

Title: Stakeholder Review – comments and responses: Biological standards	Paper Number: FTT034
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Purpose: The paper presents the UKTAG’s responses to the comments received during the consultation on the biological standards.	

Responses to questions

This short report provides responses from UKTAG to questions raised by stakeholders to the 2013 Biological Standards consultation.

The questions posed in the consultation are outlined below:

1. Whether or not you agree that our proposals provide for a better understanding of the ecological quality of the water environment?
2. How the recommendations of TAG might be further improved in the future?

Unlike the concurrent consultation on P standards, few of the responses attempted to answer the specific questions that were posed by UKTAG, with most preferring to focus on a few particular issues.

Table 1 Responses to the UKTAG Biological Standards Consultation were received from the following organisations.

SW Water	SNH
Anglian Water	CCW
QMC	Natural England
United Utilities	Wildlife and Countryside Link
Welsh Water	James Hutton Institute

An Overview of Comments

The changes to the methods were generally welcomed by those who responded, with most comments relating to how assessment methods would be applied rather than questioning their validity. Respondents recognised that the agencies had learnt many lessons through using the assessment methods over the past few years, and also that the revised methods have been intercalibrated with similar methods used elsewhere in Europe.

Concerns were expressed about the resource implications of the revised monitoring programmes. UK TAG emphasises that the intention of all the revisions is to provide a better understanding of ecological status both nationally and with respect to individual catchments. This should lead to better targeting of measures and, therefore, more efficient investment of public and private money. The revised methods should not require a significant change in the amount of resource required to collect data and the agencies already have training and quality assurance programs to ensure consistency in their use.

One respondent disagreed that our proposals provide for a better understanding of the ecological quality of the water environment, commenting that unless better tools are provided to the UK TAG, little is likely to change. We disagree with this statement. The inter-calibration exercise gave UK TAG members ample opportunity to compare our approaches with those of other countries and we are satisfied that the methods used in the UK are at least technically equivalent to methods used elsewhere in Europe for assessment and classification. UK assessment methods also comply with the requirements laid out in the WFD’s normative definitions. Critiques of the limitations of individual methods for assessing situations where multiple stressors are acting on an ecosystem need to be set into context as, in practice, several trophic levels will be assessed simultaneously through the application of different tools methods in the WFD surveillance network. Our ecologists will be able to examine differences between responses of groups alongside analyses of chemical and other evidence, in order to unravel the pressures acting on particular water bodies. We recognise that, in some situations, additional analyses may be required to diagnose particular problems, and to satisfy ourselves that there is a cause and effect relationship between a pressure and the biota within a water body. However, such analyses will supplement, not replace, our assessment tools.

Few respondents answered the second question directly. The conservation agencies drew our attention to deficiencies in the current tools for assessing the entire “river habitat” (as distinct from the channel and banks), which has implications for assessments of favourable condition. They also drew our attention to deficiencies in some assessment methods with respect to assessment of the entire life cycle of some protected species (e.g. Atlantic salmon, river lamprey, freshwater pearl mussel). We are working with the conservation agencies to secure alignment between WFD and conservation objectives where this is achievable and will bear their points in mind.

General Comments

Comment	Response
<p>Anglian Water Impact of changes of methods on 2009 baseline not fully assessed.</p>	<p>The comparative performance of the current and proposed methods presented in the consultation document was assessed using the 2011 classification data as this is the most recent data on water-body status held by the UK environment agencies.</p>
<p>Anglian Water Resource implications of revised monitoring programmes needs to be considered.</p>	<p>It is essential that the best information is used to underpin environmental classification and regulation and UKTAG believes that application of these methods will contribute to this. That said the UK environment agencies face constant issues in resourcing their monitoring programmes. Where increased resources are</p>

	<p>associated with the application of the new methods this will be addressed through improved prioritisation ensuring that monitoring is targeted at the most challenging areas.</p>
<p>Anglian Water We would question how representative recent data sets collected during extreme climatic events are if they have been used. Concerns have also been previously expressed about whether the biology dataset is statistically comprehensive enough to make conclusions from.</p>	<p>The data sets that have been compiled to develop WFD methods have reasonable temporal and spatial components, thus UKTAG believes that the methods developed from them are suitable for current application across the UK.</p> <p>ECOSTAT- an EU committee with responsibility for WFD implementation has started to consider how future climate change scenarios might be considered under the WFD. As it is generally believed the WFD is not an appropriate method for managing climate change, one possibility is that WFD methods may see a re-setting of reference conditions to take account of climate change impacts on the water environment. Thinking on this issue is at an early stage and much work needs to be undertaken.</p>
<p>Anglian Water Regulatory Impact Assessment required.</p>	<p>Impacts arising from the proposed changes will be undertaken where necessary by the UK environment agencies.</p>
<p>Anglian Water Implications of methods in these annexes needs to be considered:</p> <ul style="list-style-type: none"> • Resource implications of identification to species level • Ease of access and availability of representative sites • Quality control of sampling techniques and species identification • Accreditation of consultants to ensure sufficient data quality 	<p>Many of the biological methods used by the UK environment agencies already require species level identification, and where improvements now require a greater level of taxonomic resolution this will need to be addressed by the agencies prioritising sampling activities. The issue of representative sites is a key issue and the UK environment agencies take a range of approaches to ensure that biological samples obtained from a water-body are generally representative of the conditions in it. The UK environment agencies operate training programmes to support the implementation of these methods, and all aspects of their application are underpinned by quality assurance procedures.</p> <p>Where common methods are applied across the UK their consistent application is overseen by a series of BQE Steering Groups</p> <p>Similar specific issues are identified in the Macrophyte and Phytobenthos Section below.</p>

Scottish Natural Heritage & Natural England

SNH and NE raised a series of similar issues relating to the links between the methods they have developed for assessing the condition of sites designated for their nature conservation interests, and those the environment agencies have developed for WFD Assessments. The responses from both agencies are set out below, but the key issues relate to:

- **The scale of application:** For designated sites, the 'river habitat' feature is defined as the whole channel and its banks (including hydrologically connected floodplain habitat) and thus are typically larger than river water-bodies (that are usually limited to the channel and immediate riparian zone).
- **Target species:** For some designated sites, the conservation agencies need to assess the condition of a single species and the WFD assessment methodology may not have suitable metrics to allow these single species features condition to be fully assessed.
- **Thresholds for acceptable change:** In some cases designated features may require a greater level of protection than the default WFD objectives. This specific issue is the subject of ongoing discussions between UKTAG and UK Administrations.

SNH

So far there has only been limited work on possible alignment between the biological methods used in determining standards for WFD and the biological attributes in JNCC common standards monitoring.

We would like to emphasise a number of reasons why there may be a difference between the application of biological standards in SACs and SSSIs, and those used for water bodies under the WFD.

1. The scale of the river habitat designation in the River Tweed SAC and a number of SSSIs is likely to be greater than that considered by a water-body. The 'river habitat' feature (SAC or SSSI) is defined as the whole of the river channel and its banks, as an example of natural 'river type'. This includes all biotopes (including ephemeral and perennial biotopes) and the whole characteristic community of the river as

UKTAG recognises that there is much common ground in the development programmes that have been taken forward to support WFD implementation, and nature conservation assessments. However, there are significant differences between them and this will introduce limitations on the synergies that are possible between the work-streams. Recognising these issues the UK environment agencies will continue to work with the UK conservation agencies as partners on these methods under the UKTAG umbrella.

an example of type. Counter to this, in SACs and SSSIs that are designated for particular species (e.g. river lamprey, freshwater pearl mussel, Atlantic salmon), there may be no WFD biological metrics that can directly understand the ecological status of those features or all their life history types (see below).

2. The thresholds for acceptable change for biological metrics may not be set at a level which is will protect the structure and function necessary to maintain the integrity of a designated site. There could be a number of reasons for this. The WFD takes a risk based approach to protecting ecological function, which has necessarily led to the development of metrics that show the extent of pressures acting upon the biology of water-bodies or supporting elements. But to ensure the conservation of SACs and SSSIs, more information is required, particularly that the qualifying feature is present and functioning satisfactorily. While WFD metrics could be used to provide some of this information, by necessity different metrics have been developed for the monitoring of designated sites.

Related to the above point, for riverine habitat in SACs and SSSIs, where the relationship between WFD biological metrics and compositional change in the biota (macroinvertebrate ASPT and diatom TDI) has been analysed, the values for the boundary between good and moderate ecological status have been judged by the conservation agencies to be insufficient for favourable condition. In this case the values for the boundary between high and good ecological status have been judged to be more appropriate. For example, the good/moderate boundary for ASPT was found by UKTAG analysis to equate to an average loss of 4.6 BMWP 'families', and 1 major taxonomic order (e.g. stoneflies).

Natrual England

There are a number of reasons why adoption of biological standards for designated sites may differ from that for water bodies generally under WFD:

- The extent or scale of the habitat considered under Habitats Directive may be greater than that considered as the water body and so not confined to the narrower definition of water body under WFD. For example, for

designated river SACs and SSSIs the 'river habitat' feature is defined as the whole of the river channel and its banks (including hydrologically connected floodplain habitat), as an example of the natural 'river type'. This includes all biotopes (including ephemeral and perennial biotopes) and the whole characteristic community of the river as an example of type.

- Available biological measures of habitat integrity may fail to address comprehensively the full range of pressures which influence site integrity. The approach under CSM for designated sites addresses the nature of impacts on ecosystem processes and the limitations of individual measures of habitat integrity. For instance, a biological indicator might reflect impacts on the general quality of the habitat at a given location but not to the quality or extent of specific biotopes at that location or within the wider river reach, both of which would be important considerations for favourable condition of SSSI/SAC river habitat.
- Thresholds for biological metrics may not be established at a level which is sufficiently protective of community structure and function necessary to ensure the integrity of designated sites. Biological metrics are selected under WFD in order to provide information on the nature of pressures acting on a water body. In assessing the condition of designated sites selected for their nature conservation interest, a more complete understanding of the status of the composition of characteristic communities and maintenance of their integrity, including functioning of supporting ecosystems, is important.

In those instances where the relationship between WFD biological metrics and compositional change in river biota has been analysed (macro -invertebrate ASPT and diatom TDI) the values for good ecological status have been judged by the conservation agencies to be insufficient to protect favourable condition of rivers designated SSSI or SAC for their river habitat. In contrast, the values for high ecological status have been judged to be more compatible with favourable condition. For example, the good/moderate boundary for ASPT

<p>was found by a 2008 UKTAG analysis (referenced in Mainstone 2010c) to equate to an average loss of 4.6 BMWP 'families', and 1 major taxonomic order (e.g. stoneflies). However, the situation across habitat/waterbody types is far from simple - in lakes, there is generally a closer linkage between favourable condition targets (environmental and biological) and standards for good ecological status, since the latter are set at a more protective level. (Natural England</p>	
<p>James Hutton Institute Unless better tools are provided to the UK TAG, little is likely to change. What the UKTAG team need to realise however is that this is not by 'improving' the current tools that we will succeed. Radical changes are necessary, not just in Britain, but in Europe.</p>	<p>The UK environment agencies have successfully Inter-calibrated their freshwater biological assessment procedures and through this process we have concluded that they comply with Water Framework Directive requirements, and that they are at least equivalent to methods used by EU member states. The Inter-calibration process is outlined in a recent peer reviewed paper Birks et al 2013¹. UKTAG recognises that there will be opportunities to improve these methods as scientific advances occur, and that the diagnosis of water-body pressures may require further assessments and it looks forward to working with the research community on these issues in the future.</p> <p>¹Birks S, Wilby, N.J, Kelly M.G, Bonne, W, Borja A, Poikane S, van de Bund, W 2013; Science of the Total Environment 454-455 490-499. Inter-calibrating classifications of ecological status: Europe's quest for common management objectives for aquatic ecosystems.</p>
<p>CCW</p> <p>We note that failure to meet GES is often due to biological failures. With this in mind, we strongly recommend that all the environment agencies extend their biological monitoring networks to provide greater confidence in the assessments and broaden and deepen the evidence base.</p>	<p>The WFD requires water-body status to be assessed using a range of biological and supporting features as this approach provides a more integrated view of environmental condition. The UK environment agencies are fully supportive of this approach; however, there are resource constraints on sampling and it is necessary to direct sampling towards areas where environmental improvement is required, or where there are most questions over status.</p> <p>In some aspects of WFD implementation the scientific understanding behind the pressure/response relationships is immature, and in these instances assessments are made using environmental standards which have been based on expert judgement. Through development programmes UKTAG are progressively developing indicators of ecological</p>

	status, and hope in the medium term to develop fully compliant WFD classification methods to describe these pressures.
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Comment on specific methods

River- Phytobenthos& Macrophytes

Macrophytes & Phytobenthos	
Comment	Response
<p>Wildlife and Countryside Link More generally, we also note that where work to reduce mismatch in the standards involves <i>removing</i> parameters, there is the risk that potentially relevant information is being screened out. For example, in order to improve the relationship between the Macrophyte standard and Phosphorus, one of the metrics previously used to generate the Macrophyte standard has been dropped. The dropped index was a hydraulic measure based on substrate, depth and stream energy – this kind of information may be useful when looking at wider interactions. The proposal that it will be built back in for the third round of River Basin Management Plans suggests that it is recognised as being of importance. We are therefore concerned that its temporary exclusion could lead to important information being lost from the system at least in the interim.</p>	<p>Successful Inter-calibration necessitated exclusion of hydro-morphology metric in LEAFPACS, as most other members states methods were established to describe the relationship macrophytes and nutrients. UKTAG is committed to developing a series of fully compliant WFD classification methods which will include those that are sensitive to hydrological and morphological pressures, an area that is generally recognised as being one of the most challenging aspects of WFD implementation. In the current consultation a series of ecological indicators for these pressures are proposed as an interim solution to this gap in our current capabilities.</p>
<p>CCW The summary text describing the proportion of water bodies passing for macrophytes (section 3.1) does not correspond with the text in the summary for rivers (section 2.1). The major changes actually seem to be related to phytobenthos.</p>	<p>The major changes do relate to phytobenthos, the element is a combination of macrophytes and phytobenthos.</p>
<p>Anglian Water We would however question the use of diatoms in isolation as an indicator of trophic status; other algal species could be considered together with use of relevant measures such as silica as it is a vital building block in diatom communities. An assessment of the physical habitat should be</p>	<p>Analysis during development of the revised LEAFPACS and Diatom methods identified that macrophytes and diatoms showed different sensitivities along the productivity gradient. In low productivity waters diatoms show the greatest sensitivity to pressures, in moderately productive waters both diatoms and macrophytes have a role in describing pressures, and</p>

<p>made and considered when interpreting results and indices used to arrive at class stats for macrophyte and phytobenthos communities</p>	<p>in productive waters macrophytes on their own provide the strongest signal to nutrient pressures. This differential response along the productivity gradient has been used to establish sampling guidance for macrophytes and diatoms in UK rivers. Thus diatoms should only be used on their own in low productivity waters where macrophyte diversity and abundance is generally limited.</p> <p>Analysis in a previous development project concluded that diatoms were a reasonable surrogate for the wider phyobenthos community, and it is for this reason that UK phytobenthos development work has focused on diatoms. That said some of the macro-algae are part of the LEAFPACs procedure. Thus UKTAG believes that it takes an effective approach describing the impact of nutrient pressures on river biota.</p>
<p>Anglian Water Phytobenthos and macrophyte population structure should be assessed alongside a measure of habitat suitability and availability.</p>	<p>This issue will be considered in future development programmes to determine if it would enhance quality of assessments made using the diatom method. Additionally UKTAG has established the development of hydr-morphology pressure classification procedures as key priority for delivery ahead of River Basin Plan 3.</p>
<p>Anglian Water The following implications of methodologies in these annexes need to be considered:</p> <ul style="list-style-type: none"> • Resource implications of identification to species level (availability of suitably trained staff) • Ease of access to and availability of representative sites • Quality control of sampling techniques and species identification • Accreditation of consultants to ensure sufficient data quality. <p>Interpretation of outputs from sampling techniques needs to be approached with caution and consideration given to the primary function of the waterbody. For example reservoirs artificially created for potable storage rather than the optimisation of habitats for wildlife; draw-down of reservoirs would jeopardise environmental optimisation especially of rooted macrophytes.</p>	<p>River macrophyte survey training already covers identification to species level and allows for collection of voucher specimens to be sent on for expert identification where identification by surveyors is uncertain. The issue of representative sites is under review but there is usually boat access where land access is difficult. River sampling techniques and species identification are subjects of an ongoing training program. Where consultants are used for lake macrophyte surveys they are highly skilled professionals with many years experience.</p> <p>As Ecological Status assessment is a pre-requisite of HMWB designation, and this could involve macrophyte assessments and the use of other techniques. Thereafter Ecological Potential assessments take full account of legitimate use.</p>
<p>Welsh Water We also wonder whether Natural Resources Wales will have sufficient staff with the requisite skill-sets to apply the very specialised techniques that underpin the macrophyte and phytobenthos</p>	<p>The skill sets underpinning the macrophyte and phytobenthos tools are no more specialised than those underpinning other tools, simply surveying and identifying species. It is hoped that Natural Resources Wales will continue to employ staff that have carried</p>

standards for example.	out this work in previous years. Where resource shortfalls are identified interim arrangements will be made to support analysis.
<p>United Utilities</p> <p>More investigations are definitely needed where the biology doesn't stack up with the levels of Phosphorus to avoid abortive investment aimed at Phosphorus removal.</p>	<p>Investigations are ongoing and UK Agencies are working in partnership with Water Companies to investigate biology and phosphorus relationships. Expensive investments will only be taken forward where there is clear evidence of eutrophication arising from nutrient pressures.</p>
<p>Energy UK</p> <p>Complete datasets should be sought to progress decision-making, particularly where the existing data suggests that measures may be needed in the second cycle of RBMPs.</p>	<p>As indicated in response to the question above expensive works are only requested when there is clear evidence that a pressure is degrading water-body quality.</p>
<p>Welsh Water</p> <p>For example, and as UKTAG's consultation paper acknowledges, there are still considerable uncertainties and noise in the data. Many factors such as shade, river flow, river bed composition, grazing and the effects of other plant nutrients, or the presence of other pressures could all influence the biological response to phosphorus.</p>	<p>We recognise that other pressures could influence the biological response to phosphorus and that there is noise in data. The use of phytobenthos has been designed to detect the impact of nutrient enrichment (P), but ongoing work is attempting to tease out the significance of the additional variables.</p>
<p>Wildlife and Countryside Link</p> <p>Critical to the effective implementation of the WFD is the correct description of reference conditions. We are concerned to find that the England and Wales samples have not been subject to this procedure due to lack of resources. This work should be completed in England before the new standards are adopted.</p>	<p>An understanding of the biota at reference condition is central to the development of a WFD compliant monitoring tool. Through an agreed and published Inter-calibration process applied across Europe, pressure criteria were selected for the identification of reference sites across the UK. In the absence of long-term data, reference conditions were derived using a number of methods including spatial state schemes, expert judgement, palaeolimnology, and modelling approaches. A combination of these methods was employed in order to identify a set of reference sites for use across a number of WFD projects. The main criteria were an absence of anthropogenic influences, defined by the absence of point source inputs, 10% non-natural land use and < 10 inhabitants per km². In the present work a supplementary biological screening was also undertaken of all putative reference sites (based on biotic criteria) to ensure that sites with abnormally low numbers of species, high overall cover, high algal cover, or established populations of invasive species were excluded. This deals with the problem that reference sites were influenced by pressures that were not adequately addressed through the formal screening, or survey data was atypical of the biota normally observed. Biology and phosphorus was</p>

	<p>initially modelled only using those sites that passed screening criteria. This model was then extrapolated to determine the expected values for sites lying beyond the envelope of conditions covered by the population of screened reference sites. The position of additional candidate but unscreened reference sites, such as those in E & W, was then compared with their expected position based on the extrapolated model. Since these sites were found to fall within the error of the existing model they were included as reference sites. In practice by themselves such sites have little influence on the model -they merely confirm that extrapolation within sensible limits generates values that are observable in practice. Moreover the biology at these sites was consistent with that observed in the base of sediment cores from high alkalinity shallow lakes. UK bio-assessment methods for rivers would also have failed to inter calibrate with those of the rest of Europe if our reference conditions were too lax.</p>
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River – Invertebrates

Comments	Response
<p>Anglian Water The role of habitat needs to be looked at more specifically ...</p> <p>CCW In our view, there is a potentially serious gap in the standards due to the absence of an effective tool for assessing the impact of silt on river communities. We note the recent development of the PSI and would recommend that UKTAG consider taking take this index forward as a matter of priority, with the intention of incorporating it into the RICT tool.</p>	<p>The relationships of invertebrates to habitat, flow, and silt are a priority for the BQE group and significant progress has been made with incorporating suitable metrics (notably LIFE, PSI and several others) into RICT. There is however some further development work that is required to finalise the transfer of this new metric into the RICT platform. It is anticipated that this will be developed through RBP2, and will be used in formal classification in RBP3. Depending upon the success of the development projects PSI could be used in weight of evidence assessments during RBP2. In the meantime the approach for dealing with suspended solids outlined in the RBP1 Environmental Standards proposals will be retained.</p>
<p>Queen Mary College Detailed comments on bias and uncertainty for all methods</p>	<p>The agencies accept the need to incorporate uncertainty assessments into all tools and this will form a part of development for any new metric. A project is about to be let which will ensure that this capability is developed for the</p>

	new WHPT metric.
<p>Wildlife and Countryside Link</p> <p>... whilst WHPT is an improvement on the present methodology, incorporating as it does some abundance weighting as required for WFD compliance, it is still only a family level resolution biometric rather than species level one; this, despite pollution tolerance scores being available for some species groups. In order for full compliance to be achieved, the species level is essential: different species within families have wide environmental water quality tolerances and thus there is a danger of water bodies being designated “good” based on family levels where key species are absent. In addition, the existing family level method is only really an effective assessment of organic pollution with some application to other pollution types; ideally, a more complete species level methodology should be designed to more effectively incorporate other pollution types. We also note that the method must be made sufficiently backward compatible to ensure that we can trace the trend of improvements without improvement from 1990. It is critical that the outstanding continuity of UK invertebrate biological monitoring is maintained to allow this assessment of the trends since the first effective implementation of RIVPACS-type approaches in 1990.</p>	<p>UK TAG believes that family-level assessment is adequate for many purposes. The intercalibration exercise has demonstrated that UK method compares favourably with methods used elsewhere in Europe (many of which use species-level identification). Any decision to use species-level identification more widely would need to balance the increased sensitivity against greater effort required per sample.</p> <p>While the WHPT index will become the main classification tool metric for extensive monitoring of general degradation, the agencies currently use species level metrics for acidification monitoring. There are currently 60+ metrics in RICT many of which operate at species level and further indices are being developed and implemented which make use of species data. By allocating appropriate scores to species sensitive to a particular form of pollution key species absence will lower the status for any given site.</p> <p>WHPT is currently backwards-compatible with agency data holdings.</p>
<p>SW Water</p> <p>Based on experience and further investigations, man-made influences on pH should be distinguished from natural ones. This will help target investment into resorting natural conditions as quickly as can be justified.</p>	<p>Both LAMM and WFD-AWIC distinguish between natural and anthropogenic acidification by using a humic typology.</p>

Fish

Comments	Response
<p>Anglian Water</p> <p>Also needs to consider pressures from unlicensed fish removal and Avian predation</p>	<p>These issues pose difficulties in interpreting data gathered to develop a lake fish assessment method, and in the subsequent interpretation of results from any monitoring programmes that</p>

<p>Interpretation of outputs needs to consider role of water body ...</p>	<p>the agencies develop. In this respect we look forward to working with partners to understand the management issues on individual lakes prior to using them for this work. However, it is unlikely that data from lakes with fish populations that are heavily influenced by any of these factors would have any role in developing a lake fish method.</p>
<p>United Utilities</p> <p>We have the following comments in the event that the barrier tool will be considered for fish classification in England or Wales. The comments also generally reflect our view of how barriers should be assessed in England and Wales using the existing fish classification methodology.</p> <ul style="list-style-type: none"> • We agree that limited confidence should be given to classifications resulting from the WFD111 method Fish Barrier Tool, and to any other classification method that has not been ‘ground-truthed’. High confidence should only be used where additional electro fishing data support the conclusion that the barrier is preventing migratory species from occurring at sites where they would otherwise be expected. • We agree that monitoring data should be used when determining classifications and considering investment actions should consider this. • We also agree that the barrier tool should only be a risk assessment for lamprey and eel in that classification should only be downgraded for eels or lamprey when the data show these species are absent from where they normally would be present. • We agree that a streamlined approach to using the WFD111 method of barrier 	<p>Fish barrier assessments are primarily provided through application of the FCS2 procedure in England and Wales. However, where no electro-fishing data exists application of the barrier method is being considered.</p> <p>In cases where there is a debate on the extent to which a barrier impedes fish migration, these points are accepted. However, where the magnitude of a barrier is so great that there is no doubt that fish migration is blocked then UK TAG believes that it would not be necessary to survey in these cases. In this respect the method is used to prioritise the field investigation of specific barriers.</p> <p>Agreed</p> <p>Yes this is the intention and we look forward to working with partners who might make this information available.</p> <p>Predicting the passage of eels over barriers is very difficult to achieve, due to the range of</p>

<p>assessment would not apply to eels because of their differing ability to pass barriers, and that a full barrier assessment/ survey should be required to assess all potential eel barriers.</p>	<p>factors that can affect success. For this reason down grades will only be made following a fish survey which demonstrates that eels are absent from locations where they would normally be present.</p>
<p>Welsh Water</p> <p>Turning to the recommendations relating to biology, Dŵr Cymru believes that priority must be given to developing a better, practical (and non fatal) means of assessing fish abundance and species variety in water bodies. The current and proposed methodologies are flawed. For example, current sampling programmes do not acknowledge the differences that can exist between the fish populations in tributaries and the main river stem, so large programmes of measures can be driven by potentially inaccurate fisheries assessments.</p> <p>We have worked closely with relevant regulators in designing our on-going, ambitious programme of investigations into the Wye and Usk rivers. Our work has, for example, demonstrated the limitations of the current methodologies in assessing fish populations and shown the importance of tributaries in terms of providing valuable habitat. It has also highlighted an apparent lack of regular, coordinated monitoring between the three regulators that have an involvement in these catchments. We would be happy to share the lessons we have learnt with UKTAG.</p> <p>We would also like achievement of the WFD fish standard to be combined with the achievement of Favourable Conservation Status under the Habitats Directive for water bodies that are Special Areas of Conservation and where fish is a feature. Applying different standards for the same element – as happens now - is an obvious example of poor regulation. (Hopefully the amalgamation of CCW and EAW into Natural Resources Wales and CCW's new „LIFE" Natura 2000 programme for Wales will help to reduce such mismatches in Wales in the future.)</p>	<p>UKTAG recognises that sampling fish populations in main stems presents a range of significant challenges, thus where expensive action was required corroborating evidence from a range of status indicators would be required if there was question over method performance.</p> <p>UKTAG would certainly welcome the opportunity to learn about these method limitation experiences.</p> <p>The UK conservation agencies are represented on UKTAG and we work closely with them on development issues. There are however, some fundamental differences in the assessments that the different organisations need to undertake. The WFD requires whole fish population assessments to be made, whilst conservation agency assessments tend to focus on a single target species. Elsewhere in this consultation response the conservation agencies outline a range of issues which are likely to prevent full integration of methods. That said some preliminary discussions have been had in how we can streamline our respective assessment methods.</p>

<p>More generally, we question the need for so many measures of compliance. The Directive itself prescribes a number of specific elements, but here in the UK we seem to have opted for additional - and unnecessary - complication. Particularly given the “one out, all out” implementation regime, this serves to maximize the chances of failure.</p>	<p>This issue is recognised by UKTAG which is keen to minimise the use assessment methods, whilst staying compliant with WFD requirements. In some cases where we use more than one metric for a particular biological element it is because they respond to different pressures, and under these circumstances we believe the use of multiple metrics can be defended.</p>
<p>SNH</p> <p>It should be noted that the proposed FCS2 tool does not include an element for classifying the adult population size or for directly addressing the natural, regional variation in salmon abundance. This will likely prevent full integration of the classification of salmonid abundance in rivers in Scotland but we hope our ongoing work will show some comparability between the classifications for WFD and designated site reporting.</p> <p>Work is ongoing to test for alignment between the proposed tool for classifying fish fauna and rivers and the classification system we use for assessing the condition of Atlantic salmon in designated sites. It is hoped this comparative work may show some alignment however it should be noted that the proposed FCS2 tool does not include an element for classifying the adult population size or for directly addressing the natural, regional variation in salmon abundance. This will likely prevent full integration of the classification of salmonid abundance in rivers in Scotland but we hope our ongoing work will show some comparability between the classifications for WFD and designated site reporting.</p> <p>We note that the consultation does not propose methods for assessing (lake) fish status in Scotland or elsewhere in GB. The conservation agencies have successfully developed and applied biological metrics for assessing the status of fish stocks in lochs designated as SSSIs</p>	<p>The UK conservation agencies are represented on UKTAG and we work closely with them on development issues. There are however, some fundamental differences in the assessments that the different organisations need to undertake. The WFD requires whole fish population assessments to be made against reference conditions, whilst conservation agency assessments tend to focus on a single target species. That said some preliminary discussions have been had in how we can streamline our respective assessment methods.</p> <p>In many cases the abundance of adult salmonids in rivers is affected by a range of factors outwith the river e.g. marine mortality which can be affected by a number of pressures. Thus there are questions about using information from this source in WFD assessments where the main objective is to manage pressures in the waters protected by the WFD. The most significant factor affecting adult salmon abundance is high seas marine mortality.</p> <p>The GB environment agencies are exploring the use of non- destructive environmental DNA sampling techniques to assess the status of lake fish populations, if this proves successful, the UK conservation agencies have indicated that they</p>

since 2005 (Bean, 2003a; b), which you may consider using beyond designated sites.	would have considerable interest in using these methods. See also the response about issues arising from whole population assessments versus single target species assessments.
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Rivers and Lakes – Hydromorphological alteration

Comments	Response
<p>Anglian Water</p> <p>Would welcome opportunity to comment upon methods when they become available.</p>	<p>The initial findings from the indicator trials should be available later in the spring, and we would be happy to engage in further stakeholder discussions once the project steering group have reviewed the project outputs.</p>
<p>United Utilities</p> <p>We support the use of the indicators in general because we believe they have the potential to lead to a more consistent and informed classification; something that, from experience, has been lacking in WFD classification relating to water resources pressures. We have the following specific comments, however:</p> <ul style="list-style-type: none"> We understand that the ecological indicators/ sub-sets of indicators are still under development and that this is why there is no information provided in the consultation document describing how the proposed indicators would actually inform classification. Our view is that, until they have been 'ground-truthed,' additional data will be required to support conclusions made using the indicators about ecological impacts of water resource pressures, and that investment actions should consider this. We agree that there are issues associated with the use of subjective terminology. Some of the water resource pressure indicators are also indicators of other pressures, and may be too general, particularly if used on their own and not alongside additional indicators or 	<p>Full details of the possible indicators were described in the UKTAG consultation. We are currently awaiting a report which describes the outcome of the trial that was commissioned in 2012, and if necessary the trial period will be extended into 2013. In terms of their use it is anticipated that they will be used in a weight of evidence basis to confirm the status of the most impacted water-bodies at poor & bad status.</p> <p>This work will be taken forward in consultation with stakeholders.</p>

<p>additional data. However, the opposite is also true: some of the proposed indicators will only apply in very specific circumstances. We note that there is work underway to address these issues and that this work is due to report in March. We hope that it will be possible to consult on the final sub-sets of indicators selected for application in different circumstances and how the indicators/sub-sets of indicators would be used to inform WFD classification.</p>	
<p>CCW</p> <p>High Ecological Status (HES) is in our view an important component of WFD and for river conservation. However, existing morphological tools virtually rule out any water body in England and Wales reaching HES. It should be a priority, therefore, to develop a more ecologically relevant morphological definition of HES to be applied in England & Wales.</p>	<p>UKTAG fully recognises this issue, and there are development programmes being taken forward to address this.</p>

Lake – Phytoplankton

Comments	Response
<p>Anglian Water</p> <p>Consideration should be given to the use of other pigments such as chlorophyll b for estimation of blue green algal blooms.</p>	<p>We acknowledge the potential for the use of algal pigments to determine the relative biomass of different algal groups. In the future the use of instrumentation may be a cost effective assessment method, however at present we do not consider it practical to implement for wider scale monitoring, particularly as via the WFD intercalibration process we are aware that other countries all use chlorophyll a as the main determinant of algal biomass and rely on taxonomic metrics to detect blue green algal blooms. We will however keep this under review and consider a wide range of methods for assessing algal blooms, including satellite imagery and volunteer monitoring.</p>