	Yes
M18 Erica tetralix- Sphagnum papillosum raised & blanket mire	Vegetation composition: indicators of negative change - bryophytes	Visual assessment of cover, using structured walk or transects and recording quadrats	Polytrichum spp. Other than P. alpestre no more than occasional		Yes

M18 Erica tetralix- Sphagnum papillosum raised & blanket mire	Vegetation composition: indicators of negative change – undesirable woody species	Visual assessment of cover of the whole feature, using structured walk or transects Aerial photography may be a useful aid though not for seedlings.	On the mire expanse, trees and shrubs (<i>Betula, Salix, Rhododendron, Pinus</i> species, other gymnosperms no more than rare and <5% cover On the bog margin (rand) woody species <10% cover	Invasion by woody species and their development to healthy maturity may indicate drying out and/or enrichment. Trees and shrubs will exacerbate drying out. Salix spp. and Myrica gale can occur on raised bogs, but scrub generally constrains itself to areas where it receives a source of nutrients (e.g. near water that has passed through or over a mineral soil). As a result, it often is found close to or on the 'rand' of the raised bog, where it is more acceptable.	Yes
M18 Erica tetralix- Sphagnum papillosum raised & blanket mire	Indicators of local distinctiveness – microtopography*	% length of transects intersecting bog pools or other microtopographic features.	No reduction in extent of microtopographic features (e.g. bog pools). Due to highly modified nature of the bog surface man-made features may have to stand in for natural microtopograhic features. Baseline needs to be set.	The quality of microtopographic features may also be assessed by providing a definition of target composition – for example, for a bog pool to count as such it could be defined as having little cover of living dwarf shrubs or <i>Eriophorum vaginatum</i> ; a complete or extensive cover of <i>sphagna</i> with <i>S. pulchrum</i> and/or <i>S. cuspidatum</i> predominant. Some open water or bare peat may be present.	Disc
M18 Erica tetralix- Sphagnum papillosum raised & blanket mire	Indicators of local distinctiveness * e.g.rare/scarce spp	Visual assessment of frequency/cover of rare/scarce/local species in sample points chosen to represent their known distribution. Aerial photographs may offer a convenient means of rapidly assessing these.	 Existing populations of rare/scarce species are maintained eg: Royal fern, Bog rosemary, and S pulchrum. Community and habitat transitions are maintained at current levels and in current locations. 	This attribute is intended to cover any site-specific aspects of this habitat feature (forming part of the reason for notification) which are not covered adequately by the previous attributes, or by separate guidance (e.g. for notified species features). Targets need to be determined for this atribute.	Disc

Invertebrate assemblage of wet heath/mires	Vegetation heterogeneity Diverse surface topography of vegetation types	Record Structural Recording Surveys (SRS) of 6m radius at sample stops to determine number of structural surfaces and representation of preferred surfaces within the assessed unit.	Single surface present in no more than 50% of SRSs >2 different surfaces present in at least 20% of SRSs Medium shrubs present in <30% and at least 5% of SRSs Preferred surfaces for this site are: Surface 1: Early successional surfaces, peats, lichen/bryophyte cover: Cladonia spp, Sphagnum Surface 3: Ericaceous shrub layer: Calluna vulgaris, Erica tetralix Surface 4: Medium shrub layer: low birch scrub	Preferred features are microhabitat features which should always be targeted during an assessment. These should be recorded and mapped. Preferred features for Thorne Moors are: Scrub margins usually birch with some willow Pools (including ditches/cuttings) and their margins Areas of bare wet peat Concentrations of Erica tetralix Sphagnum tussocks, lawns and sumps Transitions to dry heath Flowery areas, including those other habitats (verges, ruderal, etc) including "unwelcome" weeds such as ragwort and thistles (although these would need to be kept under control and not invade the mire habitat Medium shrubs may include young birch which is likely to be targeted for removal in order to benefit the bog condition, but within units some cover should be retained to meet the minimum requirement (5%).	Yes
Invertebrate assemblage of wet heath/mires	Unit based: Vegetation heterogeneity	Record the frequency and % cover of all tree and scrub species, considered	Less than 10% scrub cover of unit	Negative features: ■ >10% scrub cover ■ Invasive species: common	Yes

	Scrub	together. Visual assessment of cover of the whole unit, using structured walk or transects Aerial photography may be a useful aid though not for seedlings.		scrub species sallow, birch, Rhododendron	
Invertebrate assemblage of wet heath/mires	Early successional surfaces horizontal ('bare' soil)	Record % cover of bare wet peat. Visual assessment of cover of the whole unit, using structured walk or transects	No more than 10% of areas of bare wet peat in unit	Preferred features: Areas of bare wet peat	Yes
Invertebrate assemblage of wet heath/mires	Early successional surfaces Peats, lichen/bryophyt e cover	Record % cover of typical species. Visual assessment of cover of the whole unit, using structured walk or transects	Cladonia spp, Sphagnum spp present in 5-10% of SRSs	 Preferred features: Sphagnum tussocks, lawns and sumps Pools and their margins Negative features: Considerable green algal cover in pools and on bare peat 	Yes
Invertebrate assemblage of wet heath/mires	Cover - Dead organic matter <u>litter</u>	Record % cover of sward with litter layer Visual assessment of cover of the whole unit, using structured walk or transects	Between 10-25% litter cover (grass/sedge/heather litter) present in unit of >1cm depth (but not bracken or <i>Molinia</i>).	Negative features: Dominance of Molinia or Juncus	Yes
Invertebrate assemblage of wet heath/mires	Cover - Seed Heads	Record percentage occupation of seed heads and broken stems able to over-winter (ideally recorded in winter)	Unit surface with >15% of seed heads over winter.	Over-wintering seed heads and erect and fallen hollow stems of herbaceous plants are often important for over-wintering eggs and pupae.	Yes
Invertebrate assemblage of wet heath/mires	Nectar sources (see floweriness table)	Record percentage occupation of sward able to flower throughout the year.	At least 40% of the unit sward is able to flower in the season	Open structured flowers are most important eg: umbellifers, daisies, hawthorn and bramble. "Weed" species such as ragwort & thistles also provide an important nectar	Yes

				source at times of the year when many other plants are not in flower. However, at Thorne Moors it is anticipated that the majority of nectar sources will be found in the positive bog/heath species eg: Calluna vulgaris, Erica tetralix, Eriophorum vaginatum E angustifolium.		
				angustiioiium.		
Audit Trail						
Rationale for limiting star	ndards to spec	ified parts of the site				
Rationale for site-specific targets (including any variations from generic guidance) Some targets have been changed to reflect the highly modified structure of the bog.						
Rationale for selection of measures of condition (features and attributes for use in condition assessment) (The selected vegetation attributes are those considered to most economically define favourable condition at this site for the broad habitat type and any dependent designated species).						
Other Notes						

Annex 1 Maps



Thorne, Crowle and Goole Moor SSSI

Map 1 Designation boundaries

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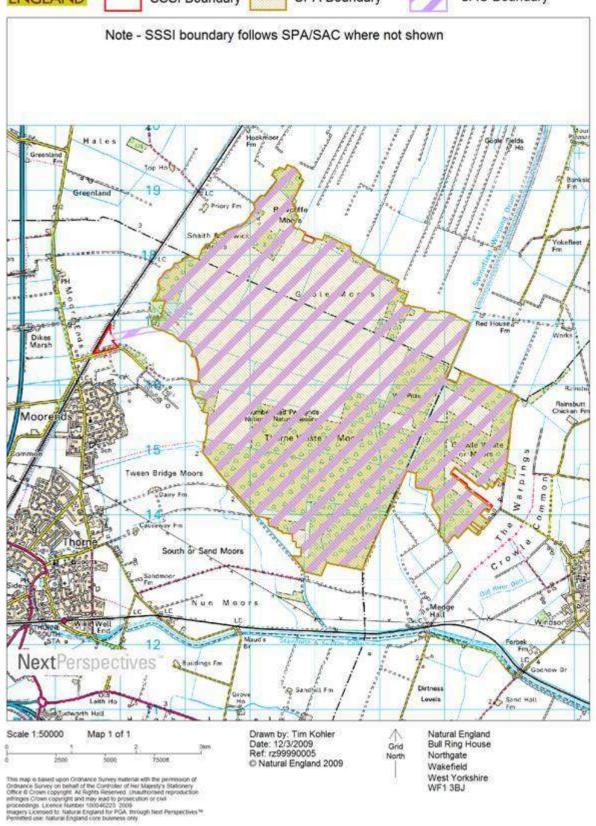
SSSI Boundary



SPA Boundary



SAC Boundary





Thorne, Crowle and Goole Moors SSSI Map 2 Habitat Areas

