European Community Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC)

Fourth Report by the United Kingdom under Article 17

on the implementation of the Directive
from January 2013 to December 2018

Supporting documentation for the
conservation status assessment for the habitat:

H3260 - Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation

ENGLAND

IMPORTANT NOTE - PLEASE READ

- The information in this document is a country-level contribution to the UK Report on the conservation status of this habitat, submitted to the European Commission as part of the 2019 UK Reporting under Article 17 of the EU Habitats Directive.
- The 2019 Article 17 UK Approach document provides details on how this supporting information was used to produce the UK Report.
- The UK Report on the conservation status of this habitat is provided in a separate document.
- The reporting fields and options used are aligned to those set out in the European Commission guidance.
- Explanatory notes (where provided) by the country are included at the end. These provide an audit trail of relevant supporting information.
- Some of the reporting fields have been left blank because either: (i) there was insufficient information to complete the field; (ii) completion of the field was not obligatory; and/or (iii) the field was only relevant at UK-level (sections 10 Future prospects and 11 Conclusions).
- For technical reasons, the country-level future trends for Range, Area covered by habitat and Structure and functions are only available in a separate spreadsheet that contains all the country-level supporting information.
- The country-level reporting information for all habitats and species is also available in spreadsheet format.

Visit the JNCC website, https://jncc.gov.uk/article17, for further information on UK Article 17 reporting.

Report on the main results of the surveillance under Article 17 for Annex I habitat types (Annex D)

NATIONAL LEVEL

1. General information

1.1 Member State	**UK (England information only)**
1.2 Habitat code	**3260 - Water courses of plain to montane levels with the Ranunculion fluitant**

2. Maps

2.1 Year or period	1970-1999
2.3 Distribution map	Yes
2.3 Distribution map Method used	Based mainly on extrapolation from a limited amount of data
2.4 Additional maps	No

BIOGEOGRAPHICAL LEVEL

3. Biogeographical and marine regions

3.1 Biogeographical or marine region where the habitat occurs	**Atlantic (ATL)**
3.2 Sources of information	Mainstone C.P. (2008) The role of specially designated wildlife sites in freshwater conservation - an English perspective. Freshwater Reviews, 1, 89-98. Mainstone, C.P. and Clarke, S.J. (2008) Managing multiple stressors on sites with special protection for freshwater wildlife - the concept of Limits of Liability. Freshwater Reviews, 1, 175-187. Mainstone, C.P., Hall, R. and Diack, I. (2016) A narrative for conserving freshwater and wetland habitats in England. Natural England Research Reports, 2016, Number 064. Chris Mainstone & Alastair Burn (2011) Relationships between ecological objectives and associated decision-making under the Habitats and Water Framework Directives. Discussion paper, Natural England. Mainstone, C.P. et al. (in draft) Recommendations for a shared ecological rationale for more integrated implementation of the nature and water Directives. An output from a Natura 2000 Biogeographical Process Thematic Networking Event, Sarrod, Hungary, 15-17 November 2017. Mainstone, C.P. (2016) Developing a coherent narrative for conserving freshwater and wetland habitats: experiences in the UK. WIRES Water, published Online: Nov 07 2016. DOI: 10.1002/wat2.1189. Mainstone, C.P. (2018) Analysis of Water Framework Directive data for use in Habitats Directive Article 17 reporting on Annex I river habitat (H3260) in England. Supplementary paper for the submission package to Europe, Natural England. Chris Mainstone (2012) Analysis of Water Framework Directive data for use in Habitats Directive Article 17 reporting on Annex I river habitat (H3260) in England. Supplementary paper for the submission package to Europe, Natural England. Mainstone, C.P. and Wheeldon, J. (2016) The physical restoration of English rivers with special designations for wildlife: from concepts to strategic planning and implementation. Freshwater Reviews, 8, 1, 1-25. DOI: 10.1608/FRJ-8.1.927 Natural England (2015) River restoration theme plan. Output from the EU Life project 'Improvement Programme for England's Natura 2000 Sites' (IPENS). Natural England Report number IPENSTP023. River Restoration Centre (undated) The river SSSI restoration programme. http://www.therrc.co.uk/designated-rivers

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Natural England/RSPB (2014) Climate change adaptation manual: evidence to support nature conservation in a changing climate. Available at: http://nepubprod.appspot.com/publication/5629923804839936
Natural England (2015) Climate change theme plan. Output from the EU Life project 'Improvement Programme for England's Natura 2000 Sites' (IPENS). Natural England Report number IPENSTP014
Environment Agency (2012) Summary of outcomes of the Review of Consents on water-related SACs. Excel spreadsheet.
Natural England (2015) Diffuse water pollution theme plan Output from the EU Life project 'Improvement Programme for England's Natura 2000 Sites' (IPENS). Natural England Report number IPENSTP015
Natural England (2015) England Catchment Sensitive Farming Initiative. Evaluation report Phases 1 to 3: 2006-2014.
Chris Mainstone, Ruth Hall, Francois Edwards, Pete Scarlett, Laurence Carvalho, Gearoid Webb, Philip Taylor and Cedric Laize (2018) Developing a coherent framework for assessing priority freshwater habitats in England. Natural England Joint Publication JP016. Available at: http://publications.naturalengland.org.uk/
Environment Agency (2010). Our river habitats -- river habitats in England and Wales: current state and changes since 1995--96. Environment Agency, Bristol.
CABI in the UK (2018) Progress with Weed Biocontrol Projects.
Wheeldon, J. (2018) Progress report on the English river SSSI/SAC physical restoration programme. Paper to the river SSSI restoration project steering group.
Environment Agency (2018) Water Framework Directive surface water classification and objectives reporting database. Excel spreadsheet.
Natural England (2018) Report on H3260 from the CSMi reporting database on SSSI condition and management

4. Range

4.1 Surface area (in km²)		
4.2 Short-term trend Period		
4.3 Short-term trend Direction	Stable (0)	
4.4 Short-term trend Magnitude	a) Minimum	b) Maximum
4.5 Short-term trend Method used		
4.6 Long-term trend Period		
4.7 Long-term trend Direction		
4.8 Long-term trend Magnitude	a) Minimum	b) Maximum
4.9 Long-term trend Method used		
4.10 Favourable reference range	a) Area (km²)	
	b) Operator	
	c) Unknown	No
	d) Method	
4.11 Change and reason for change in surface area of range	No change	
	The change is mainly due to:	
4.12 Additional information		

5. Area covered by habitat

5.1 Year or period			
5.2 Surface area (in km²)	a) Minimum	b) Maximum	c) Best single value

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5.3 Type of estimate			
5.4 Surface area Method used	Insufficient or no data available		
5.5 Short-term trend Period	2007-7-18		
5.6 Short-term trend Direction	Stable (0)		
5.7 Short-term trend Magnitude	a) Minimum	b) Maximum	c) Confidence interval
5.8 Short-term trend Method used	Based mainly on expert opinion with very limited data		
5.9 Long-term trend Period	1994-2018		
5.10 Long-term trend Direction	Stable (0)		
5.11 Long-term trend Magnitude	a) Minimum	b) Maximum	c) Confidence interval
5.12 Long-term trend Method used	Based mainly on expert opinion with very limited data		
5.13 Favourable reference area	a) Area (km²) b) Operator c) Unknown No d) Method		
5.14 Change and reason for change in surface area of range	No change The change is mainly due to:		
5.15 Additional information			

6. Structure and functions

6.1 Condition of habitat	a) Area in good condition (km²)	Minimum	Maximum
	b) Area in not-good condition (km²)	Minimum	Maximum
	c) Area where condition is not known (km²)	Minimum	Maximum
6.2 Condition of habitat Method used	Insufficient or no data available		
6.3 Short-term trend of habitat area in good condition Period	2007-2018		
6.4 Short-term trend of habitat area in good condition Direction	Uncertain (u)		
6.5 Short-term trend of habitat area in good condition Method used	Insufficient or no data available		
6.6 Typical species	Has the list of typical species changed in comparison to the previous reporting period? No		
6.7 Typical species Method used			
6.8 Additional information	Using WFD data on all WFD waterbodies in England (bearing in mind the uncertainties outlined in Note 6.1), and even if all of the 30% of waterbodies that are classified as Heavily Modified (and therefore damaged beyond the point at which they could be restored to good condition in the context of Article 17 reporting) are excluded, only 0.3% of waterbodies in England are at high ecological status and therefore definitely in good condition for Article 17 reporting purposes (these specific waterbodies are unlikely to constitute H3260). Data on protected sites (SSSIs and SACs) indicate that 3 river units, constituting 3% of the SSSI/SAC area for H3260 (and a much smaller percentage of the overall H3260 resource including that outside of protected sites), are in 'favourable' condition and therefore good condition for Article 17 reporting purposes. Any		

combination of this information leads to a conclusion that less than 5% of the habitat resource is in good condition. Only the protected site data specifically on H3260 can be treated with confidence - the total area of the 3 SSSI/SAC units in favourable codition is 1.1km2.
The best available minimum estimate possible of the area not in good condition is the total area of WFD waterbodies in moderate, poor or bad ecological status. This amounts to 57,944 ha or 579.4 km2 (this excludes heavily modified waterbodies although some should definitely be included in the estimate).
The area of WFD waterbodies judged to be at good ecological status comes to 12,135 ha or 121.3km2. Given the range of habitat condition covered by this ecological status class, this area of habitat cannot be assigned to either good or not good condition for Article 17 reporting purposes and should be considered as being of unknown condition.

7. Main pressures and threats

7.1 Characterisation of pressures/threats

Pressure	Ranking
Invasive alien species of Union concern (I01)	H
Mixed source pollution to surface and ground waters (limnic and terrestrial) (J01)	H
Modification of hydrological flow (K04)	H
Physical alteration of water bodies (K05)	H
Temperature changes (e.g. rise of temperature & extremes) due to climate change (N01)	H
Forestry activities generating pollution to surface or ground waters (B23)	M
Hydropower (dams, weirs, run-off-the-river), including infrastructure (D02)	M
Mixed source air pollution, air-borne pollutants (J03)	M
Droughts and decreases in precipitation due to climate change (N02)	M
Increases or changes in precipitation due to climate change (N03)	M

Threat	Ranking
Invasive alien species of Union concern (I01)	H
Mixed source pollution to surface and ground waters (limnic and terrestrial) (J01)	H
Modification of hydrological flow (K04)	H
Physical alteration of water bodies (K05)	H
Temperature changes (e.g. rise of temperature & extremes) due to climate change (N01)	H
Forestry activities generating pollution to surface or ground waters (B23)	M
Hydropower (dams, weirs, run-off-the-river), including infrastructure (D02)	M
Mixed source air pollution, air-borne pollutants (J03)	M

Droughts and decreases in precipitation due to climate change (N02)	M
Increases or changes in precipitation due to climate change (N03)	M

7.2 Sources of information

7.3 Additional information

8. Conservation measures

8.1 Status of measures	a) Are measures needed?	Yes
	b) Indicate the status of measures	Measures identified and taken
8.2 Main purpose of the measures taken		Restore the habitat of the species (related to 'Habitat for the species')
8.3 Location of the measures taken		Both inside and outside Natura 2000
8.4 Response to the measures		Short-term results (within the current reporting period, 2013-2018)
8.5 List of main conservation measures		

Management, control or eradication of established invasive alien species of Union concern (CI02)
Reduce impact of mixed source pollution (CJ01)
Restore habitats impacted by multi-purpose hydrological changes (CJ03)
Implement climate change adaptation measures (CN02)
Reduce diffuse pollution to surface or ground waters from forestry activities (CB10)

8.6 Additional information

9. Future prospects

9.1 Future prospects of parameters	a) Range b) Area c) Structure and functions
9.2 Additional information	

10. Conclusions

10.1. Range

10.2. Area

10.3. Specific structure and functions (incl. typical species)

10.4. Future prospects

10.5 Overall assessment of Conservation Status

10.6 Overall trend in Conservation Status

10.7 Change and reasons for change in conservation status and conservation status trend	a) Overall assessment of conservation status No change The change is mainly due to:

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	b) Overall trend in conservation status No change The change is mainly due to:
10.8 Additional information	

11. Natura 2000 (pSCIs, SCIs, SACs) coverage for Annex I habitat types

11.1 Surface area of the habitat type inside the pSCIs, SCIs and SACs network (in km² in biogeographical/ marine region)	a) Minimum b) Maximum c) Best single value 29.5
11.2 Type of estimate	Best estimate
11.3 Surface area of the habitat type inside the network Method used	Based mainly on extrapolation from a limited amount of data
11.4 Short-term trend of habitat area in good condition within the network Direction	Uncertain (u)
11.5 Short-term trend of habitat area in good condition within network Method used	Based mainly on expert opinion with very limited data
11.6 Additional information	

12. Complementary information

12.1 Justification of % thresholds for trends	
12.2 Other relevant information	

Distribution Map

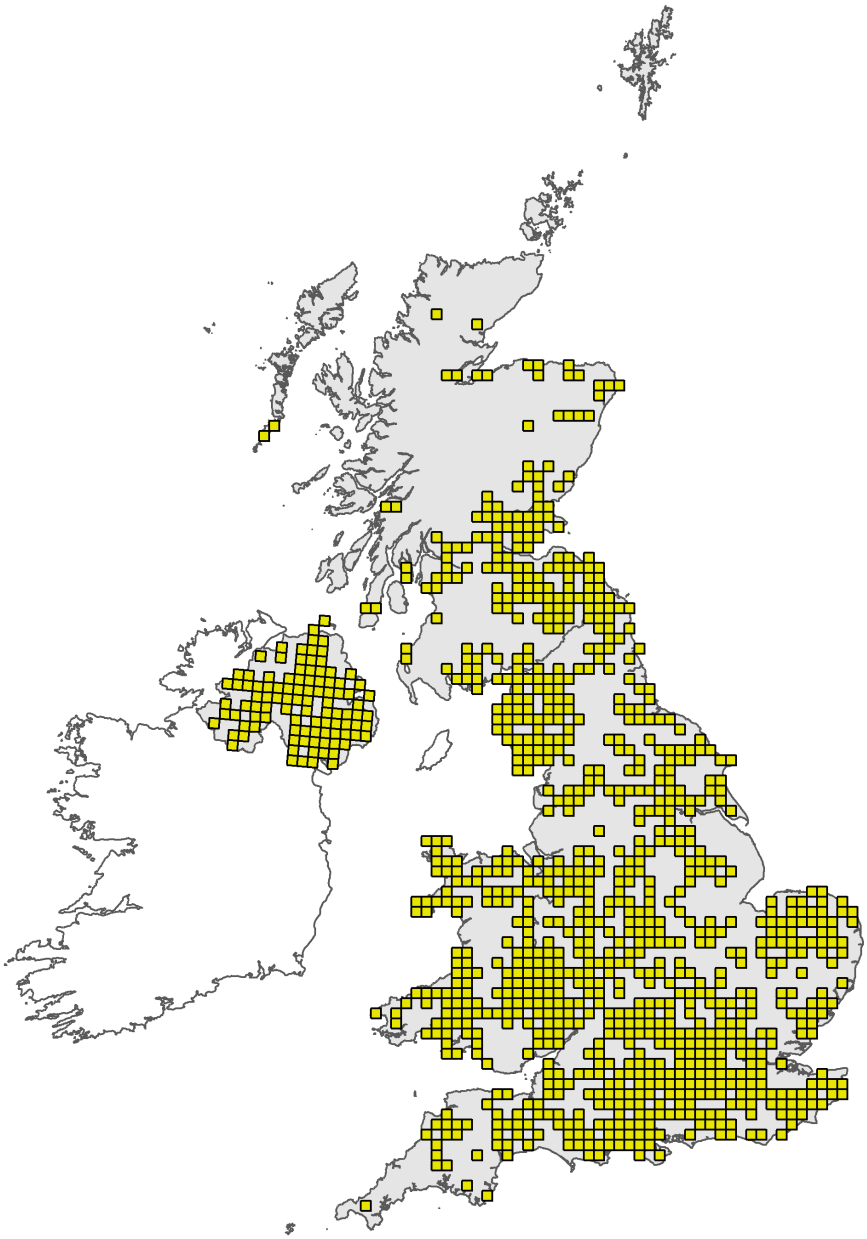

Figure 1: UK distribution map for H3260 - Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation. Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

The 10km grid square distribution map is based on available habitat records which are considered to be representative of the distribution within the current reporting period. For further details see the 2019 Article17 UK Approach document.

Range Map

Figure 2: UK range map for H3260 - Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation. Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

The range map has been produced by applying a bespoke range mapping tool for Article 17 reporting (produced by JNCC) to the 10km grid square distribution map presented in Figure 1. The alpha value for this habitat was 25km. For further details see the 2019 Article 17 UK Approach document.

Explanatory Notes

Habitat code: 3260

Field label	Note
2.2 Distribution map	The distribution data used are the same as those used in previous reporting rounds.
2.3 Distribution map; Method used	Map is based on the presence of relevant Ranunculus species, from survey data collected by the SNCBs and assembled in the UK River Macrophytes Database. It is considered to be a reasonably good representation of the distribution of the habitat, reflecting its widespread occurrence in England. However, it is only a broad reflection of distribution, since 1) it is based on survey of limited numbers of river sections compared to the likely total extent of H3260, 2) some occurrences of these species will relate to standing waters and 3) the habitat occurs without the presence of Ranunculus species in some instances. In some cases the H3260 plant assemblage may be present because of hydraulic changes to the river caused by physical or hydrological modifications (e.g. below dams) - in these cases it is not the natural assemblage of the river and would not normally be a suitable conservation objective.

Habitat code: 3260 Region code: ATL

Field label	Note
10.6 Overal trend in Conservation Status	For England the trend is considered to be improving.
4.3 Short term trend; Direction	River habitat is not generally lost from an area, but is rather degraded through a range of pressures
4.7 Long term trend; Direction	Habitat range does not tend to change as river habitat is generally not lost or gained within any given geographical area - anthropogenic impacts tend to result in deterioration of the habitat rather than loss, although river straightening causes loss of river length.
4.8 Long term trend; Magnitude	Habitat range does not tend to change as river habitat is generally not lost or gained within any given geographical area - anthropogenic impacts tend to result in deterioration of the habitat rather than loss, although river straightening causes loss of river length.
4.11 Change and reason for change in surface area of range	The same data have been used in this reporting round as previous reporting rounds. Habitat range does not tend to change as river habitat is generally not lost or gained within any given geographical area - anthropogenic impacts tend to result in deterioration of the habitat rather than loss, although river straightening causes loss of river length.

5.2 Surface area	Value not supplied. There are no comprehensive data available for the area of this habitat type in the UK. It is a widespread habitat within an extensive river network. Macrophyte surveys provide point data on the river network, but are difficult to extrapolate to the wider river network due to the lack of a predictive model. It has been previously estimated that there are about 2,500 km length of river which have records of Ranunculus cover in England and Wales (see previous Article 17 reports). This is based on records within the UK river macrophyte database, which only covers a proportion of the UK river network (albeit many of those with the highest abundances of submerged macrophytes). In particular, headwaters are generally poorly represented in the database - headwaters account for a large proportion of total river length. In addition, Ranunculus cover does not characterise the whole H3260 resource, since some communities falling under the H3260 definition contain no Ranunuculus species. For all of these reasons, a value of 2500km is likely to underestimate the resource by a considerable amount, particularly if headwaters are considered. Whilst there has been a significant historical loss of habitat area caused by channelisation works, as reported in previous reporting rounds, there has been no significant change in area over the short-term and long-term trend periods specified in this reporting round. Key issues for this habitat relate to habitat condition (structure and functions) rather than changes in habitat area. River length would be a more appropriate basis for assessing H3260 habitat area and should be considered for future reporting once a reasonably reliable estimate has been generated from predictive modelling. A new project is currently being planned to predict the distribution (and hence surface area) of H3260 in the English river network, which may be extended to cover the whole of the UK. This will be based on the prediction of natural hydraulic and geomorphological conditions using available GIS datasets, to determine river stretches conducive to the development of abundant submerged higher plants. Attempts are being made to make the outputs of the work compatible with developments of the EUNIS classification.
5.6 Short term trend; Direction	Habitat area does not tend to change as river habitat is generally not lost or gained within any given geographical area - anthropogenic impacts tend to result in deterioration of the habitat rather than loss, although river straightening causes loss of river length.

6.1 Condition of habitat

Estimates of total habitat area in good/not good condition have not been provided in these fields due to high uncertainties in the data, including the extent of H3260 in the river network particularly in headwater streams which make up a large proportion of total river length), and difficulties in relating WFD ecological status data to data on the condition of SACs and SSSIs. The assessment below provides the best understanding possible of the condition of the H3260 resource, based on estimated relative proportions of parts of the habitat resource in different levels of condition. The additional field 6.8 is used to highlight the most important information from that given below. Assessment of the condition of SACs and nationally designated sites (SSSIs) provides a direct source of data on the condition of H3260 habitat. These assessments are based on evaluation of the environmental integrity of the habitat (in relation to water quality, hydrology, morphology, non-native species and some aspects of the status of the characteristic biological community. A total of 108 reporting units of river SAC/SSSI are recorded as containing H3260, of which 3 (3%) are recorded as favourable, 44 (41%) are currently recorded as Unfavourable recovering, 49 (45%) are recorded as Unfavourable no change and 4 (4%) as Unfavourable declining. The most recent assessments of these units range from 2005 to 2013. Eight units (7%) where H3260 is present are currently reported as not assessed. There are typically multiple reasons for Unfavourable condition, which need to be addressed in a coordinated way to move SACs and SSSIs for H3260 to Unfavourable recovering and ultimately Favourable condition. The large percentage of area recorded as Unfavourable recovering reflects the complex planning and lengthy timescales needed to resolve many of the key pressures on river systems. The most common causes of Unfavourable no-change and Unfavourable declining conditionare non-native species (30% of units), abstraction (28%), siltation (18%), agricultural pollution (17%) and effluent discharges (18%). Beyond SACs and nationally designated sites, the main source of data on habitat condition is the Water Framework Directive (WFD) . The WFD reports on the ecological status of rivers that form part of defined 'waterbodies'. Headwater streams, which form a large proportion of total river length (some of this will be H3260), are not a focus of WFD monitoring in England, so a considerable proportion of the river network is not assessable using WFD data other than through extrapolation of available data. Ecological status is defined in terms of a number of biological quality elements: the phytobenthos (algae and submerged higher plants), macroinvertebrates and fish, as well as the nutrient status of waterbodies. A number of environmental standards are also defined that support ecological status. Status categories are high, good, moderate, poor and bad. Where significant anthropogenic modifications are present in a waterbody, which cannot be removed to restore good ecological status, the waterbody is designated as 'heavily modified' under the WFD and an objective is assigned in terms of ecological potential. There is no simple relationship between favourable condition of H3260 habitat (as defined for use in SACs and nationally designated sites) and ecological status classes. In fact, some attributes of habitat condition used in the assessment of SACs and nationally designated sites are not directly addressed by ecological status assessment (e.g. impacts on riparian habitats) or are only included in the assessment of high ecological status (e.g. impacts on physical habitat quality, flow modifications and the presence of non-native species). However, for most biological and environmental indicators that are used in both condition assessment of SACs/SSSIs and WFD assessment, favourable condition is most closely associated with high ecological status. See Mainstone and Burn, (2011) in Field 3.2 (Sources of information) for futher explanation. Levels of habitat condition consistent with ecological potential objectives are set in relation to site-specific constraints and cost-benefit considerations and are not amenable to general comparison with favourable condition as defined for SACs and SSSIs. Mainstone (2018) in Field 3.2 provides summary statistics of WFD ecological status data in relation to H3260. All WFD river waterbodies (excluding ones designated as artificial by the WFD) were used to generate these statistics, since there is no reliable way of identifying rivers across the English river network that conform to

	H3260. H3260 is known to occur in a range of river types such that the condition of the whole WFD river network should provide a reasonably reliable impression of the condition of the H3260 resource outside of the protected site network, at least in terms of the way in which the WFD assesses habitat condition. About a third of all WFD river waterbodies in England have been designated as heavily modified and therefore have objectives relating to ecological potential rather than ecological status. Of those waterbodies not designated as heavily modified, only 0.3% are recorded at hes overall, 18.2% are recorded at ges, and around 81% are currently recorded at less than ges. This assessment is based on the worst performing quality element making up the assessment (biological quality elements and nutrient levels). Looking at some key biological indicators and supporting environmental criteria can provide greater resolution on impacts on structure and function. However, this is limited by the sensitivity of some of the WFD indicators used. River hydrology and morphology are considered consistent with ges if physical modifications do not interfere with biological indicators achieving ges, yet these biological indicators (including their sampling methods) are not sensitive to impacts on hydrology and physical habitat mosaics. This means that rivers can be considerably physically modified but still be judged to be consistent with ges. It is also evident that any waterbody that has been judged to be of less than ges due to exisiting impacts has been designated as a heavily modified waterbody. The third of WFD river waterbodies in England that are designated as heavily modified and are clearly also not in good condition and will have significant constraints on the extent to which they can be restored. It is likely however that many are a considerable way from achieving their potential.
6.2 Condition of habitat; Method used	A combination of data on protected sites (SSSI and SACs) and Water Framework Directive waterbodies has been analysed (see Field 3.2). It should be noted that the H3260 habitat resource is extensive and widespread, and monitoring is only undertaken at discrete points in the resource, and at certain times - results have to be extrapolated to the wider H3260 resource.
6.3 Short term trend of habitat area in good condition; Period	Condition data on protected sites is not adequate to quantify changes over this time period - there have been too few recent condition assessments of protected sites (SSSIs and SACs). WFD data provides scope for more quantitative assessment of trends.
6.4 Short term trend of habitat area in good condition; Direction	Changes in the boundary values of WFD ecological status classes, and in the standards for supporting environmental conditions, make it unclear whether apparent trends in WFD classification data are real (see Mainstone 2018) in Field 3.2 - Sources of information). It seems likely that differences in data from the two Article 17 reporting periods are due mainly to method changes, although given the restoration activities reported in Field 8 there have been at least limited improvements in the condition of H3260 structure and functions (inside and outside of specially protected sites), some of which may translate into real increases in the area in good condition of structure and functions.
6.5 Short term trend of habitat area in good condition; Method used	A considerable amount of WFD data is available and has been used in making this assessment.

8.1 Status of measures

Pressure/threat J01 (Pollution) - There is a wide range of pollutant types and pollution sources, varying in importance from site to site. Eutrophication, organic pollution, enhanced sediment loads, toxic pollution, acidification. All have their characteristic effects on the characteristic biota of the habitat. Some are widespread (e.g. eutrophication) and some relatively localised (e.g. toxic pollution). For descriptions of effects of nutrient enrichment and organic pollution see references in Field 3.2. Pressure/threat I02 (Invasive non-native species) - There is a range of riparian plant species and in- channel animal species affecting biological community composition and habitat integrity of H3260. This is set to worsen as further species arrive from Europe, particularly species of Ponto-Caspian origin colonising via the Rhine-Danube canal. In riparian areas, Himalayan balsam, Japanese knotweed and Giant hogweed are widespread, excluding/suppressing native plant species and fundamentally altering vegetative riparian habitat. In the river channel, a range of non-native crayfish species are causing considerable community and physical habitat change and excluding our only native crayfish, Austropotamobius pallipes (which is characteristic of many H3260 watercourses). Dreissena polymorpha is extending its already significant presence and Dikerogammarus villosus and D haemobaphes are now apparently established in England and set to spread. American mink has dramatically reduced water vole numbers across much of its natural range, although this effect is declining following concerted trapping effort and the return of the otter to many English rivers. Chinese mitten crab is set to extend its range upstream from the estuarine habitats it first colonised. Pressure/threat K04/K05 (Modification of hydrological flow and alteration of physical habitat) - These are extensive in the English H3260 habitat resource. Historical channel modifications have created loss of river length, reduced habitat complexity, stabilised water levels and siltation, all leading to loss of a range of habitat niches including ephemeral marginal and in-channel habitats. In-channel impounding structures have restricted biological movements for much of the biota, dramatically so for some species such as allis shad. Flow modifications due to flow regulation, diversion and abstraction have generally reduced the level of rheophilism in the biological community, affecting plants, fish and invertebrates adapted to higher or more variable current velocities. Abstraction and diversion also affects habitat extent, resulting in rivers of smaller size as well as power. For a description of the ecological effects of flow modifications see reference in Field 3.2.. Hydropower generation became a major concern in the last Article 17 report - although the threat has diminished recently it may increase again depending on the attractiveness of the feed-in tariffs offered. The conflicting objectives of renewable energy generation to help combat climate change on the one hand, and the need to restore the morphological and hydrological condition of H3260 habitat on the other (in part to improve resilience to climate change), present a major challenge. Pressure/threat N01/N02/N03 (Climate change impacts) - Climate change is already starting to alter the hydrological and thermal regimes of the habitat, and through altered patterns of run-off the delivery of diffuse pollutants (see NE/RSPB climate change handbook in Field 3.2 (sources of information). Possible increases in flood risk as a result of flashier rainfall events may lead to increased pressure to further engineer channels and banks for flood risk management and thereby further degrade H3260 habitat, even though improved flood management can be achieved through a catchment-based approach working with natural river processes. The nature of the habitat will change as a result of climate change and species will change their distribution as a result. The distribution of cool-water species will contract towards upstream/higher altitude areas, within the hydraulic and other environmental tolerance ranges of each species and dependent on unimpeded colonisation pathways. Within the English river SAC network, and to a lesser extent the wider network of nationally designated rivers, considerable effort has been expended on the development and implementation of strategic plans aimed at restoring the condition of the river habitat, including H3260 (see Mainstone and Clarke 2008 and Mainstone et al. 2016 in Field 3.2 for an explanation of the strategy adopted and underlying ecological

rationale). Beyond the designated site network, management measures for H3260 are largely governed by the Water Framework Directive. Within the first round of river basin management planning (RBMP), a considerable amount of WFD-related effort was expended on confirming, and investigating the causes of problems with, ecological status. In the current second round of RBMPs more restoration action is being undertaken. There have been efforts to better harmonise plans and activities under the WFD and Habitats Directive (see Mainstone 2008, Mainstone et al. 2016 in Field 3.2 for further discussion of harmonisation issues) but further work is needed. Mainstone et al. (in draft) outline a shared ecologically-based rationale for protecting and restoring freshwater habitats at European level, which it is hoped will provide the basis for greater hamonisation. An account of the main types of conservation measure is given below. CJ01 The England Catchment Sensitive Farming Initiative is continuing to promote a range of best agricultural practices to reduce pollution loads to priority aquatic sites, including a range of river SACs and nationally designated rivers(SSSIs) with H3260 (see link in Field 3.2 for further details). The initiative is voluntary and uses awareness-raising and incentives to bring about management change. Modelling has predicted benefits in terms of reduced pollution loads, but it is still unclear how far a voluntary approach will go towards achieving favourable conditions for the habitat. Investigations are being undertaken into the use of regulatory measures such as Water Protection Zones to generate the necessary changes in agricultural activities that it has not been possible to bring about through voluntary and incentivised means. In addition to Catchment Sensitive Farming, work has continued to implement the review of discharge consents affecting the Natura network in England. Further phosphorus removal processes have been fitted to sewage effluents under the water industry's programme of strategic improvements. In respect of discharge consents affecting SACs designated for H3260, 108 are being modified, 7 are being revoked and one is being surrendered. However, further investigations are needed into the application of new best available technology for phosphorus removal, as well as the need for action on rural unsewered populations. Pollution plans have been drawn up that include addressing these issues in relation to SACs and nationally designated sites, and are in the process of being implemented. CJ03 (Addressing physical alteration of waterbodies) - The major programme of physical restoration on the SAC/SSSI river network is continuing (see Mainstone and Wheeldon 2016 in Field 3.2), and has been very successful in restoring natural form and function in H3260 habitat in many places. A long-term strategic plan has been developed for each river and phased implementation of those plans is well underway (see references in 3.2 for details of the programme). These plans address key issues such as dams and weirs, channelisation, flood embankments, bank reinforcements, lack of riparian habitat, lack of riparian trees and lack of woody debris in the channel. The development and implementation of these plans is providing an important strategic focus for river restoration on the SAC/SSSI river series and is valuable in promoting a strategic approach on the wider H3260 resource based on restoring natural ecosystem function. Outside of the SAC/SSSI series practical measures have focused on addressing the many weirs and dams on the river network in England. The general WFD aim is to remove problem structures where possible, or if not then to reduce their impacts on fish migration. CJ03 (Addressing changes to hydrological flows) - Plans to address abstraction stress on SAC and SSSIs river are progressing slowly. The conclusions of the review of abstraction licences on the English Natura series are still in the process of being implemented. In respect of those licences affecting SACs designated for H3260, 10 are being served closure notices, 111 are being modified, 15 are being revoked and 9 are being surrendered. This work includes major works to restore sustainable levels of abstraction on the Rivers Test and Itchen (two iconic rivers for H3260 habitat), which have recently been agreed with the relevant water company. As with physical restoration of rivers, modifying abstraction regimes to restore the natural flow regime is a long-term endeavour, and is made more difficult by on-going development associated with population increases as well as

	climate change. CI02 - Non-native species continue to be a major challenge in terms of establishing robust prevention and control frameworks., even on the designated site network. Lack of robust and practical control methods for NNS, and difficulties in controlling spread to new locations, limit the effectiveness of management. Despite this, a range of local initiatives has been established to map species, contain spread and reduce distribution through control action where possible. Biological control techniques are being developed for a number of non-native invasive riparian and aquatic plant species (see the factsheet in Field 3.2). A native pathogen of Himalayan balsam has been licensed for release since the last Article 17 reporting round, and is now being introduced into targeted areas with success. A pathogen of Japanese knotweed has also been licensed although its efficacy has been found to be quite limited. Research efforts aimed at finding effective control methods for signal crayfish continue but with little success as yet - the use of sterilisation and baited traps are currently being trialled.
8.2 Main purpose of the measures taken	The largest impact on the H3260 resource has been on natural habitat structure and functions. Some reductions in habitat exent have historically occurred but these are related to loss of natural function, and are addressed if natural function is restored as far as possible.
8.3 Location of the measures taken	There has been greater strategic planning of measures for SACs than for the wider environment, although a range of relevant measures outside of the Natura network have been included in WFD river basin management plans.
8.4 Response to the measures	Significant improvements in the structure and functions of the H3260 resource have already been made as a result of the conservation measurtes employed. Further improvements can be expected in the short- and medium-term but implementation of restoration plans is a long-term process and full restoration of the habitat resource will take many years.
9.1 Future prospects of parameters	Whilst restoration of natural river length is being achieved at some sites through restoration of natural riverine processes (particularly in river SACs and SSSIs), it seems unlikely this will be a widespread phenomenon across the river network. The prospect of significant restoration of natural water quality, hydrology and morphology in SAC and SSSI rivers is good, but parallel improvements in the H3260 resource in the wider river network are likely to be more limited. Any improvements due to conservation measures need to be set against increases in pressures from climate change and population growth/development.
10.1 Range	For England this is considered to be Favourable. Historical losses in habitat area (due to channelisation work) have resulted in localised shortening of river length, not complete elimination of the river habitat within a geographical area. The range has remained stable since 1994 and the current range is considered viable.
10.2 Area	For England this is considered to be inadequate. There has been a historical decline in area, due to reductions in river length as a result of land drainage activities and flood risk management (and resultant loss of ecological variation in the remaining river length subject to these activities). However, the area of H3260 is considered to be viable.

10.3 Specific structure and functions	For England this is considered to be bad based on the estimated relative proportions of habitat area in good/not good condition. Habitat structure and functions are heavily degraded by a range of anthropogenic chemical, hydrological, physical and biological interventions on a large scale. The geographical influence of these interventions varies but covers the entire range of the habitat, with some being most keenly felt in the uplands (such as acidification), and others being most keenly felt in the lowlands (e.g. physical habitat degradation). The rigid thresholds used for habitat area in good/not good condition used to assess structure and functions are difficult to apply to rivers, as well as other freshwaters. The reasons for this relate to differences in judgements of what constitute 'good' inside and outside of the protected site network. The issues are complex, but include the widespread nature of H3260 habitat, its extensive occurrence outside of the protected site network, the multiple pressures on it variation in restoration ambition inside and outside of protected sites, and the need to use both WFD data and protected site condition data in the assessment of structure and functions across the habitat resource. It is recommended that the approach to judging structure and functions for H3260 and other Annex I river types is discussed at the Biogeographic region freshwater specialist network, with a view to developing proposals for an appropriate and consistent approach to the issue across Member States.
10.4 Future prospects	For England these are considered to be inadequate. Whilst a range of conservation measures are being applied to the H3260 habitat resource within SACs, further development and implementation of strategic plans is needed to provide confidence that favourable condition of the river SAC network will be achieved over suitable timescales. Overall, the future prospects for H3260 in the SAC network are good (and reasonable for the SSSI network) - however, the achievement of favourable condition of these designated sites depends on concerted and coordinated action on a range of major and complex pressures, meaning that moving from Unfavourable recovering to Favourable condition is likely to be a slow process requiring the maintenance of strategic effort and investment over long timescales. Even then, new development pressure and climate change are major obstacles. Given that effort under the WFD is dispersed across the whole of the surface water network, the rate of progress is slower outside of the designated site network , and the level to which habitat condition is being restored is not as great. Considerable progress in alleviating key pressures can be expected by 2025, but WFD objectives will inevitably aim to restore a lower level of habitat integrity to the wider H3260 resource than on the SAC and nationally designated river network. Greater harmonisation between Natura objectives and Water Framework Directive objectives and associated standards and targets, and more integrated and strategic planning of measures, is required to ensure that water management delivers Natura objectives. In the wider H3260 habitat resource, a common understanding is required about how far habitat integrity can realistically be restored, considering a range of time horizons and allowing for/building in technological improvements to management responses. See Mainstone et al. 2016 and other references in Field 3.2 for further discussion of the strategic rationale required.
10.7 Change and reasons for change in conservation status and conservation status trends	Not in England
11.1 Surface area of the habitat type inside the pSCIs, SCIs and SACs network	This figure assumes that all of the area within a unit of a SAC in which H3260 is contained is H3260. Given that H3260 is a holistic habitat feature comprising the river channel and its riparian zone, and river SACs and associated units are largely delineated in the same way, then this seems a reasonable assumption.

11.4 Short term trend of habitat area in good condition within the network; Direction	Condition data on protected sites is not adequate to quantify changes - there have been too few recent condition assessments of sites. Although restoration measures acting on some presssures have been applied in many cases, a range of measures needs to be applied to bring about a change to good condition.
11.5 Short term trend of habitat area in good condition within the network; Method used	In the absence of recent condition data for many protected sites, expert opinion has been applied based on a knowledge of conservation measures applied.