

Appendix 2

Natural England River Mease Conservation Objectives

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.

Lincolnshire, Leicestershire & Northamptonshire Team
The Maltings, Wharf Road
Grantham. NG31 6BH
01476 584800
01476584838

East.midlands@naturalengland.org.uk

Name of Site of Special Scientific Interest (SSSI)	
River Mease SSSI	
Names of designated international sites	
Special Area of Conservation (SAC)	River Mease SAC
Special Protection Area (SPA)	
Ramsar	
Relationship between site designations	

Version control information		
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	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)

Rivers and streams

Geological features (Geological Site Types)

(*) 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

Table 1 Individual designated interest features

BAP Broad Habitat type / Geological Site Type	Specific designated features	Explanatory description of the feature for clarification	SSSI designated interest features	SAC designated interest features	SPA bird populations dependency on specific habitats			Ramsar criteria applicable to specific habitats			
					Annex 1 species	Migratory species	Waterfowl assemblage	1a Wetland characteristics	2a Hosting rare species &c	3a 20000 waterfowl	3c 1% of population
Rivers and streams	Water courses of plain to montane levels with <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation	Slow flowing lowland river	(*)	*							
	Bullhead, <i>Cottus gobio</i>	Presence of bullhead	*	*							
	Spined Loach, <i>Cobitis taenia</i>	Presence of spined loach	*	*							
	Otter, <i>Lutra lutra</i>	Presence of otter		*							
	White clawed crayfish, <i>Austropotamobius pallipes</i>	Presence of white clawed crayfish		*							

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 habitat extent	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:
Extent - Dynamic balance	On this site favourable condition requires the maintenance of the extent of each habitat type (either designated habitat or habitat supporting designated species). Maintenance implies restoration if evidence from condition assessment suggests a reduction in extent.

Habitat Feature (BAP Broad Habitat level, or more detailed level if applicable)	Estimated extent (ha) and date of data source/estimate	Site Specific Target range and Measures	Comments
River	Extent =22.87ha	No reduction in area and any consequent fragmentation without prior consent	Recoverable reduction = unfavourable; non-recoverable reduction = partially destroyed.

Audit Trail
Rationale for habitat extent attribute (Include methods of estimation (measures), and the approximate degree of change which these are capable of detecting).
Habitat extent estimated using GIS software and aerial photographs 2001.
Rationale for site-specific targets (including any variations from generic guidance)
Other Notes

Table 2a Species population objectives

Conservation Objective for species populations	To maintain the designated species in favourable condition, which is defined in part in relation to their population 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	List supporting BAP Broad Habitats	Population Attribute	Site Specific Target range and Measures	Comments
Bullhead	Rivers and streams	Population	Single-pass electrofishing in August / September. Data analysis as in a-c. below. see sub-attributes below	For details see the LIFE in UK Rivers Project protocol
Bullhead	Rivers and streams	a. Adult population densities	Density estimates There should be no reduction in densities from existing levels, and in any case no less than 0.5 m ⁻² in lowland rivers (source altitude ≤100m).	Routine Environment Agency monitoring is not capable of providing suitable data. A least-cost methodology for monitoring this attribute has been developed by the LIFE in UK rivers project, involving the sampling of representative reaches within an SAC.
Bullhead	Rivers and streams	c. Reproduction/ Age Structure	Length-frequency analysis of selected samples Young-of-year fish should occur at densities at least equal to adults. Four age classes with 0+ individuals at least 40% of population Largest females attain a fork length >75mm	Young-of-year fish should be easily identifiable using length-frequency analysis. In September they are typically less than 30 mm long. Young-of-year are often much more numerous than adults, so the current target is rather conservative (to allow for natural variation in recruitment and habitat type). A ratio of 3 or 4:1 for Y-O-Y: adults is not unusual. It may be necessary to refine this target at a site-specific level.

Species Feature	List supporting BAP Broad Habitats	Population Attribute	Site Specific Target range and Measures	Comments
Bullhead	Rivers and streams	b. Distribution within SAC	<p>GIS analysis of distribution within catchment</p> <p>Bullheads should be present in all suitable reaches. As a minimum, no decline in distribution from current.</p>	<p>In the UK, bullhead are widespread in any flowing water at an altitude of less than 300 m. Well oxygenated water over a gravel / pebble / cobble substrate is preferred (and is essential for successful reproduction). Riffles are a favoured microhabitat. Very sluggish water with a clay / silt substrate or cold, steep-gradient upland sections with numerous cascades and boulder / bedrock substrate should be viewed as sub-optimal. Bullheads can occur in very small channels (<1 m wide) where they may be the only fish species present. Bullhead are very poor colonists, to the extent that catchments may contain many individual subpopulations. It is not feasible to assess each of these individually, but it is very important that there is no loss of these populations, and that access routes between them are not impeded (see environmental disturbance notes below).</p>
Spined loach	Rivers and streams	Population	<p>Electrofishing in rivers, hand trawl in drains.</p> <p>There should be no reduction in densities from existing levels, and in any case no less than 0.1 m⁻²</p>	<p>Routine Environment Agency monitoring is not capable of providing suitable data. A least-cost methodology for monitoring this attribute is being investigated, involving the sampling of representative reaches within an SAC.</p>
Spined loach	Rivers and streams	Age structure	<p>Adult population densities >0.2/m</p> <p>At least three year-classes should be present at significant densities. At least 40% of the population should consist of 0+ fish</p> <p>Largest females attain a fork length >85mm</p>	
Otter	Rivers and streams	Otter population – inland waterways	<ul style="list-style-type: none"> • Otters present on site. • Population maintained or increasing. 	<p>Use LRR SAC monitoring scheme for river SACs in England, Wales and Northern Ireland. Annual survey recommended for first 5 years of LRR method.</p>
White-clawed crayfish	Population Density	Trapping using baited small mesh traps (<8mm) in	Population of at least moderate abundance (CPUE between 0.1 - 1)	<p>Insufficient data are available on typical densities for standing water bodies to set reliable targets. Population density is considered best expressed as catch per unit effort (CPUE) –</p>

Species Feature	List supporting BAP Broad Habitats	Population Attribute	Site Specific Target range and Measures	Comments												
		areas of favourable crayfish habitat. Trapping in conjunction with night viewing and hand searching where possible.	Berried females should be present during the period November to April	<p>catch per trap night. A provisional qualitative scale is as follows:</p> <table><tr><td>CPUE Av. no. crayfish /trap night</td><td>Relative abundance of population</td></tr><tr><td><0.1</td><td>moderate-low abundance</td></tr><tr><td><1</td><td>moderate abundance</td></tr><tr><td>1-2.5</td><td>moderately high abundance</td></tr><tr><td>2.6-4</td><td>high abundance</td></tr><tr><td>>4</td><td>Very high abundance</td></tr></table> <p>This is likely to require some refinement once more surveys have been carried out and compared on a wide range of sites across England and Wales.</p> <p>It is accepted that crayfish densities may fluctuate naturally and thus caution should be taken in determining the condition of the site.</p> <p>Nevertheless, the site should be considered unfavourable if there is a dramatic reduction in density.</p>	CPUE Av. no. crayfish /trap night	Relative abundance of population	<0.1	moderate-low abundance	<1	moderate abundance	1-2.5	moderately high abundance	2.6-4	high abundance	>4	Very high abundance
CPUE Av. no. crayfish /trap night	Relative abundance of population															
<0.1	moderate-low abundance															
<1	moderate abundance															
1-2.5	moderately high abundance															
2.6-4	high abundance															
>4	Very high abundance															
White-clawed crayfish	Population densities and health	Determined during population monitoring	Thelohaniasis (Porcelain Disease) should not affect >10% population.	This disease rarely causes mass mortalities and may be present in a population at low levels without apparent harm. However, a prevalence exceeding 10% is of concern.												
White-clawed crayfish	Population densities and health	Determined during population monitoring	Absence of individuals infected with crayfish plague	<p>Crayfish plague can be introduced by the entry of non-native crayfish species into a site, but also by a variety of other routes, including contaminated equipment (nets, boots, etc.) and stocked fish from infected waters¹.</p> <p>Outbreaks of crayfish plague typically result in 100% mortalities, unless there are isolated headwaters with crayfish in the catchment. This target requires that the utmost care be</p>												

Species Feature	List supporting BAP Broad Habitats	Population Attribute	Site Specific Target range and Measures	Comments
				<p>taken in terms of fish stocking and general surveying/monitoring to ensure that plague vectors are not introduced.</p> <p>Disinfection or thorough drying of equipment (or perhaps dedicated equipment for use only in native crayfish rivers) and stocking fish from uninfected waters are vital elements.</p> <p>Nationally agreed EN/EA policy on stocking fish into crayfish SSSIs/SACs should prevent stocking from catchments containing signal crayfish or known to have experienced plague.</p>

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)
Other Notes

Table 3 Site-Specific definitions of Favourable Condition

CONSERVATION OBJECTIVE FOR THIS HABITAT / GEOLOGICAL SITE-TYPE	To maintain the Rivers and streams at this site 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)	
These targets apply to the river and marginal vegetation only.	

Site-specific standards defining favourable condition

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
Water courses of plain to montane levels with <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation Spined loach Bullhead	Habitat structure: substrate	Field observations	<p>Siltation</p> <p>No excessive siltation. Maximum silt content <20% in top 10cm of mid-channel gravels</p> <p>Channel should be dominated by clean gravels</p> <p>Spined loach: Sand fractions in finer substrates reach at least 20% sand and no more than 40% silt</p> <p>Bullhead: No excessive siltation on the surfaces of coarse substrates</p>	<p>Siltation levels vary naturally, depending upon the reach type and hydrodynamic regime. Most sites should have a variety of channel substrates. Localised accumulations of silt on the inside of bends or in back channels do not necessarily indicate a problem.</p> <p>However, widespread siltation of riverine sediments, caused by high particulate loads and / or reduced scour within the channel (due to artificial channel modifications, is a major threat to interest features.</p> <p>Many characteristic species of fish, invertebrates and even plants are susceptible to siltation at some stage in their life-cycle. Mechanisms of impact can relate to reduced interstitial spaces in coarse substrates, reduce water flow-through the substrate leading to poor quality of interstitial waters, and reduced sediment surface 'roughness' that eliminates refugia for animals with epibenthic habitats and prevents plant seeds and fragments from lodging in the substrate and taking root.</p> <p>Sources of silt include run-off from agricultural land, sewage and industrial discharges. A fluvial audit is recommended where specific problems have been identified, e.g. where there is a perceived risk of damage occurring or where species characteristic of the habitat are</p>	Yes

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
				<p>already believed to be in decline.</p> <p>Spined loach can tolerate silt and mud, it has a preference for sandy substrates, and these substrates should be maintained and/or restored in watercourses where sufficient hydraulic energy can be generated. If the organic content becomes too high, reduced oxygen availability near the sediment/water interface may lead to enhanced egg and juvenile mortality. High sediment cohesiveness is likely to affect the feeding process.</p> <p>Elevated silt levels can interfere with egg and fry survival in bullhead.</p>	
<p>Water courses of plain to montane levels with <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation</p> <p>Bullhead</p> <p>Spined loach</p>	Habitat structure: channel and banks	<p>Assess river morphology using RHS (see text and Appendices 4 and 5 of the JNCC CSM Guidelines for Rivers, March 2005).</p> <p>In addition, for planform: map data, aerial survey data, historical records and local knowledge.</p>	<p>Channel form Channel form should be generally characteristic of river type, with predominantly unmodified planform and profile.</p> <p>For planform the target is a score for the assessment unit of at least 3 (see Appendix 4 of the JNCC CSM Guidelines for Rivers, March 2005) i.e <10% of ECS river artificial, re-aligned or constrained.</p> <p>For naturalness of the profile using transect data the target is a score for the assessment unit of 4 or 5 (see Appendix 5 of the JNCC CSM Guidelines for Rivers, March 2005). i.e <0.2</p> <p>No RHS site to have any of the eight categories of bank profile modification (Section I in RHS</p>	<p>The river should support all of the habitat features necessary for characteristic flora and fauna to thrive, in characteristic proportions. Widening or deepening of channels, and extensive artificial reinforcement of banks, are indicators of unfavourable condition. Headwater sections are particularly vulnerable to reprofiling.</p> <p>Watercourses with a high degree of naturalness will be governed by dynamic processes which result in a variety of physical habitat features, including a range of substrate types, variations in flow, channel width and depth, in-channel and side-channel sedimentation features, erosion features and both in-channel and bankside vegetation cover.</p> <p>The new version of Habitat Modification Score (HMS) enables a more sophisticated assessment to be made, based on the nature of modifications to a river and their estimated persistence. Details are being finalised by the Environment Agency, but a guideline target might be 90% or more of condition monitoring sites should fall within the <i>semi-natural</i> HMS class 1, with the remainder <i>predominantly unmodified</i> (class 2).</p> <p>Spined loach :A natural channel morphology provides the diversity of breeding/nursery habitat, cover from predators, refuge against high flows, and feeding opportunities that best meet the full life cycle</p>	Yes

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
			<p>2003 form) recorded as 'extensive'.</p> <p>In-channel natural features present at frequent intervals (such as riffle/pool sequences, pools, slacks and submerged tree root systems)</p>	<p>requirements of the species. The close proximity of riffles and pools is particularly important for this sedentary animal. Operations that widen, deepen and/or straighten the channel reduce variations in habitat. New operations that would have this impact are not acceptable within the SAC, whilst restoration <i>may/will</i> be needed in some reaches.</p>	
Water courses of plain to montane levels with <i>Ranunculon fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation	Plant community: reproduction	<p>Field observations during annual macrophyte survey.</p> <p>Mapping of flowering <i>Ranunculus</i> in sample sections every 3 years.</p>	<p>A sufficient proportion of all aquatic macrophytes should be allowed to reproduce in suitable habitat, unaffected by river management practices.</p> <p><i>Ranunculus</i> should be able to flower and set seed.</p>	<p>Flowering outside the normal period and weed cutting or other activities that do not leave patches of plants to flower (at least 25% in every 100m of river) and set seed are indicators of unfavourable condition.</p> <p>25% of the total habitat / macrophyte population should be left uncut for the full duration of the growing season.</p> <p>Use of herbicides should be avoided.</p>	Yes
Water courses of plain to montane levels with <i>Ranunculon fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation	Negative indicators: native species	<p>Survey the macrophytes of representative stretches at intervals of ca. 5 km, using the method of Holmes (1983) and a standard check-list of macrophyte species (see Appendix 2 of the JNCC CSM Guidelines for Rivers, March 2005).</p>	<p>For blanketweed, epiphytic or other algae, <i>Potamogeton pectinatus</i> or <i>Zannichellia palustris</i>:</p> <p>Cover values over 25% should be considered unfavourable, and should trigger further investigation.</p> <p>Cover values should not increase significantly from an established baseline.</p> <p>ii) For taxa with STRs as follows: For taxa with STR values of 1 or 2, cover values</p>	<p>Taxa typically associated with enrichment are considered negative indicators of favourable condition. The species will vary depending on the River Community Type. Species that are characteristic of enrichment, or have atypically low Species Trophic Ranks (STRs) in the Mean Trophic Rank (MTR) system (Holmes et al., 1999) and that are recorded as dominant (3), are used as indicators. Note: in using MTR, each species is allocated a score dependent on its tolerance to eutrophication; this system cannot be used to assess acidification.</p> <p>Expert judgement will be important in assessing the ecological significance of cover values of these species. At some sites, it may be appropriate to set more stringent targets. Occasionally thresholds may need to be raised, according to wider conservation objectives.</p> <p><i>Alien species are assessed within the Negative indicators: alien/introduced species attribute instead.</i></p>	

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
			<p>over 25% should be considered unfavourable, but should trigger further investigation.</p> <p>Cover values should not increase significantly from an established baseline.</p>		
Water courses of plain to montane levels with <i>Ranunculon fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation	Negative indicators: alien/introduced species	<p>For aquatic and marginal macrophytes the presence of alien species listed in Appendix 10 of the JNCCCSM Guidelines for Rivers, March 2005 should be noted during the macrophyte survey and the scoring system for naturalness applied.</p> <p>For other organisms contact external organisations (e.g. EA, SEPA, EHS, fisheries trusts and boards) for local reports on alien or introduced species.</p>	<p>No impact on native biota from alien or introduced macrophyte species</p> <p>Aquatic and marginal macrophytes The mean SERCON score for naturalness (derived from individual survey sites) should be 4 or 5 (see Appendix 10 of the JNCCCSM Guidelines for Rivers, March 2005). i.e >95% of aquatic and marginal macrophyte sp are native</p> <p>No other alien/introduced species present at levels likely to be detrimental to the characteristic biological community.</p>	<p>Non-native species constitute a major threat to many river systems. For example, species such as signal crayfish have been responsible for much of the decline of native crayfish through competition, habitat damage and the introduction of crayfish plague. Note: 'Introduced species' include species that are native to the UK but outside of their natural range.</p> <p>The SERCON scoring system for naturalness of aquatic and marginal macrophytes is used to assess alien plant species.</p> <p>Note: This protocol applies to negative indicator species of the channel and channel margins. Negative indicator species found on banks and the riparian zone are assessed as part of the naturalness of banks and naturalness of riparian zone assessment and form part of the CSM structure attribute</p> <p>Expert judgement will be needed to determine whether there is sufficient evidence to generate an unfavourable condition assessment. For example, for signal crayfish, presence alone would constitute unfavourable condition. Other species, such as barbel, can be tolerated at low levels; higher levels would constitute unfavourable condition.</p>	Yes

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
Water courses of plain to montane levels with <i>Ranunculon fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation White-clawed crayfish Bullhead Spined loach	Negative indicators: In-stream barriers	Strategic assessment of barriers affecting the characteristic species of the SSSI.	No artificial barriers significantly impairing characteristic migratory species from essential life-cycle movements.	<p>Barriers may take the form of weirs, barrages or intakes/off-takes that entrain characteristic species. Species may be anadromous (e.g. salmon), catadromous (e.g. eels) or migrate over relatively short distances within the river system (e.g. bullhead, brook lamprey and invertebrates without flying life stages).</p> <p>A range of data sources may be used and brought together to make this assessment. Specific studies may be required in relation to some barriers where impacts are uncertain and remedial costs are potentially high.</p> <p>Free movement within the channel is necessary to ensure maintenance of genetic diversity (and therefore population viability) and to provide the potential for recolonisation of waters that have become artificially denuded of spined loach.</p> <p>Vertical drops of >18-20 cm are sufficient to prevent upstream movement of adult bullheads. They will therefore prevent recolonisation of upper reaches affected by lethal pollution episodes, and will also lead to constraints on genetic interactions that may have adverse consequences.</p> <p>New instream structures should be avoided, whilst the impact of existing structures needs to be evaluated.</p>	Yes
Water courses of plain to montane levels with <i>Ranunculon fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation	Plant community: species composition and abundance	Survey the macrophytes of representative stretches at intervals of ca. 5 km, using the method of Holmes (1983) and a standard check-list of macrophyte species (see Appendix 2 of the JNCC CSM)	<p>(i) Species Composition</p> <p>The following should all occur for river type II</p> <ul style="list-style-type: none"> At least 60% of species with abundance V or IV in the constancy table should be present, <p>AND</p>	<p>Species with abundance V & IV: <i>Agrostis stolonifera</i>, <i>Cladophora/Rhizoclonium</i> agg., <i>Enteromorpha</i> sp. <i>Epilobium hirsutum</i>, <i>Glyceria maxima</i>, <i>Lemna minor</i>, <i>Leptodictyum riparium</i>, <i>Mentha aquatica</i>, <i>Myosotis scorpioides</i>, other tree species, <i>Persicaria amphibian</i>, <i>Phalaris arundinacea</i>, <i>Potamogeton pectinatus</i>, <i>Rorippa amphibian</i>, <i>Rorippa nasturtium-aquaticum/microphylla</i> agg., <i>Salix</i> spp, <i>Scrophularia auriculata</i>, <i>Solanum dulcamara</i>, <i>Sparganium emersum</i>, <i>Sparganium erectum</i>, <i>Vaucheria</i> sp., <i>Veronica beccabunga</i></p> <p>Species with abundance III: <i>Alisma plantago-aquatica</i>, <i>Apium nodiflora</i>, <i>Callitriche stagnalis</i>, <i>Filipendula ulmaria</i>, <i>Iris pseudacorus</i>,</p>	Yes

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
		<p>Guidelines for Rivers, March 2005).</p> <p>Evaluate the community against the target community in the constancy tables (Appendix 8 of the JNCC CSM Guidelines for Rivers, March 2005).</p> <p>Record measures of species composition and abundance on the form in Appendix 9 of the JNCC CSM Guidelines for Rivers, March 2005.</p> <p>Alien species, filamentous green algae (including <i>Cladophora</i>, <i>Vaucheria</i>, and <i>Enteromorpha</i>) and other species indicative of eutrophication are not included in these targets and are dealt with in separate targets below.</p>	<ul style="list-style-type: none"> At least 25% of species with abundance III should be present. <p>(ii) Loss of Species 60% of species with cover >1 in the initial baseline survey should be at least present and all species recorded as dominant in the initial baseline survey should still be present.</p> <p>(iii) Abundant Species At least 25-35% of species recorded as dominant in the initial baseline survey should still be recorded as dominant.</p>	<p><i>Juncus inflexus</i>, <i>Lycopus europaeus</i>, <i>Lythrum salicaria</i>, <i>Myosoton aquaticum</i>, <i>Myriophyllum spicatum</i>, <i>Nuphar lutea</i>, <i>Potamogeton crispus</i>, <i>Potamogeton perfoliatus</i>, <i>Ranunculus sceleratus</i>, <i>Sagittaria sagittifolia</i>, <i>Schoenoplectus lacustris</i>, <i>Symphytum officinale</i>.</p> <p>In-channel vegetation of SSSI/SAC rivers should be dominated by characteristic species. Species composition and abundance should be assessed using data from two 500 m stretches in each assessment unit where possible. When assessing targets (ii) and (iii), the data from all macrophyte survey sites in the assessment unit should be pooled and compared against pooled baseline data/reference condition.</p> <p>Cover values are expressed using a simplified DAFOR 3-point scale. Where necessary, 5-point scale data converts into the 3-point scale as follows: 5/4 = 3, 3 = 2, 2/1 = 1. Any sections classified as Type IV are considered to be in unfavourable condition.</p> <p>Comparisons in (ii) and (iii) should be made with the initial baseline survey/reference condition, not with survey data from the previous monitoring cycle.</p> <p>Non-native species are not considered under this attribute, but are covered under Negative indicators. Rare species are not considered under this attribute, but are taken account of under Indicators of local distinctiveness.</p> <p>Note that this component of the generic habitat FCT need not be applied to sectional river SSSIs designated for river habitat where the plant community is not a specific notified feature.</p>	
Bullhead	Negative indicators:	Assessment of stocking consents in	No artificial releasing of fish unless it is widely agreed that this	Many characteristic species can be affected by fish introductions, through increased predation, competition or genetic introgression, or	Yes

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
Spined loach	Fish introductions	relation to guidance on acceptable stocking levels.	<p>is in the best interests of the populations and then only with local stock.</p> <p>Fish introductions should not interfere with the ability of the river to support self-sustaining and healthy populations of characteristic species.</p>	<p>through disease transfer. Guidance is being generated on the levels of stocking deemed to be ecological acceptable within SSSIs.</p> <p>The presence of artificially high densities of salmonids and other fish will create unacceptably high levels of predatory and competitive pressure on juvenile and adult bullhead.</p> <p>Excessively high densities of predatory and benthivorous fish species can cause unacceptably high predation pressure and alter sediment characteristics and sedimentary food supply in ways that are highly detrimental to spined loach. Care needs to be taken to ensure that stocking exercises do not keep the densities of such species at unnaturally high levels.</p>	
<p>Water courses of plain to montane levels with <i>Ranunculon fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation</p> <p>White-clawed crayfish</p> <p>Bullhead</p> <p>Spined loach</p>	Habitat functioning: water quality (General assessments)	EA standard monitoring protocols	<p>Biological GQA Class 'A' / 'B' for all reaches of the river</p> <p>Chemical GQA Class 'A' / 'B' for all reaches of the river</p>	<p>A wide range of water quality parameters can affect the status of interest features, but standard biological monitoring techniques provide a reasonably integrated picture in relation to many parameters.</p> <p>The Biological Module of the Environment Agency's General Quality Assessment scheme is based on assessment of the macroinvertebrate community. All classified reaches within the site should comply with the targets given. The chemical module of the GQA scheme sets standards for dissolved oxygen, biochemical oxygen demand and total ammonia. It therefore covers a number of water quality parameters that commonly cause problems within river systems.</p> <p>Where modelling has been undertaken, the river should comply with the targets at all points along its length except within effluent mixing zones of acceptable size.</p> <p>Generally, water quality should not be injurious to any life stage. A wide range of water quality parameters can affect the status of interest features, but standard biological monitoring techniques provide a reasonably integrated picture in relation to many parameters.</p>	Yes

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
				All classified reaches within the site that contain, or should contain, crayfish under conditions of high environmental quality should comply with the targets given.	
Water courses of plain to montane levels with <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation	Habitat functioning: water quality	EA monitoring	Un-ionised ammonia <0.021 mg L ⁻¹ as a 95-percentile	The un-ionised form of ammonia is highly toxic to freshwater fauna. This target is the same as the EQS used by the EA. Where modelling has been undertaken, the river should comply with the targets at all points along its length except within effluent mixing zones of acceptable size.	Yes
Water courses of plain to montane levels with <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation Bullhead Spined loach	Habitat functioning: water quality	EA monitoring	Suspended solids No unnaturally high loads. Spined loach and bullhead: <25mg/litre annually	Many characteristic species of different river types are susceptible to elevated solids levels, through reduced light availability (for photosynthesis), the clogging of respiratory structures, impaired visibility or siltation of coarse substrates. Lowland clay and alluvial river sections are more depositional in character and resident biota are generally more tolerant. Suspended solids measurements are also essential to the estimation of particulate loads within the river network (in combination with gauged flow data), to provide an indication of the risk of siltation. Elevated levels of suspended solids can clog the respiratory structures of crayfish.	

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
				The target of <25 mg L ⁻¹ (annual mean) is based on the EC Freshwater Fish Directive. Most river SSSIs/ ASSIs and SACs do not extend to the entire catchment. Some life-cycle stages are potentially susceptible to damage from siltation, the source of which may lie elsewhere in the catchment outside the site boundary. Sources of fines include run-off from arable land, land (especially banks) trampled by livestock, sewage and industrial discharges.	Yes
Water courses of plain to montane levels with <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation Bullhead Spined loach White-clawed crayfish	Habitat functioning: water quality	EA monitoring	Orthophosphate levels: < 0.10mg/litre as an annual mean	Elevated phosphorus levels interfere with competitive interactions between higher plant species and between higher plants and algae, leading to dominance by attached forms of algae, deterioration of vegetative habitat, and declines in abundance and/or diversity of characteristic plant species (which may include lower plants such as mosses and liverworts). The respiration of artificially large growths of benthic or epiphytic algae may generate large diurnal sags in dissolved oxygen in the water column and/or substrate fish and invertebrate species. Excessive benthic algal growth can also enhance the trapping of fine sediments within riverine gravels, enhancing siltation and exacerbating poor substrate conditions. Where modelling has been undertaken, the river should comply with the targets at all points along its length except within effluent mixing zones of acceptable size.	Yes
Water courses of plain to montane levels with <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation	Habitat structure: channel and banks	For bank vegetation: a simplified Phase I habitat survey, carried out at 10 RHS transect locations or as part of the sweep-up survey (see Appendix 6 of the JNCC CSM Guidelines for Rivers, March 2005).	Bank and riparian zone vegetation Bank and riparian zone vegetation structure should be near-natural. For bank vegetation the target is a mean score for the assessment unit of 4 or 5. For riparian zone vegetation the	Note: The protocol in Appendices 6 and 7 of JNCC CSM Guidelines for Rivers, March 2005 used to assess bank and riparian zone naturalness incorporates a modification due to negative indicator species. Spined loach: Extent of submerged and marginal plants: A mosaic of bare substrate and submerged beds of higher plants provides optimal conditions in relation to feeding, cover from predators and spawning (which occurs on submerged plants). Marginal emergents also provide important cover and feeding opportunities. Vegetation	Yes

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
		For the riparian zone: RHS transect data, assessed using the protocol in Appendix 7 of the JNCC CSM Guidelines for Rivers, March 2005 .	target is a mean score for the assessment unit of 4 or 5.	management should be limited to no more than 50% of the channel width (submerged plants) and 50% of bank length (marginal fringe), cut in patches. Most river SSSIs/ ASSIs and SACs do not extend to the entire catchment.	
Bullhead	River morphology	Routine statutory agency consenting process	Woody debris removal should be minimised, and restricted to essential activities such as flood defence	Bullheads are particularly associated with woody debris in lowland reaches, where it is likely that it provides an alternative source of cover from predators and floods. It may also be used as an alternative spawning substrate.	Yes
Bullhead	River morphology	Routine statutory agency consenting process	Weed cutting should be limited to no more than half of the channel width	The importance of submerged higher plants to bullhead survival is unclear, but it is likely that where such vegetation occurs it is used by the species for cover against predators. Weed cutting should be limited to no more than half of the channel width in a pattern of cutting creating a mosaic of bare substrate and beds of submerged plants.	Yes
Bullhead	River morphology	Assess river morphology using RHS and fluvial audit	<p>River habitat SSSI features should be in favourable condition.</p> <p>Maintain the characteristic physical features of the river channel, banks and riparian zone.</p> <ul style="list-style-type: none"> Slack water refuges should be present Patches of high canopy tree cover should be present along channel banks with associated woody debris present within the channel Unsiltd coarse (gravel / pebble / cobble) dominated substrate should be present 	<p>The characteristic channel morphology provides the diversity of water depths, current velocities and substrate types necessary to fulfil the spawning, juvenile and dispersal requirements of the species. The close proximity of different habitats facilitates movement to new preferred habitats with age.</p> <p>Operations that widen, deepen and /or straighten the channel reduce variations in habitat. New operations that would have this impact are not acceptable within the SAC, whilst restoration may be needed in some reaches.</p> <p>Unsiltd coarse (gravel / pebble / cobble) dominated substrate: males guard sticky eggs on the underside of stones. Larger stones on a hard substrate providing clear spaces between the stream bed and the underside of pebbles / cobbles are therefore important.</p> <p>Slack-water refuges provide important refuges against high flow conditions. Suitable refuges include pools, submerged tree root systems and marginal vegetation with >5 cm water depth.</p>	Yes

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
				The relative importance of shade compared with the provision of woody debris is unclear, but the maintenance of intermittent tree cover in conjunction with retention of woody debris ensures that habitat conditions are suitable. <i>In lowland reaches without any riparian trees, it may be desirable to introduce a limited amount of cover.</i>	
White-clawed crayfish	River morphology	Assess river morphology using RHS	<p>Maintain the characteristic physical features of the river channel, banks and riparian zone.</p> <ul style="list-style-type: none"> Engineering works affecting crayfish habitat and refuges must at least replace the pre-works availability of such habitat and refuges. Extent of large woody debris: Woody debris should be retained in-situ unless it poses a flooding or health and safety risk. Vegetation management should be limited to no more than 50% of the channel width (submerged plants) and 50% of bank length (marginal fringe). Extent of overhanging riparian vegetation: this should cover at least 10% of the bank length throughout the year, distributed in patches along the margins 	<p>A natural channel morphology provides a diversity of refuge and feeding opportunities. The proximity of different refuges facilitates foraging and the movement of individuals to different habitats with age.</p> <p>Operations that widen, deepen and/or straighten the channel reduce variations in habitat. New operations that would have this impact are not acceptable within an SAC, whilst restoration may be needed in some reaches.</p> <p>Extent of cobbles/ boulders: where they occur naturally, cobbles and boulders are used extensively by crayfish as refuge. Engineering works can result in the loss of large material – any works should at least replace the pre-works availability of such refuges.</p> <p>Fallen branches and trunks are used extensively by crayfish as refuge. Woody debris is typically removed during maintenance operations, but it is important to retain as much as possible, particularly where other forms of refuge are in short supply.</p> <p>Bankside refuges provide important refuges and are often lost during engineering operations. Any works should at least replace the pre-works availability of refuges.</p> <p>Submerged higher plants provide cover away from the banks, and also represent a valuable food source. Marginal emergents also provide important cover and feeding opportunities.</p> <p>Overhanging trees provide valuable shade and food sources and, in addition, supply woody debris to the river. Submerged tree-root</p>	Yes

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
			<ul style="list-style-type: none"> Extent of bankside tree cover: overhanging trees should cover between 5 – 10% of the bank length, distributed in patches along the margins. provide valuable shade & food sources and, in addition, supply woody debris to the river. Submerged tree-root systems provide important cover & refuges from flood flows. 	systems provide important cover and refuges from flood flows.	
White-clawed crayfish Bullhead	Negative indicators	Crayfish surveys in catchments thought to be at risk	Non-native crayfish should be absent. If present, measures should be taken to control their numbers.	<p>Once non-native crayfish species are established in a water body, native populations are usually eliminated quite rapidly, if not by competition and predation then by crayfish plague. If already present in an SAC, measures should be taken to control the spread of alien species and, if possible, reduce their numbers.</p> <p>Bullhead densities have been found to be negatively correlated with densities of non-native crayfish in the River Great Ouse, suggesting competitive and/or predator-prey interactions.</p>	Yes
Otter	Food availability	EA, local fishery trusts and/or SFCC data	Fish biomass stays within expected natural fluctuations.	Accurate information on fish stocks is difficult to obtain according to a recent review of data from England, produced by the Environment Agency (Research and Development Technical Report TR W256, Otters- Fish Prey Availability, Biomass and Sustainability) and may be extremely difficult to interpret. However, there is an obligation to monitor fish communities under the Water Framework Directive and a more comprehensive monitoring system is being instigated by the Environment Protection Agencies.	Yes
Otter	Toxic chemicals	Monitoring by relevant Environment Protection Agency. Specialist group to meet at intervals to identify national trends	No increase in pollutants potentially toxic to otters.	Liaison between Country Agency Staff and EA/SEPA essential.	Yes

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
		and extract information on individual SACs.			
Otter	Anthropogenic mortality 2 (Discretionary)	Road and rail casualties. Deaths due to fishing gear etc. Any site where there is a feature causing otter mortality. Data from EA's reporting system. Obtain views from EA on implications of recent data. JNCC otter data on the CITES database.	Otter populations not significantly impacted by human induced kills.	Monitoring this attribute, where appropriate should provide data for installing mitigation.	Yes
Otter	Disturbance	Extent of public access to river	No significant change to river or bankside usage. No significant development		Yes
Otter	Bankside cover	Proportion of bank lined with trees, scrub or thick vegetative cover	No overall permanent decrease	Some change acceptable as long as no overall decrease.	Yes
Water courses of plain to montane levels with <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation White-clawed crayfish	Habitat functioning: water flow	Data on gauged and naturalised flows, flow accretion methods, and the Resource Assessment Method (RAM) Framework. Field observations	Flow regime should be characteristic of the river. Levels of abstraction should not exceed the generic thresholds laid down for moderately sensitive SSSI rivers by national guidance: Maximum acceptable % deviations from daily naturalised flows throughout the river: <Qn 50 – 20%	River flow affects a range of habitat factors of critical importance to bullhead and spined loach, including current velocity, water depth, wetted area, substrate quality, dissolved oxygen levels and water temperature. There should be >5 cm water depth over riffles in summer. The maintenance of both flushing flows and baseflows, based on natural hydrological processes, is vital. Detailed investigations of habitat-flow relationships may indicate that a more or less stringent threshold may be appropriate for a specified reach; however, a precautionary approach would need to be taken to the use of less stringent values. As a guideline, at least 90% of the naturalised daily mean flow should remain in the river throughout the year.	Yes

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
Bullhead Spined loach			<p>Qn50 – 95 – 15% >Qn95 – 10-15%</p> <p>Ecological flow criteria already laid down for the river should also be complied with.</p> <p>There should be no obvious problems with water availability within the monitoring unit.</p>	<p>Naturalised flow is defined as the flow in the absence of abstractions and discharges. The generic targets vary according to the specific sensitivity of the reach type, with large lowland rivers having somewhat lower sensitivity than headwater streams. Any relaxation of generic targets on regulated SSSI rivers should relate to the desirability and ecological sustainability of regulating structures.</p> <p>The availability and reliability of data is patchy – long-term gauged data can be used until adequate naturalised data become available, although the impact of abstractions on historical flow records should be considered.</p>	

Audit Trail
Rationale for limiting standards to specified parts of the site
Indicators of local distinctiveness removed from the standards as site-specific aspects are covered by other attributes.
Rationale for site-specific targets (including any variations from generic guidance)
Habitat structure: substrate target taken from EA Conservation Strategy for the River Mease SAC in Liaison EA File.
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

European Site Conservation Objectives for River Mease Special Area of Conservation Site code: UK0030258

With regard to the natural habitats and/or species for which the site has been designated ('the Qualifying Features' listed below);

Avoid the deterioration of the qualifying natural habitats and the habitats of qualifying species, and the significant disturbance of those qualifying species, ensuring the integrity of the site is maintained and the site makes a full contribution to achieving Favourable Conservation Status of each of the qualifying features.

Subject to natural change, to maintain or restore:

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats and habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and habitats of qualifying species rely;
- The populations of qualifying species;
- The distribution of qualifying species within the site.

Qualifying Features:

H3260. Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation; Rivers with floating vegetation often dominated by water-crowfoot

S1092. *Austropotamobius pallipes*; White-clawed (or Atlantic stream) crayfish

S1149. *Cobitis taenia*; Spined loach

S1163. *Cottus gobio*; Bullhead

S1355. *Lutra lutra*; Otter

Explanatory Notes: European Site Conservation Objectives

European Site Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2010 (the “Habitats Regulations”) and Article 6(3) of the Habitats Directive 1992. They are for use when either the appropriate nature conservation body or competent authority is required to make an Appropriate Assessment under the relevant parts of the respective legislation.

These conservation objectives are set for each habitat or species of a [Special Area of Conservation \(SAC\)](#). Where the objectives are met, the site can be said to demonstrate a high degree of integrity and the site itself makes a full contribution to achieving favourable conservation status for those features.

This document is also intended for those who are preparing information to be used for an appropriate assessment by either the appropriate nature conservation body or a competent authority. As such this document cannot be definitive in how the impacts of a project can be determined. Links to selected sources of information, data and guidance which may be helpful can be found on Natural England’s website. This list is far from exhaustive.