

Definitions of Favourable Condition for designated features of interest



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

Name of Site of Special Scientific Interest (SSSI)	
River Lugg	
Names of designated international sites	
Special Area of Conservation (SAC)	River Wye (Lower Wye) / Afon Gwy (Gwy Isaf) Candidate Special Area for Conservation (cSAC; SDdGA)
Special Protection Area (SPA)	
Ramsar	
Relationship between site designations	
Only the lowest unit up to Hampton Court Bridge is SAC. The reason the SAC stops here is because the weir originally stopped Salmonoid fish, and this is the reason for inclusion of SAC length. All water in this unit is SSSI and SAC. The other 3 units are just SSSI. Paper maps define the distance from bank top that is designated and therefore what adjacent habitats are included in the notification. These conservation objectives have been produced to assess the interest features of only the English sections of the River Lugg.	

Version control information	
Version	Consultation Draft
Prepared by	Daisy Burris
Date of this version	26 th September 2022
Date of generic guidance on favourable condition used	CSM Guidance for Rivers – September 2016 CSM Guidance for Freshwater Fauna - October 2015 CSM Guidance for Invertebrates – March 2008 CSM Guidance for Mammals (Terrestrial) - 2004
Other notes/version history	Original version David Heaver 27th Oct 2006. Amended March 2009 by Elisabeth Dack. Amended March 2011 by Helen Wake and Graham Walker

This Monitoring Specification uses the list of notified features previously published on Designated Sites Viewer which predates Natural England's 2023 review of SSSI Citations. Whilst Designated Sites Viewer was updated in May 2023 to reflect the confirmed list of notified features resulting from that review, further work is required to update this Monitoring Specification. Although not all the features listed in this Monitoring Specification are now considered notified features in their own right, they all remain as components of the notified features and hence still form part of the methodology for assessing condition of the notified features.

Definitions of Favourable Condition: notes for users

Definitions of Favourable Condition

The definitions comprise one or more condition definitions for the special interest features at this site. These are subject to periodic review and may be updated to reflect new information or knowledge. They will be used by Natural England to determine if a site is in a favourable condition. The standards for favourable condition have been developed and are applied throughout the UK.

Standards for favourable condition are defined with reference to the specific designated features listed in Table 1 and are based on a selected set of attributes for features which most effectively define favourable condition as set out in Tables 2, 2a and 3. When an SSSI's features meet these attributes, then they are said to be in 'favourable condition'.

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 have been tailored by local staff to reflect the 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.

Use under the Habitats Regulations

The Definitions of Favourable Condition (DFCs) are used to periodically measure and assess the condition of both notified SSSI features and designated European Site features.

Where SSSIs also form part of a European Site (such as a SAC or SPA), a separate document containing specific European Site Conservation Objectives will have been prepared. These objectives are those referred to in the Conservation of Habitats and Species Regulations 2017 (as amended) (the Habitats Regulations). They are for use when either the appropriate nature conservation body or a competent authority is required to make an 'appropriate assessment' of the likely effects of a proposed plan or project on the integrity of a European Site under the relevant parts of the respective legislation. The European Site Conservation Objectives are available from the [Natural England Publications Catalogue](#).

The concepts of 'site integrity' and 'favourable condition' are similar, and the assessment of a feature's condition will measure attributes that also represent aspects of a site's ecological integrity. However, the periodic determination of a feature's condition is separate from a judgement about the effect upon a site's overall integrity. This is because the DFCs do not represent a comprehensive or definitive list of all the elements that might contribute to site integrity, merely those that are most appropriate to monitor in order to rapidly determine the present condition of a feature. The full range of factors that are components of a site's integrity, and which may need to be considered by an appropriate assessment, will be specified in the European Site Conservation Objectives. Some of the information contained within the DFCs may however contribute to such assessments.

Table 1 Designated Interest Features

Broad Habitat type / Geological Site Type	Designated features	Description of the feature for clarification	SSSI notified interest features	SAC qualifying interest features	SPA qualifying interest features dependency on specific habitats			Ramsar criteria applicable to specific habitats			
					Annex 1 species	Migratory species	Waterfowl assemblage	1. Representative, rare, or unique example of a natural or near-natural wetland type	2. Vulnerable, endangered, or critically endangered species or threatened ecological communities	5. Regularly supports 20,000 or more waterbirds	6. Regularly supports 1% of the individuals in a population of one species / subspecies of waterbirds
Rivers	Running water G2, River Type: Type II (Group A2ii) Type VI (Group B3i) (Group B4i) Type VIII (Group Ciii).	Slow flowing, naturally eutrophic lowland rivers, dominated by clays Lowland base-rich, mesotrophic rivers in western and northern Britain, with a moderate to fast current. Oligo-mesotrophic rivers, predominantly upland over hard rocks. (In Wales	✱								

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Broad Habitat type / Geological Site Type	Designated features	Description of the feature for clarification	SSSI notified interest	SAC qualifyi	SPA qualifying interest features dependency on specific habitats			Ramsar criteria applicable to specific habitats			
		only)									
Rivers	H3260 Water courses of plain to montane levels with Ranunculon fluitantis and Callitricho-Batrachion vegetation	This is the description for the European interest feature, whilst the above are the SSSI interest features. For site assessment purposes, however, the favourable condition attributes are the same.		*							
Rivers	Fish Lampetra fluviatilis Petromyzon marinus Lampetra planeri Alosa alosa Alosa fallax Salmar salmo Cottus gobio	River lamprey Sea lamprey Brook lamprey Allis Shad Twaite shad Atlantic salmon Bullhead		*							
Rivers	Invertebrate assemblage W1 flowing water		*	*							

Broad Habitat type / Geological Site Type	Designated features	Description of the feature for clarification	SSSI notified interest	SAC qualify	SPA qualifying interest features dependency on specific habitats			Ramsar criteria applicable to specific habitats			
Rivers	Austropotamobius pallipes	White-clawed Crayfish	*	*							
Rivers	Mammals Lutra	Otter Populations	*	*							

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.

Audit Trail
Rationale for interpretation of the citation including any other information you have used, and advice received from Designations Team/Specialists (any supporting information should be stored in the site file on RM8).
Unit 1 (from the confluence of the Wye to up to Hampton Court Bridge) is the only SAC unit. All features noted above as SAC features therefore only link to unit 1. However, all species and habitats above are present in SSSI and SAC (See Annex 2).
Other Notes (Include here any features of local distinctiveness)

Table 1A Location of Reportable Features

The reportable features allocated in this table will determine the features allocated to each unit in CMSi and the features you report condition on following a condition assessment.  [This new tool](#) will help you to identify reportable features. It joins together the notified and reportable feature lists. For each notified feature it will tell you what options you have for reportable features based on the Common Standards Monitoring (CSM) guidance used to write the FCT. **Please read the notes page in the spreadsheet before you use it.**

FEATURES ON UNITS:

[View reportable features on units](#)

You may find it easiest to cut and paste in the reportable feature table displayed in [DS Views](#) and then amend it so that you can identify the changes that need to be made to CMSi at the same time.

Reportable Feature	Designation (SSSI/SAC/SPA)	Unit No			
		1	2	3	4
Rivers and streams	SSSI	*	*	*	*
River supporting habitat	SSSI	*	*	*	*
H3260 Water courses of plain to montane levels with Ranunculus fluitans and Callitriche-Batrachium vegetation	SAC	*			
River Lamprey	SAC	*			
Sea Lamprey	SAC	*			
Brook Lamprey	SAC	*			
Allis Shad	SAC	*			
Twaite Shad	SAC	*			

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Atlantic Salmon	SAC	*			
Bullhead	SAC	*			
Invertebrate assemblage W1 flowing water	SSSI/SAC	*	*	*	*
White Clawed Crayfish	SSSI/SAC	*	*	*	*
Otter	SSSI/SAC	*	*	*	*

Audit Trail
Rationale for habitat extent attribute (Include methods of estimation (measures), and the approximate degree of change which these are capable of detecting). The fish are a SAC only feature and therefore they only need to be assessed for Unit 1. Confirmation of data sources required through consultation with EA. Species extent recorded against particular units through knowledge of previous surveys and local data. Revised base line survey required to be able to update this information.
Rationale for site-specific targets (including any variations from generic guidance)
Other Notes

Table 2 Habitat Extent Objectives

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 there has been a reduction in extent from the baselines specified below.

Habitat Feature	Estimated extent (ha) and date of data source/estimate	Site Specific Target range and Measures	Comments
River Types	SSSI area which includes adjacent designated terrestrial habitats = 210 ha Total SSSI area = 236.95ha English length of river = 74.15km	Type II recorded from Bodenham to Confluence Unit 1 SAC and Unit 3 Type VI – Unit 2 and 4 See Annex II Table A for unit Ha size.	

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 source from original citation. Tributary impacts – Although not designated in their own right the influence of the water quality and flow of the many tributaries has a high impact on the condition of the main river SSSI. Many different species are recorded in the SSSI and SAC designation documentation but for the purposes of a Condition Assessments of the river units it is the fact that a whole selection of the terrestrial and river habitats form part of the designation description not just the species present. Author who penned the first conservation strategy and who notified the Lugg clearly noted that the wet woodlands along the Lugg, though important, were not to be considered as SSSI features in their own right but important site fabric. This is the position maintained here. SSSI Units follow the principal river types and are taken to the main bridges or fixed features as described in the unit names (refer to Annex 2).
Rationale for site-specific targets (including any variations from generic guidance)
Other Notes

Table 2a Species Population Objectives

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 there has been a reduction in size of population or assemblage.

Species Feature (species or assemblage)	List supporting Broad Habitats	Population Attribute (e.g., presence/absence, population size or assemblage score)	Site Specific Target range and Measures (specify geographical range over which target applies i.e., site, broad habitat or more specific)	Comments
Fish Atlantic salmon Allis Shad Twaite shad River lamprey Sea lamprey Brook lamprey Bullhead	Rivers and streams	Spatial extent	Atlantic Salmon: Juvenile Atlantic salmon should be present in all areas of the catchment to which they have natural access. Shad: Shad should be present in naturally suitable habitat in all units. Kick sampling-Distribution indicated by presence of shad eggs reflecting near natural conditions. Lamprey: <i>Petromyzon marinus</i> (Sea lamprey): distribution should reflect that anticipated under near-natural conditions Lampetra sp: i) distribution should reflect that anticipated under near-natural conditions ii) As a minimum, Lampetra should be present in not less than 50% of all sampling sites surveyed with suitable habitat present	Atlantic Salmon: Does not include areas above naturally impassable barriers. Areas where access has been limited by artificial obstructions should be identified. Shad: Historic records and expert judgement (where barriers to migration have since been removed) should be used to select monitoring sites. Genetic analysis of a sub-set of collected shad eggs should be conducted. CSM guidance to be followed. Absence of shad and shad eggs (if survey effort allows) in suitable spawning reaches throughout the wider catchment due to factors such as barriers should be noted.

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			within the natural range. iii) Where Lampetra have been found in the past they should be present in 90% of sampling sites if suitable habitat remains. Bullhead: Should be present in naturally suitable habitat throughout the designated site	Monthly mean and minimum flow data from in river gauges should be assessed for May to June (and possible into July if evidence of late spawning) from the Environment Agency or Natural Resource Wales. An assessment should be made as to whether the flow conditions could affect the spawning distribution due to impassability of barriers. Where discharges are made from reservoirs to the Rivers between April – July and are considered to cause potential issues for migration (e.g., due to lower river temperatures) an assessment should be conducted including records of discharge amounts and frequency. General habitat utilisation may also be evidenced though other means including seine netting, electrofishing, fish counters, hydroacoustic counters, video equipment, reliable visual observation, and presence of

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				spent carcasses. Lamprey: Larval lamprey should be sampled using targeted electrofishing surveys in accordance with JNCC (2015) guidelines. Surveys would be best timed to overlap with the metamorphosis of larval lamprey (July-September) to aid in species identification. Bullhead: Routinely collected EA/NRW survey data available to determine distribution on 'primary watercourses.
Fish River lamprey Sea lamprey Brook lamprey Allis Shad Twaite shad Atlantic salmon	Rivers and streams	Population density: Juveniles	Atlantic Salmon: Population density should not differ significantly from that expected for the river type/reach under conditions of high physical and chemical quality. Shad: Juvenile populations density should not	Atlantic Salmon: Determine using quantitative, semi quantitative, and timed electrofishing data as appropriate. The EA FCS2 tool may aid in determining expected population densities.

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Bullhead			differ significantly from those expected under near natural conditions and should be determined via seine netting (in the lower river between July and October). Lamprey (larval density): Overall assessment unit: should have a mean of >5 lamprey per m2 of suitable habitat.	Should also consider the population age structure. Comprehensive guidance on determining favourable condition in relation to adult and juvenile Salmon population parameters can be obtained in *Cowx, 2002. Lamprey: Determine using targeted electrofishing. As their larvae are generally found in low numbers in habitat in water of wadable depth, this target does not apply to <i>Petromyzon</i>.
Fish River lamprey Sea lamprey Brook lamprey Allis Shad Twaite shad Atlantic salmon Bullhead	Rivers and streams	Population density: adult run size	Atlantic Salmon: Total run size at least matching an agreed reference level, including a seasonal pattern of migration characteristic of the river and maintenance of the multi-sea- winter component. Shad: Adult run size: should reflect natural	Shad: Where technological limitations prevent an accurate record of individual numbers of shad utilising/migrating through a river system, the number of shoals should be noted instead. Lamprey: Due to river and sea lamprey not

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			conditions. Fish counters, hydroacoustic counters and video equipment should be used to determine this. Lamprey: Annual run size of Petromyzon and Lampetra fluviatilis should reflect that expected under near-natural conditions. Methods of assessment for determining Run size include the following: DIDSON Direct observation of spawning sites Trapping using fyke nets or specifically designed traps	expressing complete fidelity to their natal river, monitoring should be carried out over several years to determine the degree of natural variation in annual run size before an assessment of compliance is undertaken. A combination of direct observation of spawning sites, trapping, use of DIDSON technology, or review of CPUE data for catch returns may help in these assessments.
Bullhead	Rivers and streams	Population density: Adult	There should be no reduction in densities from known levels for individual survey stretches. In any case, there should be no less than 0.5 per m ² in lowland sections (source altitude greater than or equal to 100m), and no less than 0.2 per m ² in upland areas (source altitude >100m) of the protected site. These values also	May be more difficult to determine using EA survey data where bullhead were not the target species due to effort allocated to seeking out bullhead specifically and this species often being assigned to an abundance category rather than

Species Feature (species or assemblage)	List supporting Broad Habitats	Population Attribute (e.g., presence/absence, population size or assemblage score)	Site Specific Target range and Measures (specify geographical range over which target applies i.e., site, broad habitat or more specific)	Comments
			apply to non-notified tributaries where longevity of bullhead populations is deemed necessary for the resilience of populations located within the protected site itself.	counted.
Bullhead	Rivers and streams	Recruitment	Evidence of recent recruitment in all assessment units.	Bullhead reproduction success can be recorded by a Length-Frequency Analysis of young of year fish. A ratio of 3 or 4 Young of Year fish to 1 Adult should be recorded in units 5, 6 and 7.
Atlantic salmon	Rivers and streams	Population stock size: site conservation limit (CL)	At a minimum the Lugg should meet or exceed its CL in at least four years out of five. To meet this objective the average level of stock typically needs to be 40% above the CL. The CL is set as an egg deposition target. The Conservation Limit for the Lugg (part of the Wye catchment) is - 38.57×10^6.	The CL for each river is set at a stock size. Below this limit further reductions in spawner numbers are likely to result in significant reductions in the number of juvenile fish produced in the next generation. The Management Target for the Lugg(as part of the Wye catchment) is - 49.31×10^6. The Wye has not achieved its MT in the last fifteen years and likely has not done so since 1997. The egg deposition target may not be adequately precautionary

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				as it is based on the available spawning habitat and the assumption that everything is pristine and optimum. This may not consider adequately pollution, siltation, acid rain, FEB pressure, etc, and therefore may require revision if evidence indicates that the target is not sufficiently precautionary and is set too low.
Fish River lamprey Sea lamprey Brook lamprey	Rivers and streams	Age structure (Lampetra sp. only)	There should be evidence of recent recruitment in each assessment unit.	Age structure (Lampetra sp. only)
Fish River lamprey Sea lamprey Brook lamprey Allis Shad Twaite shad Atlantic salmon Bullhead	Rivers and streams	Stocking/transfers Stocking/transfers of other species	There should be no stocking unless agreed to be in the best interests of the population. Where stocking of other species is permitted, this should be limited to densities unlikely to cause predation pressure and competitive interactions.	
Fish	Rivers and	No non-native	Various sources including ad hoc	Refer to the WFD list of

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River lamprey Sea lamprey Brook lamprey Allis Shad Twaite shad Atlantic salmon Bullhead	streams	species likely to cause impairment of populations	observations, specific site investigations and data collected by the environment agencies.	alien/locally absent species (but not to be used exclusively)
White Clawed Crayfish <i>Austropotamobius pallipes</i>	Rivers - High water quality	Presence/absence	Units 1-4. Individuals present with no sign of crayfish plague. 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. Decline in presence of Bullhead often associated with presence of Signal Crayfish Populations are highly susceptible to the additional stress of abstraction during the summer dry period. No reduction in wetted area should be permitted, which especially effects backwaters and shallow pools.	Crayfish survey undertaken by Hills ecology in 2013 confirmed the presence of white-clawed crayfish in units 1,3 and 4 with low to moderate sized populations. No crayfish were present in unit 2. Refer to the Life in UK Rivers standard survey and monitoring protocol for white clawed crayfish

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White Clawed Crayfish <i>Austropotamobius pallipes</i>	Rivers and streams	Alien/locally non-native species	Routine assessments and ad hoc investigations: Non-native crayfish should be absent. A decline in the presence of Bullhead and a reduction in lotic macro-invertebrate diversity may be associated with Signal Crayfish presence.	Crayfish survey undertaken by Hills ecology in 2013 recorded low to very high populations of signal crayfish were recorded in units 1 and 2, and low population abundance in unit 4.
White Clawed Crayfish <i>Austropotamobius pallipes</i>	Rivers and streams	Population abundance	Shallow water: Hand searching- a mean of at least 5 out of 100 refuges containing white-clawed crayfish within a unit of assessment Deep water: Trapping. At least 1 individual caught per trap on average	Site specific targets are not included. Generic guidance should be followed unless site-specific evidence suggests lower or higher WCC densities occur naturally. Crayfish densities may be lower than this on some units/rivers due to natural factors and it would be wrong to assume such lower densities necessarily constitute unfavourable condition. Determination of unfavourable condition should only be made where low densities are known to be related to an impact of some kind, or where historical

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				survey data suggest that higher densities should be present. Regular monitoring on different river types using the standard protocol will provide data on which targets can be produced in the future. Where higher WCC densities are found and this is not due to unnatural causes (for example presence of artificial refugia such as gabion blocks in channel as a result banks/structure reinforcements), a higher target may be set to prevent deterioration. Populations are highly susceptible to the additional stress of abstraction during the summer dry period. No reduction in wetted area should be permitted, which especially effects backwaters and shallow pools.
White Clawed Crayfish	Rivers and streams	Population structure	Hand searching- At least 20% of the population should be <25mm carapace	

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<i>Austropotamobius pallipes</i>			length (CL), as evidence of recruitment. Approximately equal numbers of sexes in the adult population.	
S1092 White-clawed (or Atlantic stream) crayfish <i>Austropotamobius pallipes</i>	Rivers and streams	Population health	Absence of Crayfish plague (<i>Aphanomyces astaci</i>) in the population 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	Crayfish plague can be introduced by the entry of non-native crayfish species into a site, but also through contaminated equipment (nets, boots, etc.) and stocked fish from infected waters.
Otter <i>Lutra lutra</i>	Rivers and streams	Spatial extent and density	Presence recorded throughout all units of the SSSI and the wider functionally linked catchment. Population size at least maintained or increasing. Presence of enough suitable habitat. No reduced habitat availability. Fish biomass stays within natural fluctuations recorded through EA, Local fishery etc. No reduced food availability. No increase in anthropogenic factors damaging to otter populations – monitored through the EA (i.e., reduction	Local records centres, Universities, and organisations such as the Environment Agency and Natural Resources Wales can provide data useful in reviewing species condition. For example, otter habitat and prey availability information are available through River Habitat Survey and fish survey data collected by the EA and NRW, whereas data on bioaccumulation of toxins in otters is available from Cardiff University.

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			in water availability, increase in toxins entering the water environment, fatalities due to road incidents etc.). Human influence limited, shown by less road/rail kill, no fisheries impact. Recording through EA and using JNCC data on CITES database. Bankside vegetation retained – assess through adjacent habitats and vegetation composition Population size and distribution should be determined using a mix of: • Regular walkover surveys (once every 5-6 years will suffice once good quality data is available on distribution and abundance, check LRR SAC monitoring scheme data) • Use of eDNA data • Reports of direct sightings, presence of signs (spraint, hairs etc.), presence of holts. • Data gathered on otter fatalities and likely causes	
Invertebrate	Rivers and	Needs completing		

Species Feature (species or assemblage)	List supporting Broad Habitats	Population Attribute (e.g., presence/absence, population size or assemblage score)	Site Specific Target range and Measures (specify geographical range over which target applies i.e., site, broad habitat or more specific)	Comments
assemblage W1 flowing water	Streams			

Audit Trail
Rationale for species population attributes (Include methods of estimation (measures), and the approximate degree of change which these are capable of detecting). Hills Ecology (2013) Crayfish Survey - http://trim/HPEContentManager/?uri=7834111&t=record&lang=ln_english&mbd=false Site specific targets based on baseline populations; extent & assemblage scores need to be included – current document in consultation format. Published available baseline data requires reviewing. Species population objectives will be subject to evaluation and review when resourcing allows and / or when additional survey data becomes available.
Rationale for site-specific targets (including any variations from generic guidance)
Other Notes

Table 3 Site Specific Habitat/Geological Condition Objectives *[insert a separate Table 3 for each broad habitat]*

To maintain the freshwater and species of the River Lugg SSSI/SAC in favourable condition. Favourable condition is defined in terms of the following site-specific standards.

Details of any geographical variation or limitations to where the favourable condition standards apply.

Interest Feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA?
Rivers and streams	Habitat functioning Water Quality (General assessments)	EA standard monitoring protocols Use AMP/ CAMS information and CSF data	Biological and Chemical General Quality Assessment Class All Units: High ecological status for WFD reportable physico-chemical quality elements. Dissolved oxygen – 85% saturation (10 percentile); BOD – 1.5mg/l (90 percentile); Ammonia – 0.25mgN/l (90 percentile). Un-ionised ammonia <0.021 µg L-1 as a 95-percentile All Units - No drop in class from existing situation.	The un-ionised form of ammonia is highly toxic to freshwater fauna. This target is the same as the EQS used by the EA. Unit 1 – particularly important to be low because of Rannunculus beds	Yes
Rivers and streams	Habitat functioning Water Quality	EA standard monitoring	Soluble Reactive Phosphorus	Elevated phosphorus levels interfere with competitive interactions between	Yes

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Interest Feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA?																																								
		protocols	<table><thead><tr><th>Site ID</th><th>Unit</th><th>Site Name</th><th>OP Target (µg/L)</th><th>Comments</th></tr></thead><tbody><tr><td>RSN1975</td><td>4</td><td>RSN1975 LUGG, DS HINDWELL BROOK</td><td>15?</td><td>No assessment has been undertaken for this unit</td></tr><tr><td>50039</td><td>3</td><td>R LUGG AT MORTIMERS CROSS BRIDGE</td><td>15</td><td></td></tr><tr><td>50042</td><td>2</td><td>R LUGG AT EATON BRDGE, LEOMINSTER</td><td>30</td><td>More accurate application of CSMG standards using higher resolution site characteristics data.</td></tr><tr><td>50043</td><td>2</td><td>R LUGG AT FORD BRIDGE</td><td>30</td><td></td></tr><tr><td>RSN1762</td><td>1</td><td>LUGG, DS MORETON ON LUGG</td><td>30</td><td>This is a new site.</td></tr><tr><td>50047</td><td>1</td><td>R LUGG AT WERGINS BRIDGE</td><td>30</td><td></td></tr><tr><td>50050</td><td>1</td><td>R LUGG AT MORDIFORD BRIDGE</td><td>30</td><td></td></tr></tbody></table>	Site ID	Unit	Site Name	OP Target (µg/L)	Comments	RSN1975	4	RSN1975 LUGG, DS HINDWELL BROOK	15?	No assessment has been undertaken for this unit	50039	3	R LUGG AT MORTIMERS CROSS BRIDGE	15		50042	2	R LUGG AT EATON BRDGE, LEOMINSTER	30	More accurate application of CSMG standards using higher resolution site characteristics data.	50043	2	R LUGG AT FORD BRIDGE	30		RSN1762	1	LUGG, DS MORETON ON LUGG	30	This is a new site.	50047	1	R LUGG AT WERGINS BRIDGE	30		50050	1	R LUGG AT MORDIFORD BRIDGE	30		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 river 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.	
Site ID	Unit	Site Name	OP Target (µg/L)	Comments																																									
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Rivers and streams	Habitat functioning Water Quality	EA monitoring A Fluvial Audit of the catchment may help define sources of sediment	Suspended solids No unnaturally high loads. All units – less than 10mg/l White Clawed Crayfish require low levels of suspended sediments in all units, or their respiratory system fails	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.	Yes																																								

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				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. Whilst the EC Freshwater Fish Directive target for SS is 25 mg/l (annual mean), a target of no more than 10mg/l is suitable for most river reaches.	
Rivers and streams	Habitat functioning Water flow	Data on gauged and naturalised flows Flow accretion methods Resource Assessment Method (RAM) Framework	Flow regime should be characteristic of the river & the natural flow regime of the river should be protected. Levels of abstraction should not exceed those laid down in relation to daily naturalised flows. Daily flows should be close to what would be expected in the absence of abstractions and discharges (the naturalised flow). There should be no obvious problems with water availability within the assessment	River flow affects a range of habitat factors of critical importance to characteristic flora and fauna, including current velocity, water depth, wetted area, substrate quality, dissolved oxygen levels and water temperature. The maintenance of both flushing flows and seasonal base flows, based on natural hydrological processes, is vital.	Yes

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		Field observations	unit. Springs in aquifer-fed sections of river should be maintained Ecological flow criteria already laid down for the river should also be complied with (e.g., for the passage of Salmon). Maximum (%) reduction from daily naturalised flow targets for the River Lugg in England are as follows: Unit 1 – High Unit 2 – Moderate Unit 3 & 4 – Very High <table><tr><td rowspan="2">Environmental Weighting band (sensitivity)</td><td colspan="3">Maximum % reduction from daily naturalised flow</td></tr><tr><td><Qn50</td><td>Qn50-95</td><td>>Q95 (low flows)</td></tr><tr><td>Moderate</td><td>20</td><td>15</td><td>10-15</td></tr><tr><td>High</td><td>15</td><td>10</td><td>5-10</td></tr><tr><td>Very High</td><td>10</td><td>10</td><td>1-5</td></tr></table>	Environmental Weighting band (sensitivity)	Maximum % reduction from daily naturalised flow			<Qn50	Qn50-95	>Q95 (low flows)	Moderate	20	15	10-15	High	15	10	5-10	Very High	10	10	1-5	Naturalised flow is defined as the flow in the absence of abstractions and discharges. Any relaxation of generic targets on regulated SSSI rivers should relate to the desirability and ecological sustainability of regulating structures. 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. Headwater sections are particularly vulnerable to abstraction, and downstream migration of perennial heads, other than in drought conditions, is a sign of unfavourable condition. Deviations from generic targets are permitted, if robust local hydro-ecological data are available that indicate a different target would be appropriate to protect characteristic communities	
Environmental Weighting band (sensitivity)	Maximum % reduction from daily naturalised flow																							
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				of the river habitat.	
Rivers and streams	Habitat structure Substrate	Field observations Fluvial Audit of catchment should be considered	Siltation No excessive siltation (bed laden sediments). Channels should contain characteristic levels of fine sediment for the river type. Elevated levels of fines (particles <0.83 mm) can interfere with egg survival which is a particular issue in unit 1 and 2 (Lamprey spp). All units – <20% in top 10 cms of mid-channel gravels Level set for all units is driven by presence of Rannunculus Larger stones on a hard substrate providing clear spaces between the stream bed and the underside of pebbles / cobbles are important for Bullhead. Elevated levels of fines can interfere with egg and fry survival. Units 3 and 4. Salmon require clean gravels in Unit 1.	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. However, widespread siltation of riverine sediments, caused by high particulate loads / reduced scour within the channel (due to artificial channel modifications) is a major threat. 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	Yes

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				plant seeds and fragments from lodging in the substrate and taking root. For river types characterised by extensive Ranunculus beds, there should be a predominance of 'clean' gravels, pebbles, and cobbles, with relatively low cover by silt-dominated substrates. Maximum fines content should not be too great to prevent establishment of new plants. Fines are defined as particles <0.83mm. 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 is already believed to be in decline. Fluvial audit is not a monitoring tool but can deliver an understanding of geomorphological problems unattainable by any other method	

Interest Feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA?
				and help to discriminate between problems of sediment delivery and problems of channel structure. The river should support all 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 re-profiling. The unobstructed main channel is a key feature supporting the Twaite Shad. 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. The new version of Habitat Modification Score (HMS) enables	

Interest Feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA?
				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 semi-natural HMS class 1, with the remainder predominantly unmodified (class 2). Physical targets will need to be adjusted to be compatible with river restoration plans . This includes an analysis of unmodifiable physical constraints to restoration, relating to essential flood protection to people and the built environment).	
Rivers and streams	Diatoms	EA monitoring	The target using the Trophic Diatom Index Ecological Quality Ratio should be a normalised EQR of ≥ 0.8, equivalent to high ecological status (WFD-UKTAG, 2014a). This target should be used as an adjunct to nutrient targets outlined above.	Any sample failing to comply with the relevant biological target within the 3-year period at any sampling site in the assessment unit should be regarded as non-compliant.	Yes

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Rivers and streams	Plant community Species composition and abundance	EA monitoring	LEAFPACS tool should give a result of high ecological status for the assessment unit.	In-channel vegetation of SSSI/SAC rivers should be dominated by characteristic species. LEAFPACS method, with 3-5 sections per assessment unit surveyed depending on its size. More variable assessment units may require more surveys.	Yes
Rivers and streams	Plant community Reproduction	Field observations during macrophyte survey.	A sufficient proportion of all aquatic macrophytes should be allowed to reproduce in suitable habitat, unaffected by river management practices which may be carried Plant reproduction must be present in all Units but more dominant in units 3 and 4.	Flowering outside the normal period and weed cutting or other activities that do not leave patches of plants to flower and set seed are indicators of unfavourable condition.	Yes
Rivers and streams	General macroinvertebrate assemblages	EA invertebrate monitoring data: Overall RICT	WHPT tool should give a result of high ecological status for the assessment unit (NTAXA and ASPT outputs) when comparing observed: expected invertebrate data using the River	EA colleagues are better placed to analyse and report RICT outputs for routine EA invertebrate monitoring sites, therefore liaison is essential.	Yes

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		WHPT NTAXA, ASPT, and PSI scores. Individual species presence/absence data May also conduct assemblage specific surveys	invertebrate classification tool (RICT). PSI (Proportion of Sediment-sensitive Invertebrates) should be formally adopted under the WFD, the target for the assessment unit should be high ecological status. Until formally adopted, the mean EQI for the assessment unit should be 0.9 or more.	Key macro-invertebrate taxa to consider are listed below. These have been selected due to their scarcity, sensitivity and as flag-ships for key habitats, such as submerged wood. Taxa are as follows: • Normandia nitens, • Macronychus quadrituberculatus • Potamanthus luteus, • Setodes punctatus, • Gomphus vulgatissimus, • Platycnemis pennipes Pearl mussel, the most intolerant, is effectively extinct in the main stem and has not been adopted. LIFE scores (Lotic invertebrate flow evaluation) may also be useful to review when determining whether flows are impacting on invertebrate communities as a whole, however this is dependent on whether WQ or other factors impact result interpretation.	

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Rivers and streams	Habitat structure Channel and banks	Assess river morphology using RHS In addition, for planform use map data, aerial survey data, historical records and local knowledge.	Channel planform Channel form should be generally characteristic of river type, with predominantly unmodified planform and profile. ≤ 5% of the assessment unit should be artificial, re-aligned or constrained. For planform the target is a score for the assessment unit of at least 3. For naturalness of the profile using transect data the target is a score for the assessment unit of 4 or 5 (see Appendix 6 of the monitoring protocol). No RHS site to have any of the eight categories of bank profile modification (Section I in RHS 2003 form) recorded as 'extensive'. Area of Lamprey nursery habitat should be present in Unit 1 and 2: Defined as open-structured, aerated, silty and sandy substrates, between 2 and 40cm depth, typically overlain by less than 0.5 m of water. Slack-water channel margins are particularly important, whilst silt accumulations behind weirs can also be valuable in impounded	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 re-profiling. The unobstructed main channel is a key feature supporting the Twaite Shad. 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. 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 semi-natural HMS class 1, with the remainder predominantly	Rivers and streams

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			sections. Presence of dead wood in river in all units is vital. Bullhead has particular associations. Operations that widen, deepen and/or straighten the channel reduce variations in habitat. New operations that would have this impact are not acceptable, whilst restoration may be needed in some reaches. Frequent 2m deep pools are essential in Unit 1 for Salmon and Shad	unmodified (class 2). Physical targets will need to be adjusted to be compatible with river restoration plans . This includes an analysis of unmodifiable physical constraints to restoration, relating to essential flood protection to people and the built environment).	
Rivers and streams	Habitat structure Channel and banks	Bank vegetation Phase I habitat survey, carried out at 10 RHS transect locations. Riparian zone RHS transect data	Bank and riparian zone vegetation Bank and riparian zone vegetation structure should be near-natural. For bank vegetation the target is a mean SERCON score for the assessment unit of 4 or 5. For riparian zone vegetation the target is a mean score for the assessment unit of 4 or 5. All units have vegetation supporting breeding Otter. Bank side tree cover is vital to many notified species. It provides micro-gradients in temperature giving more flexibility for fish habitat provision.	The monitoring protocol is used to assess bank and riparian zone naturalness and incorporates a modification due to negative indicator species. Alien and introduced species must therefore be assessed as part of this methodology. Targets may need to be adjusted to account for unmodifiable problems with vegetation.	Yes

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			The habitat is in hydrological continuity with the river (where appropriate). It supports semi-natural vegetation. Management of the linked habitat does not contribute to the unfavourable condition of the River Units Emergent vegetation is vital in units 1 and 2 in maintaining condition and presence of Lamprey spawning ground.		
Rivers and streams	Habitat structure Channel and banks	River Habitat Survey Data. At least 5 RHS sites should be examined for this target – if fewer than 5 sites are available, assessment units should be amalgamated.	Large Woody Debris Within each assessment unit: EITHER 75% or more RHS sites have large woody debris 'Present' OR 10% or more of RHS sites have large woody debris 'Extensive'	Dead woody material that falls into streams ('woody debris') plays an important role in increasing habitat diversity, providing shelter for fish, supplying a food source for aquatic invertebrates, and for slowing the passage of nutrients downstream. Large woody debris, as defined in RHS as, 'whole trees or large trunks and branches swept downstream and lodged in the channel or on the banks', is a key feature of healthy rivers. As indicated in the River Habitat Survey form (Section J – 'Extent of trees and associated features'), the term 'present' refers to woody debris abundance >0-33% of bank length and the term 'extensive',	Yes

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				woody debris abundance >33% of bank length.	
Rivers and streams	Habitat structure Channel and banks	Use expert judgement.	In-channel structures Throughout the assessment unit: if present, structures should have no effect (or minor effect) on migration, on sediment transport, and habitat structure. Assessments should include the upstream 'ponding' effects that artificial structures have on flow patterns and habitat structure. No artificial barriers significantly impairing characteristic migratory species from essential life-cycle movements. Salmon - No artificial barriers significantly preventing adults from reaching existing and historical spawning grounds, and smolts from reaching the sea. Unit 1 but unit 2 and 3 also important Lamprey spp - No artificial barriers significantly impairing adults from reaching existing and historical spawning grounds. Units 1 and 2 most important. Only Brook Lamprey are likely to be able to pass some barriers	Artificial in-channel structures such as weirs, dams, sluices, fords, groynes and culverts may constitute barriers to the free movement of water, sediment and aquatic organisms, and may affect river-bed structure and hydrology downstream. Although structure impacts are wider ranging than fish migration alone, artificial barriers are probably the single most important factor in the decline of shad in Europe. Impassable obstacles between suitable spawning areas and the sea can eliminate breeding populations of shad. Existing passes are often not effective for shad, and any new provisions need to take their requirements into account. Data sources available when determining presence and impacts of in-channel structures may include:	Yes

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			Bullhead - Vertical drops of >18-20 + cm are limiting. Debris dams and woody debris should be retained where characteristic of the river/reach. Units 3 and 4 most important. Shad - No artificial barriers significantly impairing adults from reaching existing and historical spawning grounds. Unit 1.	- Local/management personnel/expert assessment - Hydromorphological and walk-over surveys - River Habitat Survey (RHS) - Air photos Fisheries personnel - Special surveys assessing structures River Obstructions (EA dataset) Rapid assessment methodology to assess obstacles to fish migration (SNIFFER project WFD 111)	
Rivers and streams	Habitat structure Channel and banks	Assess river morphology using RHS In addition, for planform use map data, aerial survey data, historical records and local knowledge.	Channel planform Channel form should be generally characteristic of river type, with predominantly unmodified planform and profile. ≤ 5% of the assessment unit should be artificial, re-aligned or constrained. For planform the target is a score for the assessment unit of at least 3. For naturalness of the profile using transect data the target is a score for the	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 re-profiling. The unobstructed main channel is a key feature supporting the Twaite Shad. Watercourses with a high degree of naturalness will be governed by dynamic processes which result in a	Yes

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			assessment unit of 4 or 5. No RHS site to have any of the eight categories of bank profile modification (Section I in RHS 2003 form) recorded as 'extensive'. Area of Lamprey nursery habitat should be present: Defined as open-structured, aerated, silty and sandy substrates, between 2 and 40cm depth, typically overlain by less than 0.5 m of water. Slack-water channel margins are particularly important, whilst silt accumulations behind weirs can also be valuable in impounded sections. Operations that widen, deepen and/or straighten the channel reduce variations in habitat. New operations that would have this impact are not acceptable, whilst restoration may be needed in some reaches. Presence of dead wood in river in all units is vital. Bullhead has particular associations.	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. 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 semi-natural HMS class 1, with the remainder predominantly unmodified (class 2). Physical targets will need to be adjusted to be compatible with river restoration plans . This includes an analysis of unmodifiable physical constraints to restoration, relating to essential flood protection to people and the built environment).	
Rivers and streams	Habitat structure Channel and	Habitat Modification Score (as	Habitat Modification Score ≥65% or more of condition monitoring	Watercourses with a high degree of naturalness will be governed by dynamic processes which result in	Yes

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	banks	derived from RHS) obtained from the Environment Agency.	sites should fall within the semi-natural HMS class 1, with the remainder predominantly unmodified (class 2). No (or minimal) deterioration from the last monitoring cycle.	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. The Habitat Modification Score (HMS) enables an assessment to be made based on the nature of modifications to a river and their estimated persistence.	
Rivers and streams	Negative indicators Habitat disturbance - invertebrate interest	Examples = Excessive stock access Large poached river margins and siltation of river Invasive species – impatiens glandulifera fallopian spp	Sample area should be random but must also be completed within the same survey sites as the channel form and plant community.	See invertebrates tables in Annex 3 of this document for more extensive detail of the habitats and preferred and negative features and combinations. Showing priority surfaces only here. Others are relevant – see annex 3 table	Yes

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		Extensive marginal scrub leading to shading of macrophytes Removal of timber from in river or banks			
Rivers and streams	Negative indicators Native species (plants)	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.	Targets should be set to register high or increasing cover as unfavourable. i) For blanketweed, epiphytic or other algae, <i>Potamogeton pectinatus</i> or <i>Zannichellia palustris</i> • Cover values over 25% should be considered unfavourable, and should trigger further investigation. • Cover values should not increase significantly from an established baseline ii) For taxa with STRs as follows River types I, II, III – STR 1 or 2 River types V, VI, VII – STR	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. In using MTR, each species is allocated a score dependent on its tolerance to eutrophication; this system cannot be used to assess acidification.	Yes

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			1-3 • Cover values over 25% should be considered unfavourable, but should trigger further investigation. Cover values should not increase significantly from an established baseline.	Expert judgement will be important in assessing the ecological significance of cover values of these species.	
Rivers and streams	Negative indicators Alien/introduced species (plants and animals)	For aquatic and marginal macrophytes the presence of alien species should be noted during the macrophyte survey and the scoring system for naturalness applied. For other organisms contact external organisations (e.g., EA, SEPA, Wye and Usk Foundation,	No high-impact alien species established (i.e., self-sustaining populations). Standard checklists of species are based on those used for WFD assessments. Note: Presence of noxious weeds does not alone suggest unfavourable condition. A site will be assessed as unfavourable when there is good evidence that any non-native species or locally absent species is causing an impact on site integrity.	The main alien aquatic macrophyte species: • giant hogweed (<i>Heracleum mantegazzianum</i>) • Himalayan (Indian) balsam (<i>Impatiens glandulifera</i>) • Japanese knotweed (<i>Fallopia japonica</i>) 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. The SERCON scoring system for naturalness of aquatic and marginal macrophytes is used to assess alien plant species.	Yes

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		EHS, fisheries trusts) for local reports on alien or introduced species.		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. Giant Hogweed, Japanese Knotweed and Himalayan Balsam are all known to be present on the River Wye. Efforts to eradicate these species are ongoing.	
Rivers and streams	Negative indicators Fish introductions	Assessment of stocking consents in relation to guidance on acceptable stocking levels within catchment.	Fish introductions should not interfere with the ability of the river to support self-sustaining populations of characteristic species. Units 1 and 2 are most sensitive. When considering fish stocking consents awareness should be made that stocking may also introduce Signal Crayfish, INNS and pathogens.	Many characteristic species can be affected by fish introductions, through increased predation, competition or genetic introgression, or through disease transfer. The presence of artificially high densities of other fish creates unacceptably high levels of	Yes

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		Liaison with fisheries officer		predatory and competitive pressure on juvenile salmon.	
Rivers and streams	Negative indicators Habitat disturbance - invertebrate interest	Examples = Excessive stock access Large poached river margins and siltation of river Invasive species – impatiens glandulifera fallopian spp Extensive marginal scrub leading to shading of macrophytes Removal of timber from in river or banks	Sample area should be random but must also be completed within the same survey sites as the channel form and plant community.	See invertebrates tables in Annex 2 of this document for more extensive detail of the habitats and preferred and negative features and combinations. Showing priority surfaces only here. Others are relevant – see annex 2 table	Yes

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Audit Trail

Rationale for limiting standards to specified parts of the site

Specific units chosen for species based on known population locations from designation years. Habitats cover whole length of river. Confirmation of data sources required through consultation with EA.

CSMG for rivers (2016) has been used to determine generic site targets. Macrophyte targets updated to 2016 CSMG standards. Site specific phosphate targets have been determined in co-ordination with the EA – [River Wye Updated Phosphate Targets 2022](#) & flow targets have also been determined in co-ordination with the EA. For Unit 4 there is currently no new target set for Phosphate, the target for unit 3 has been used as a proxy whilst further data is collected by the EA – so may be subject to further revision (September 2022 update).

River Habitat Survey (RHS) Protocol -

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1093961/RHS-manual-2003_2022-reprint-LIT-1758.pdf

Holmes (1983) Typing British rivers according to their flora. Focus on Nature Conservation No 4. Nature Conservancy Council, Peterborough.

HES target for all WFD phys-chem parameters added to the water quality assessment. Water quality targets for BOD and DO updated to align with River Wye & CSMG (September 2022 update).

Habitat Structure – Channel & Banks – In channel structures: Habitats and Modification Score; Large Woody Debris, an assessment for General Macroinvertebrate Assemblage & Diatoms have been added as new criteria (September 2022 update – from CSMG Rivers)

Rationale for site-specific targets

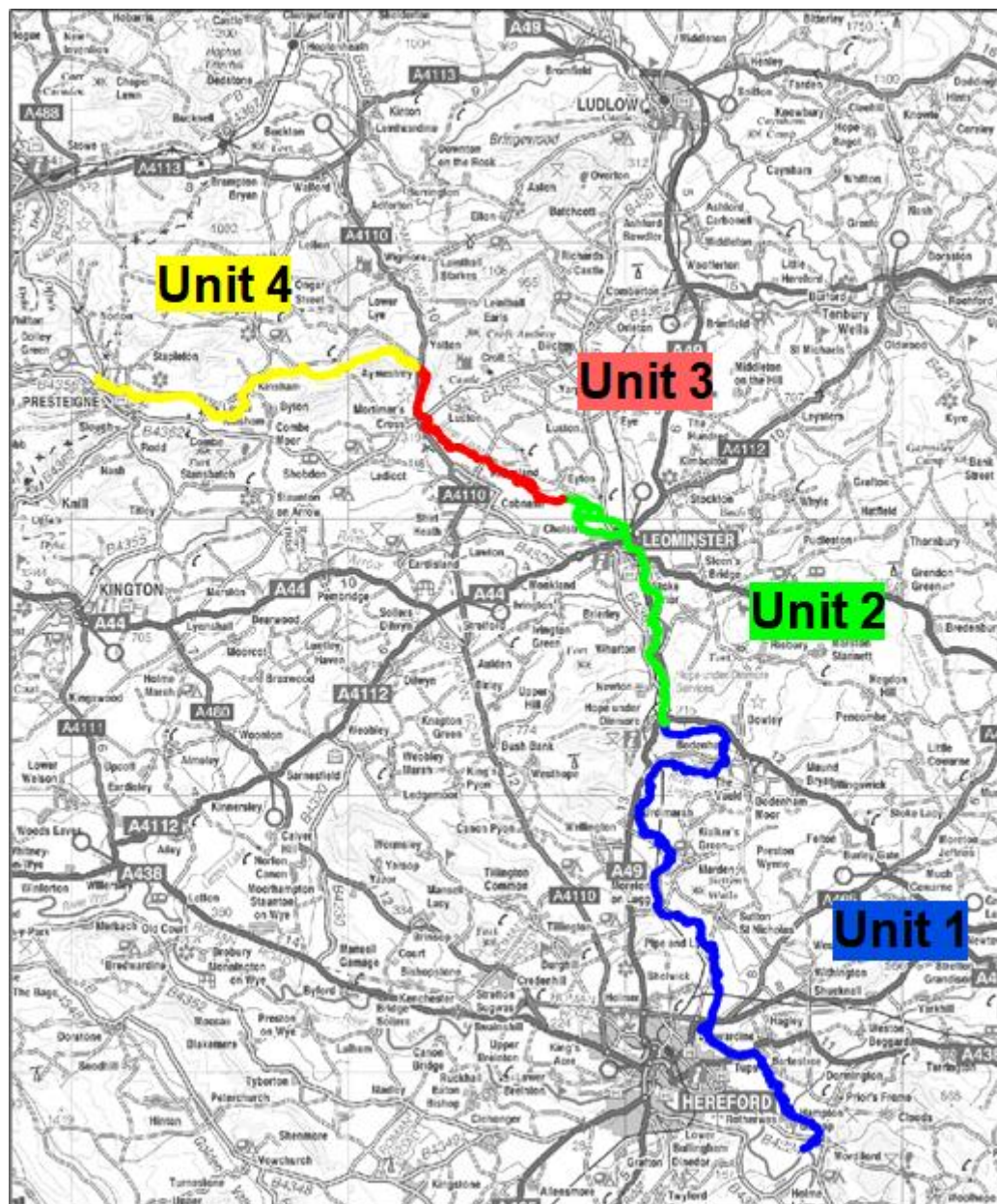
Rationale for selection of measures of condition (features and attributes for use in condition assessment)

(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

River Lugg SSSI & SAC SSSI Units



Annex 2 Tables and data

Table A - The Resource Assessment Management framework (RAM), is essentially a catchment scale tool used to quantify the impacts of artificial influences i.e., abstractions, discharges, and impoundments, on river flow and subsequently water resource availability within a catchment. A series of Assessment Points (APs) are identified at key locations of hydrological, geomorphological, or environmental significance. River units go to principal bridges as named. **River SSSI Unit number**

	Unit Name	CAMS AP number	Corresponding EA Sampling stations (Spt no)	RE Class min	Size (ha)
1	SAC - River Wye - Hampton Court Bridge	10	50050, 50048, 50047, 50044	1	58.87ha
2	Hampton Court Bridge to Leominster	11	50043, 50833, 50042, 51292	2	20.44ha
3	Leominster-Mortimer's Cross	13	na	2	36.27ha
4	Mortimer's Cross-Presteigne	16	50037, 50039	2	26.85ha

Annex 3 Preferred Surface & Features Tables- Invertebrates

3 pages copied from CSM – invertebrates guidance annexes (Feb 08). These show the full combination of habitats, not just the priorities, that should be reviewed during condition assessment.

1. Wetlands: River edges
2. Wetlands: Vegetated Shingle/ Exposed Riverine Sediments
3. Coast: Saltmarsh (the Upper Saltmarsh)

Habitat Type	Surface 0	Surface 1	Surface 2	Surface 3	Surface 4	Surface 5	Surface 6
Wetlands: River Edges	Water	marginal bare muds, wet stones	Medium layer	Taller graminoid layer	young scrub	extensive mature scrub, & trees - (emphasis on edges of unit)	
typical species	Algal mats, water weeds	Thin algal mats	Mentha, Rorippa spp, Veronica beccabungae, Alisma spp	Phragmites, Juncus, Phalaris Sparganium, etc	Salix spp, Alnus	as surface 5 + tree species	
Targets		present in 10% of linear SRSs			present in <20% of linear SRSs	present in <20% of linear SRSs (except where shade dependent fauna is notified feature)	
single surface present in no more than 50% of SRSs							
3+ different surfaces present in at least 20% of SRSs							
Preferred Features							
small areas of bare mud immediately adjacent to water		full range of layers of emergents		floating leaved macrophyte cover in appropriate river types		individual bushes and small areas of scrub or marginal trees, including overhanging trees	
aquatic macrophytes with abundant flowers							
flowery areas, including those on other habitats (verges, farmland, banks, ruderal areas etc) including 'unwelcome' weeds such as ragwort and thistles							
Negative Factors							
excessive stock access leading to loss of macrophytes and large poached river margins and siltation of river		extensive marginal scrub cover leading to shading of macrophytes					
invasive species: - Impatiens glandulifera, Fallopia species							

Definitions of Favourable Condition: (River Lugg) Consultation Draft
(26/09/2022)

Template Version 10, March 2019

Habitat Type	Surface 0	Surface 1	Surface 2	Surface 3	Surface 4	Surface 5	Surface 6
Wetlands: Vegetated Shingle/ Exposed Riverine Sediments	water surface at margin	bare shingle cobbles, muds sand or silt	Sparse vegetation cover	longer swards with some bare substrate	Closed tall herb layer	young / medium scrub	
typical species	possibly algal film	possibly algal film	<i>Anagallis tenella</i> , <i>Papaver spp.</i> , <i>Tripleurospermum maritimum</i> , <i>Potentilla anserina</i> <i>Polygonum maculosa</i> , <i>Barbarea vulgaris</i>	<i>Urtica dioica</i> , <i>Petasites hybridus</i>	<i>Phalaris arundinacea</i> , <i>Oenanthe spp.</i> , <i>Heracleum</i>	Salix, Alder	
Targets		present in 70% of SRSs	present in 30% of SRSs		present in <20% of SRSs	present in <10% of SRSs	
	single surface present in no more than 70% of SRSs						
	2 different surfaces present in at least 20% of SRSs						
Preferred Features							
gravel, shingle & cobbles undisturbed by livestock, vehicles or other trampling small riparian cliffs or micro-cliffs, especially in sandy or clay deposits or south facing flowery areas, including those on surrounding habitats (farmland, grassland, verges, ruderal etc) including 'unwelcome' weeds such as ragwort and thistles		sand banks and shoals sand martin colonies		silt banks in backwaters and other still areas accumulations of plant litter, twigs and larger timber, including tree branches and trunks		areas of <u>sparse</u> vegetation typical of riparian shoals	
Negative Factors							
siltation of river resulting in silt deposition amongst gravel, shingle, cobbles etc interference with natural flow dynamics of river leading to high river levels in summer or low levels and flows in winter invasive species: - <i>Impatiens glandulifera</i> , sallow scrub on shoals, trees and scrub		stock access and trampling removal of timber in water		vehicle access removal of flood litter		gravel or shingle extraction excess shading from trees and scrub	

Habitat Type	Surface 0	Surface 1	Surface 2	Surface 3	Surface 4	Surface 5	Surface 6
Coast: Saltmarsh (the upper saltmarsh)	Brackish water in creeks and pools	Bare sand, silt or mud	Sparse low halophytic vegetation	Taller halophytic / brackish tolerant vegetation	Taller graminoid swards	scrub	
typical species	Algal community, some green seaweeds	unicellular algae or very incomplete filamentous algal film	Salicornia, Cochlearia	Atriplex, Suaeda, Artimisia, Aster, Halimione, Plantago,	Phragmites, Scirpus, Juncus	Salix spp	
Targets		present in at least 20% of SRSs				present in <5% of SRSs	
	single surface present in no more than 50% of SRSs						
	2+ different surfaces present in at least 20% of SRSs						
Preferred Features							
upper strandline litter of both dead graminoid and woody material		natural transition from lower saltmarsh, through upper saltmarsh to other habitat (eg freshmarsh, dunes (including slacks), wet grassland etc		high structural heterogeneity resulting from long history of no grazing		presence of flowering saltmarsh forbs - notable Aster	
pools at various shore levels, including high shore hypersaline pools		flat hard sand/silt at upper edge of creeks and estuaries		vertical erosion clifflets high on the shore, especially (though not exclusively) if sandy		freshwater creeks in the upper shore	
flowery areas, including those on other habitats (verges, sea banks, ruderal areas etc) including 'unwelcome' weeds such as ragwort and thistles							
Negative Factors							
truncated succession through loss of upper saltmarsh, sea bank or concrete or gabion sea defences		loss of forbs and heterogeneity through grazing		over-dominance by grasses resulting from past grazing		introduction of grazing to naturally long - ungrazed saltmarsh	

Key to shading of preferred surfaces

 = preferred surface