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

WALES

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 (Wales 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	1998-2018
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	Baxter, E., McKenzie, S., Jones, C., Jones, D. and Metcalfe, P. 2017. Condition assessment using 2016 River Habitat Survey data and Common Standards Monitoring guidance for the Afon Teifi and Afon Eden - Cors Goch Trawsfynydd SACs. NRW Evidence Report No: 192, 95 pp. NRW, Bangor. Broughton DA, Southey J. 2008. Macrophyte Condition Assessment for the Afon Gwyrfai SAC. CCW Contract Science Report No 817. Clarke S, Lansdown R, Birkinshaw N. 2009. Determining the main variability components for macrophyte communities in rivers: JNCC and LEAFPACS macrophyte surveys on the River Dee. CCW Contract Science Report No. 852. CCW, Bangor. Clews E, Ormerod SJ. 2009. Improving bio-diagnostic monitoring using simple combinations of standard biotic indices. River Research and Applications 25:348-361. Clews E, Ormerod SJ. 2010. Appraising riparian management effects on benthic macroinvertebrates in the Wye River system. Aquatic Conservation: Marine and Freshwater Ecosystems 20:S73-S81. Davy-Bowker J, Hammett MJ, Mauvisseau Q, Sweet MJ. 2018. Rediscovery of the critically endangered 'scarce yellow sally stonefly' Isogenus nubecula in United Kingdom after a 22 year period of absence. Zootaxa 13: 295-300. DOI: 10.11646/zootaxa.4394.2.12. Dobson M, Naura M, McElhone M. 2009. Welsh rivers under threat: physical factors. In: The Rivers of Wales - A Natural Resource of International and Historical Significance, 205-222, Backhuys, Leiden. Environment Agency. 2012a. Dee River Basin Management Plan. Available online at http://www.environmentagency.gov.uk/research/planning/124748. Environment Agency. 2012b. Severn River Basin Management Plan. Available online at http://www.environmentagency.gov.uk/research/planning/124941. Environment Agency. 2012c. Western Wales River Basin Management Plan. Available online at http://www.environmentagency.gov.uk/research/planning/125095. Garrett HM. 2016. River Usk SAC habitat structure condition assessment using 2013 - 2015 RHS data & Common Standards Monitoring guidance. NRW Evidence Report No. 142, 28pp., NRW, Dolgellau. Garrett HM and Thomas RH. 2016. River habitat condition assessment using

2013 & 2014 RHS data & CSM standards for River Wye SAC. NRW Evidence Report No. 141. 29pp., NRW, Bangor.
Harrison R, Willby N, Clarke S, Birkinshaw N. 2013. SAC Monitoring of Ranunculion Plant Community Attributes in mid Wales Rivers. CCW Science Report No: 1034. 111pp. CCW, Bangor.
Hatton-Ellis TW, Grieve N, Newman J. 2003. Ecology of watercourses characterised by Ranunculion fluitantis and Callitricho-Batrachion vegetation. 11. Peterborough, English Nature. Conserving Natura 2000 Rivers Ecology Series.
Hatton-Ellis TW, Blackstock TH, Orange A. 2009. Life in Welsh rivers: plants. In: The Rivers of Wales - A Natural Resource of International and Historical Significance, 69-88, Backhuys, Leiden.
Holmes NTH, Boon PJ, Rowell TA. 1999. Vegetation Communities of British Rivers. Peterborough, Joint Nature Conservation Committee.
Holmes, NTH, Boon PJ, Rowell TA. 1998. A revised classification system for British rivers based on their aquatic plant communities. Aquatic Conservation: Marine and Freshwater Ecosystems 8:555-578.
Larsen S, Pace G, Ormerod SJ. 2011. Experimental effects of sediment deposition on the structure and function of macroinvertebrate assemblages in temperate streams. River Research and Applications 27:257267.
Lewis, BR, Juttner I, Reynolds B, Ormerod SJ. 2007. Comparative assessment of stream acidity using diatoms and macroinvertebrates: implications for river management and conservation. Aquatic Conservation: Marine and Freshwater Ecosystems 17:502-519.
Natural Resources Wales. 2013. Supporting documentation for the Third Report by the United Kingdom under Article 17 on the implementation of the Directive from January 2007 to December 2012. Conservation status assessment for Habitat: H3260 - Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation.
Ormerod S, Juettner I. 2009. Pollution effects on Welsh rivers: A damaged past, an uncertain future? In: The Rivers of Wales - A Natural Resource of International and Historical Significance, 205-222, Backhuys, Leiden.
Ormerod SJ, Durance I, Hatton-Ellis TW, Cable J, Chadwick EA,
Griffiths S, Jones TH, Larsen S, Merrix FL, Symondson WOC, Thomas RJ, Vaughan IP. (2011). Landscape Connectivity of Freshwater Ecosystems: Strategic Review and Recommendations. CCW Contract Science Report No: 932, 117pp, CCW, Bangor.
Thomas Rh. 2013. CSM Habitat Structure Assessment for the Habitats Directive Second Monitoring Cycle (2007-2012). CCW Internal Note.
Thomas Rh, Hatton-Ellis TW, Garrett H. 2013. Water Quality Assessments for River Special Areas of Conservation: Second Habitats Directive Reporting Round (2007-2012). CCW Staff Science Report No: 12/8/2, Countryside Council for Wales, Bangor.
Vaughan IP, Ormerod SJ. 2012. Large-scale, long-term trends in British river macroinvertebrates. Global Change Biology 18:2184.
Willby, N, Pitt JA, Phillips G. 2009. The ecological classification of UK rivers using aquatic macrophytes. UK Environment Agency Science Reports. Project SC010080/SR.

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	2001-2018		
5.2 Surface area (in km²)	a) Minimum	b) Maximum	c) Best single value 20
5.3 Type of estimate	Best estimate		
5.4 Surface area Method used	Based mainly on extrapolation from a limited amount of data		
5.5 Short-term trend Period	2001-2018		
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	1989-2018		
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 0.6	Maximum 0.72
	b) Area in not-good condition (km²)	Minimum 14.25	Maximum 17.1
	c) Area where condition is not known (km²)	Minimum 2.18	Maximum 5.15
6.2 Condition of habitat Method used	Based mainly on extrapolation from a limited amount of data		

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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	

7. Main pressures and threats

7.1 Characterisation of pressures/threats

Pressure	Ranking
Physical alteration of water bodies (K05)	H
Modification of hydrological flow (K04)	H
Mixed source pollution to surface and ground waters (limnic and terrestrial) (J01)	H
Abstraction from groundwater, surface water or mixed water (K01)	H
Invasive alien species of Union concern (I01)	H
Temperature changes (e.g. rise of temperature & extremes) due to climate change (N01)	M
Development and operation of dams (K03)	M
Agricultural activities generating soil pollution (A29)	M
Droughts and decreases in precipitation due to climate change (N02)	M
Modification of flooding regimes, flood protection for residential or recreational development (F28)	M

Threat	Ranking
Physical alteration of water bodies (K05)	H
Modification of hydrological flow (K04)	H
Mixed source pollution to surface and ground waters (limnic and terrestrial) (J01)	H
Abstraction from groundwater, surface water or mixed water (K01)	H
Invasive alien species of Union concern (I01)	H
Temperature changes (e.g. rise of temperature & extremes) due to climate change (N01)	M
Development and operation of dams (K03)	M
Agricultural activities generating soil pollution (A29)	M
Droughts and decreases in precipitation due to climate change (N02)	M
Modification of flooding regimes, flood protection for residential or recreational development (F28)	M

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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		Medium-term results (within the next two reporting periods, 2019-2030)

8.5 List of main conservation measures

Restore habitats impacted by multi-purpose hydrological changes (CJ03)
Other measures related to mixed source pollution and multi-purpose human-induced changes in hydraulic conditions (CJ04)
Reduce diffuse pollution to surface or ground waters from agricultural activities (CA11)
Reduce/eliminate diffuse pollution to surface or ground waters from industrial, commercial, residential and recreational areas and activities (CF05)
Manage water abstraction for public supply and for industrial and commercial use (CF11)
Management, control or eradication of established invasive alien species of Union concern (CI02)
Reduce impact of hydropower operation and infrastructure (CC04)
Adopt climate change mitigation measures (CN01)
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

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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: 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 15 b) Maximum 18 c) Best single value 16.5
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	Unknown (x)
11.5 Short-term trend of habitat area in good condition within network Method used	Insufficient or no data available
11.6 Additional information	

12. Complementary information

12.1 Justification of % thresholds for trends	
12.2 Other relevant information	

Distribution Map

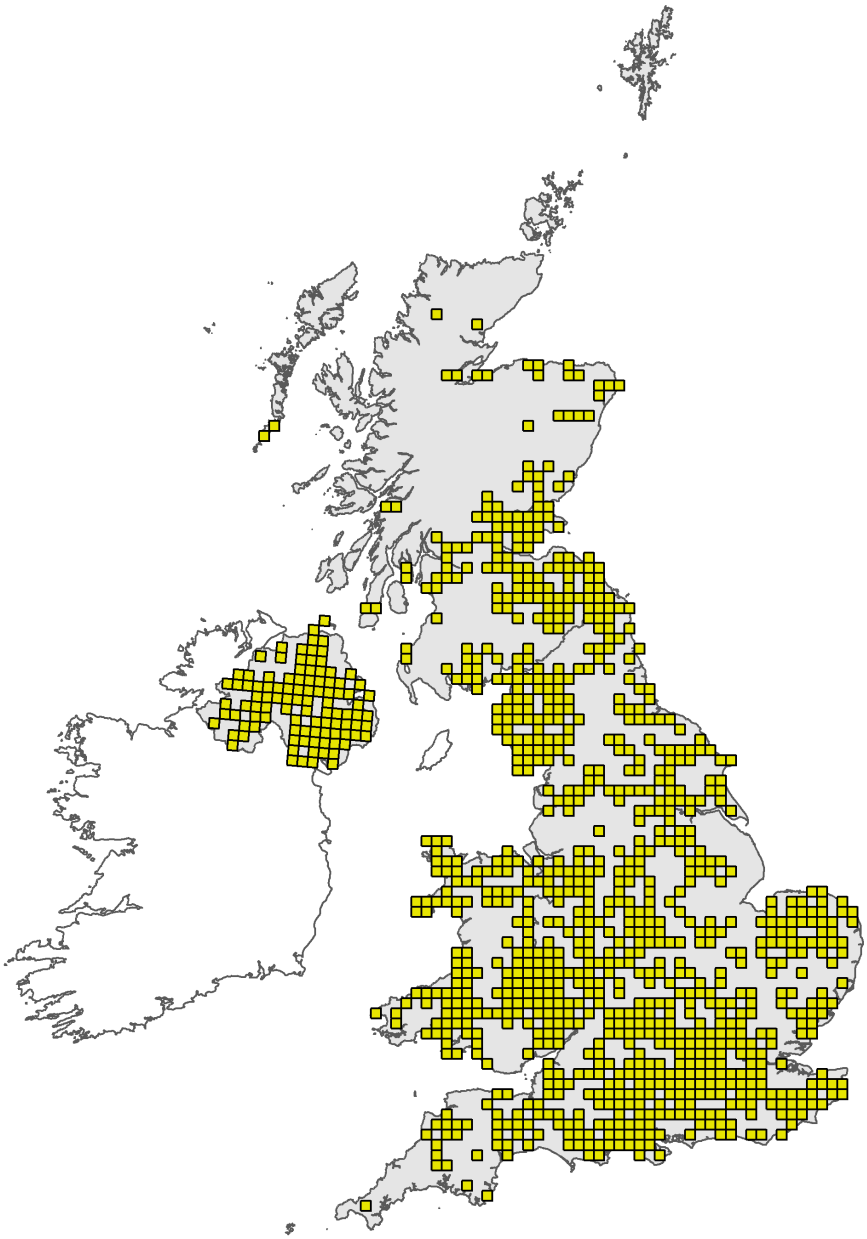

Figure 1: UK distribution map for H3260 - Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation. Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government 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
2.3 Distribution map; Method used	There is no new information about the distribution of H3620 therefore the 10km distribution map from the 2013 reporting for H3620 is used here (NRW, 2013).

Habitat code: 3260 Region code: ATL

Field label	Note
4.11 Change and reason for change in surface area of range	There is no new information about the distribution of H3620 therefore the 10km distribution map from the 2013 reporting (NRW, 2013) and the accompanying range surface area is used here.
5.2 Surface area	There is no new information about the area covered by H3620 therefore the area estimate from the 2013 reporting for H3620 and the accompanying rationale is used here (NRW, 2013). No area data are available for this habitat (JNCC 2007), nor is a standard method available for measuring it. Moreover, on the whole river habitat is not destroyed, apart from when rivers are straightened and therefore shortened (JNCC 2007). Rivers are dynamic systems and most methods for monitoring them focus on biological communities and on measuring processes, rather than on habitat extent. The value reported represents a combination of data extracted from GIS with a correction factor based on expert judgment. See 5.4 for more information. Due to the topology of river networks, river length is a more appropriate measure and is much more widely used in the scientific literature. Data from EA (unpublished) indicates that there are 6892km of river in Wales that could potentially support this habitat. 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.
5.4 Surface area; Method used	There is no new information about the area covered by H3620 therefore the area estimate from the 2013 reporting for H3620 and the accompanying rationale is used here (NRW, 2013). We took the total area of running water in Wales as measured by the Phase I habitat survey, and excised upland areas (where this habitat does not usually occur) and brackish water using GIS. This gave a total area just under 60km2. However, H3260 occurs only patchily in many Welsh rivers due to the presence of unstable sediments that are unsuitable for the development of macrophyte beds. We therefore applied a correction factor of 0.33 to allow for the fact that 66% of the length of lowland rivers may be geomorphologically unsuitable to support substantial macrophyte beds. There is great uncertainty around this figure, however and the true value may be as much as double or as little as half of the figure reported.
5.6 Short term trend; Direction	Inadequate data are available within Wales to make an assessment of trend in area for this habitat type. In particular, very little new data has been collected since 2006. No accurate data on trends are available. However, very little, if any channelisation or rehabilitation work has occurred in Wales since 2001 and it is therefore highly unlikely that there has been a detectable change in area of this habitat.
5.8 Short term trend; Method used	No quantitative data are available and thus no new formal analysis could be carried out.
5.9 Long term trend; Period	No accurate data on trends are available. However, very little channelisation or physical rehabilitation work (as distinct from soft engineering, coppicing etc) has occurred in Wales since 1988 and it is therefore highly unlikely that there has been a detectable change in area of this habitat.
5.10 Long term trend; Direction	No data on long term trend in area are available. See 5.9

5.11 Long term trend; Magnitude	No data on long term trend in area are available. See 5.9

6.1 Condition of habitat

For reporting purposes it was necessary to submit only area data on structure and function rather than length. As a result area values were derived from the length/condition figures as detailed in the 6.1 narrative and the estimates for total habitat area. The SAC condition data were used and the percentage river length in each category multiplied by the total habitat area within the SAC network (reported as between 15 and 18km2) this provides the following figures: - Area in good condition - min 0.6 km2 ; max = 0.72 km2. - Area in not good condition - min 14.25 km2; max 17.10 km2 - The remaining area of 2-5km2 outside the SACs and the 0.15-0.18 km2 within the SAC but of unknown condition fall into the category of condition unknow = 2.18- 5.15 km2. Narrative: 1. Analysis of SAC monitoring data for river waterbodies in SAC rivers: Area in good condition: 6 waterbodies (4% of total number) Area not in good condition:135 waterbodies (95% of total number) Area where condition is not known: 2 water bodies (1% of total number) 2. Analysis of WFD classification data for all river waterbodies (inside and outside of SAC rivers) This analysis uses 2015 classification data for all 717 river waterbodies covering 7149km. The analysis assumes that high ecological status (hes) is equivalent to good condition, good ecological status (ges) is equivalent to unknown condition and less than ges is equivalent to not in good condition. Area in good condition: none Area not in good condition: 4410km (432 river waterbodies, 62% of total length) Area where condition is not known: 2736km (285 river waterbodies, 38% of total length) These assessments are based on relative proportions of the habitat resource in different levels of condition. It has not been possible to generate estimates of total habitat area in good condition because of difficulties in relating WFD ecological status data to data on the condition of SACs as well as the lack of understanding of the headwater stream resource, which makes up a large proportion of total river length in Wales. The judgement of structure and function uses a combination of data from condition assessment of H3620 plus analysis of classification data from the Water Framework Directive (WFD). Assessment of the condition of riverine SACs in Wales 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 143 waterbodies within river SACs are coincident with the SAC management units notified for H3620. Of these there are 6 waterbodies (4%) which are favourable, 135 waterbodies (95%) which are unfavourable and 2 waterbodies where condition is not known. The most recent data for these assessments of these sites dates from 2016. Beyond SACs, 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'. 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 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 ecological status classes. In fact, some attributes of habitat condition used in the assessment of SACs are not directly addressed by ecological status assessment (e.g. impacts on riparian habitat, impacts on physical habitat quality including habitat extent, flow modifications and the presence of non-native species). However, for most biological and environmental indicators that both assessment methods use, favourable condition is most closely associated with high ecological status. Analysis of 2015 WFD ecological classification data for Wales for this Article 17 reporting round provides an indication of the condition of the entire Welsh resource of H3620. Of 717 river waterbodies covering 7149km, none are High Ecological Status (HES) which is equivalent to good condition,

	432 (62% or 4410km) are less than good status which is equivalent to not good condition and 285 (38% or 2736km) are Good Ecological Status (GES) which is unknown condition. 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 Welsh 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. Approximately 13% of all WFD river waterbodies in Wales 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, around 44.5% are currently recorded at ges or better overall (no waterbodies are recorded at hes). 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.
6.2 Condition of habitat; Method used	The H3260 habitat resource is extensive and widespread. Monitoring is only undertaken at discrete points in the resource, and at certain times, and results are extrapolated.
6.3 Short term trend of habitat area in good condition; Period	Condition data on protected sites is not adequate to quantify changes as there have been too few condition assessments of sites and these are based on insufficient data. WFD data provides scope for more quantitative assessment of trends.

7.1 Characterisation of pressures/ threats	Pressures: The key factors affecting the aquatic macrophytes in H3620 (including flow regime, water quality, geomorphology and riverine corridor management) are complex and interlinked (Hatton-Ellis et al 2003). Flow velocity is thought to be the single most important factor in terms of the condition of H3620 but geology, water quality and channel modifications also have a major influence. Important pressures on H3620 in Wales are modification of flow (K04) and abstractions (K01) such as for drinking water. Modification of flow regimes tends to increase the flashiness of rivers, increasing suspended solid loads and levels of scouring which leads to loss of sensitive species. Equally high levels of abstraction leads to lower than natural flows and to loss of species diversity alongside increased silt deposition and nutrient retention. Physical modifications of waterbodies (K05) for a variety of purposes either to improve drainage or flood risk protection (F28) are also key pressures in Wales. Channel modifications (loss of river length, reduced habitat complexity, stabilised water levels and siltation) and in-stream modifications or impoundments (restricting movement of water and some biota) lead to reductions in species diversity of H3620. In severely modified channels the overall plant community is degraded and species poor. Infrastructure associated with pressures already listed also puts pressure on rivers with H3620 in the form of dams (K03) either for hydropower or water abstraction. Impoundments alter the composition of H3620, favouring species that thrive in stable flow depths, low velocities and fine substrates at the expense of species requiring faster flows and coarse substrates. Pollution is also a major pressure on H3620 in Wales, from a variety of sources (J01), including agriculture (A29), forestry (B23) as well as urban (F12). Mixture of point source and diffuse source pollution causes eutrophication, organic pollution, toxic pollution and acidification which can all cause shifts in plant community composition. Enhanced sediment loads is also a widespread problem which interacts negatively with low flows and channel modifications. Other pressures on H3620 are invasive species (I01), with Japanese knotweed (Fallopia japonica) and Himalayan balsam (Impatiens glandulifera) present along river corridors throughout Wales. Climate change is also a pressure, leading to increased water temperatures and extreme rainfall events (N01, N02, N03). Prolonged dry spells lead to temporary lower flows, reductions in wetted area, loss of niche habitats and disconnection with floodplain features. Increased periods of heavy rainfall lead to more frequent flooding, increased scouring of river beds, bank erosion, and 'wash-out' of resident plants and invertebrates. Threats: All of the above pressures are also threats for the future.

8.5 List of main conservation measures	There is a range of conservation measures underway and planned across rivers in Wales which will have a significant positive impact on the mutliple pressures impacting on H3620. The need for river restoration focussing on restoration of natural processes is now widely accepted in Wales and river restoration is a priority in NRW's business plan. NRW has set up a task and finish group for river restoration and are also part of an IUCN project on river restoration and biodiversity. Work is also going on under NRW's Sustainable Fisheries Programme and there is a proposal for a large scale river restoration project across the river Dee which is a cross border SAC in North Wales/England. It is anticipated that these measures will make progress towards restoring natural processes, features and physical habitats (CJ03). The Rivers Trusts in Wales carry out a wide range of river restoration, public engagement and catchment management activities including most of the measures listed above, but especially those related to land use (CA11, BC10), bank erosion (CJ04) and invasive species (CI02). Water abstraction and discharge impacts (CJ03, CF11) have already been reduced and/or constrained via the Review of Consents process. Further work on abstractions is taking place via the Restoring Sustainable Abstractions project which is reviewing long standing issues such as the Ardudwy Leat abstraction from the Afon Eden in North West Wales. It is hoped that measures in river catchments such as Glastir will help manage agricultural (CA11), forestry (BC10) and other (CJ04, CF05) impacts and thereby help river water quality to recover. Where rivers are designated as protected sites, management agreements are also used to control agricultural inputs. Catchment based approaches are also being used effectively, such as via WUF's work across the catchments of the Wye and Usk, the work of the Welsh Dee Trust across the Dee catchment and Taclo'r Tywi, an NRW led partnership initiative to improve the water quality and biodiversity of the Tywi catchment. Further support for catchment-based approaches across Wales is required to continue to address the multiple factors impacting on H3620. Invasive species are a significant concern and whilst relatively easy to detect and treat, measures to control them (CI02) are of limited effectiveness unless a catchment wide stratgey is used as the Dee Invasive Species project have demonstrated. Further work is needed to develop and implement effective catchment-based control of invasive species. Identification of suitable climate change mitigation and adaptation measures (CN01, CN02) are highly site-specific, but an effective measure is increasing tree cover in riverine corridors creating shade and reducing the temperature of water. General morphological restoration also helps increase resilience to climate change by providing a wider range of instream habitats and water depths.
9.1 Future prospects of parameters	9.1a Future prospects of - range There are no reasons to expect a decline or increase in range of H3620 in Wales in the next 12 years. Distribution of this habitat type is dependent on a range of factors including gradient, flow, geology and adjacent land management. It is unlikely that these factors will change enough to lead to a contraction or expansion in range; what is more likely is that the condition of the habitat will change in the foreseable future. 9.1b Future prospects of -area There are no reasons to expect a decline in area of this habitat in Wales in the foreseeable future. Also whilst restoration of natural river length is being achieved at some sites through restoration of natural riverine processes (particularly in river SACs), it is unlikely that this will be widespread across the river network. 9.1c Future prospects of -structure and function There is some prospect of restoration of natural water quality, hydrology and morphology in SAC rivers as well as other rivers prioritised for salmon. This is through external funding and internal work programmes such as the Sustainable Fisheries Programme. However, any improvements due to conservation measures need to be set against increases in pressures from climate change and population growth/development as well as ongoing unauthorised works on rivers.

11.1 Surface area of the habitat type inside the pSCIs, SCIs and SACs network	There is a reasonably good understanding of the extent and distribution of this habitat within the SAC network as a result of monitoring data. The maximum value includes areas of marginal habitat quality and/or locations where we are uncertain of the presence of this habitat type. It should be noted that the habitat type is viewed here as being a whole river reach scale habitat, rather than as a mesohabitat type corresponding to (for example) Ranunculus beds. This is in line with the approach previously taken by the UK Conservation Agencies in river classification and monitoring (see Holmes et al. 1999; Hatton-Ellis et al. 2003; JNCC 2005). If only mesohabitat was considered, the habitat extent would be much smaller.
11.3 Surface area of the habitat type inside the network; Method used	There is no new information about the distribution of H3620 either inside or outside of SACs and therefore the 10km distribution map from the 2013 reporting for H3620 and the accompanying rationale is used here (NRW, 2013). The extent within the N2K series was estimated by overlaying a GIS layer of SAC boundaries onto the running waters map of the CCW Phase I habitats dataset. Watercourses inside SACs not designated for Ranunculion habitat were removed. The dataset was quality assured to ensure that the river network was continuous and corresponded with site boundaries (mismatches sometimes occurred due to mapping at different spatial scales, or due to river activity). The polygon area was then summed to estimate a total area for Wales.
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.
11.5 Short term trend of habitat area in good condition within the network; Method used	Condition data on protected sites is not adequate to quantify changes - there have been too few recent condition assessments of sites.