

# **Classification Framework for Ecological Status/Potential under the Water Environment (WFD) England and Wales Regulations 2017 including considering alternatives.**

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Client Ref: RDE511 (C21370)

Issue number 1

28.05.2024



**UK Centre for  
Ecology & Hydrology**

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# 1. Executive Summary

This report details the opinions expressed by respondents who attended a virtual webinar on 23<sup>rd</sup> May 2024. The aim of the interaction was to review the Classification Framework for Ecological Status/Potential under the Water Environment (WFD) England and Wales Regulations 2017 including considering alternatives.

Participant feedback was captured in a questionnaire, which was created using UKCEH approved software JISC. In total 46 individuals received a personal open email invitation and 23 registered to attend. Seventeen attended the webinar in full, while one had to leave early in the proceedings. In total 18 completed questionnaires were submitted on the day of the webinar. Half of those completing the questionnaire self-identified as being associated with a non-governmental public body (NGO) and nearly a quarter (22%) were affiliated with a water company. Commercial businesses, research institute/universities and government agencies were also represented.

The event was designed in three sections to capture respondents' views on:

## What participants value most highly about English surface water bodies:

- Biodiversity attributes were considered by participants as the most critically important elements requiring protection. Three of the four biodiversity elements listed (i) Invertebrate biodiversity, (ii) Fish biodiversity and (iii) Plant biodiversity were scored as important or critically important by 100% of respondents. The stressors PO<sub>4</sub>, insecticides and ammonia were ranked most important amongst the 23 suggested attributes, although slightly less scored them as critically important compared with the biological attributes.
- In total 84% of respondents recommended not focusing on specific species. The majority of those who provided a rationale for their response recommended a wider than single species focus although some considered there may be occasions when specific species should be the focus.

## Current classification framework

- Respondents listed several aspects they liked about the current WFD including, the holistic approach (39%) and system thinking (28%) employed, while three specifically mentioned the one out all out principle and two commented they liked the ambition of the WFD.
- Respondents mentioned multiple aspects that they did not like about the current WFD classification and its implementation. Themes that respondents disliked included assumptions not based on evidence, current implementation, patchy data, mixing ecological and chemical parameters and lack of statistical rigour.
- Most respondents were interested in the results at multiply scales i.e., the scale of a water body (79%), catchment (68%) and slightly less at the national scale (50%).



- There were slightly more (44%) of respondents who disagree that a failure in one individual element, such as a chemical, should prevent a waterbody being designated as good ecological status compared to 39% who agreed and 17% who were unsure.
- Analysis of the accompanying narrative indicates that many respondents saw advantages with the approach but had misgivings about the practical application.
- While the majority (83%) of respondents reported they had tried to discover which specific element was leading to the failure to reach good status most (73%) found it difficult.
- Overall, 50% of respondents reported that they felt PO4 levels were causing significant damage but regardless of how they felt about PO4 levels respondent mentioned some element of context specificity in relation to PO4 levels.
- Half of the respondents felt that despite fish abundance being stable for 30 years and fish richness increasing that things are still going wrong for the fish population of England, often mentioning anthropogenic barriers to fish movement.

#### Potential alternative monitoring/classification systems

- Respondents scored five aspects of an alternative system:
  - They supported (94%) a system which included reporting improving, stable or deteriorating trends and 56% supported a classification scheme where unbiased biodiversity (representative of that region/location) was the key indicator of success in a waterbody.
  - Most participants (89%) would not support a classification scheme based only on achieving targets for some chemicals and physical elements of concern nor a classification scheme based only on reporting the status of cherished organisms (78%).
  - There was a mixed reaction to the proposal to change the classification scheme to one based only on reporting the status of groups of organisms known to be sensitive to specific pressures (such as PO4 or ammonia).
- There was no clear trend detected on where respondents would focus if they had the task of improving water quality with very many aspects mentioned.

Overall, the webinar resulted in many thoughtful comments and generally the participants did not rate all biology or stressors as being equally critically important. Biodiversity attributes were considered by participants as the most critically important elements requiring protection closely followed by the need to monitor the dangers of insecticides, phosphates content and ammonia. Participants were divided over whether PO4 and fish community structure, currently both major RNAG factors, really were revealing problems.

There was a lot of interest in WFD results presented but some difficulty in identifying the main problem stressors, with many aspects context specific. Regarding options for alternative classification schemes, the greatest support expressed was for one focused on unbiased biodiversity indicators and including trend analysis.

## 2. Background

This report details the feedback from a stakeholder event held on 23<sup>rd</sup> May 2024. The aim was to review the Classification Framework for Ecological Status/Potential under the Water Environment (WFD) England and Wales Regulations 2017 including considering alternatives.

This event was part of a contract with DEFRA which had the following requirements:

- Determine whether the WFD classification framework for ecological status/potential is designed and implemented in the best way to **measure and assess** the ecological health of the water environment.
- Determine whether the WFD framework is suitable to **inform and direct action**, including for the new Catchment Action Plans (CAPs).

The project did not extend into the topic of water and human health. It focused on the ability of the WFD reporting to reveal ecological health, including whether the current monitoring network and classification system is sufficient for the task. In addition, the project was designed to gather and use information in a way that can effectively describe and direct action that could improve ecological health, noting the new opportunity provided by the CAPs and other legislative drivers e.g., Biodiversity Net Gain (BNG).

## 3. Method

A virtual webinar event was held 23 May 2024 utilising Zoom as a communication platform that allows users to connect and share content. The nature of the event was explained in the 'Participant Information Sheet', along with the purposes for which the data would be used (Annex 1). The event was recorded, and the recording is available on request.

The event was designed by all members of the team including representation from DEFRA, in three sections to capture:

1. views on what participants value most highly about English surface water bodies (and wish to protect).
2. views on the current classification framework, and
3. views on potential alternative monitoring/classification systems that might better reflect biodiversity outcomes as well as different evidence-led methods to identify what is limiting improvements.

Participant feedback was captured in a questionnaire, which was created using UKCEH approved software JISC, the online survey tool designed for academic research, education, and public sector organisations. Most of the questions were obligatory (i.e., respondents could not move to the next page without adding some character in the allotted box). They were advised of this fact and the reasons explained (fullness of participants views captured) but also told they could enter NA if they did not wish to answer. The link to the questionnaire was distributed to participants via a link in the Zoom chat at the start of the webinar.

Further opinions have been sought using a snowball approach (Annex 2) whereby the team encouraged respondents to share with peers that might be interested in the topic, i.e., invitees invite others. Only two responses were submitted (Annex 4). This report solely reports the responses of participants received on the 23<sup>rd</sup> of May 2024 (i.e., those who attended the event).

Favourable Ethical Opinion was obtained from the UKCEH Human Research Ethics Committee (HREC0048) for this study.

## 4. Invitees and attendees

The initial invitation was shared through personal contacts of UKCEH and DEFRA staff. For confidentiality reasons only the institute they represented is provided in **Error! Reference source not found.** In total 46 individuals received a personal open email invitation and 23 registered to attend. In total 17 attended the webinar in full, while one had to leave early in the proceedings. In total 18 completed questionnaires were submitted on the day of the webinar and are analysed in this report.

The invitation (Annex 3) detailed the proposed agenda which was not changed at the event.

Table 1. Number of people registered or were invited from various organisations/institutions. One person registered per organization unless otherwise noted in brackets.

Registered	Invited but did not register
Angling Trust	AstraZeneca
Bristol & Avon Catchment partnership	Atkins
James Hutton Institute	Brunel University
Imperial Collage, London	BTO
Joint Nature Conservation Committee (JNCC)	CIWEM
National Farmers Union (NFU)	Durham University
Northumbrian Water Limited (NWL)	Freshwater Biological Association (FBA)
Reckitt Benson	Lancaster University

Royal Society for the Protection of Birds (RSPB)	Leicester University
Severn Trent	National Trust
Syngenta (2)	Ofwat
Thames 21	Oxford University
Thames Rivers Trust	Reading University
Thames Water	Rivers Trust
The Rivers Trust (3)	UK Water Industry Research (UKWIR)
Wessex Water	Unilever
Wildlife Trust	
World Wide Fund for Nature (WWF) (3)	

Half of those completing the questionnaire identified as being associated with a non-governmental public body (NGO) and nearly a quarter (22%) were affiliated with a water company (Fig 1.) Commercial businesses, research institute/universities and government agencies were also represented.

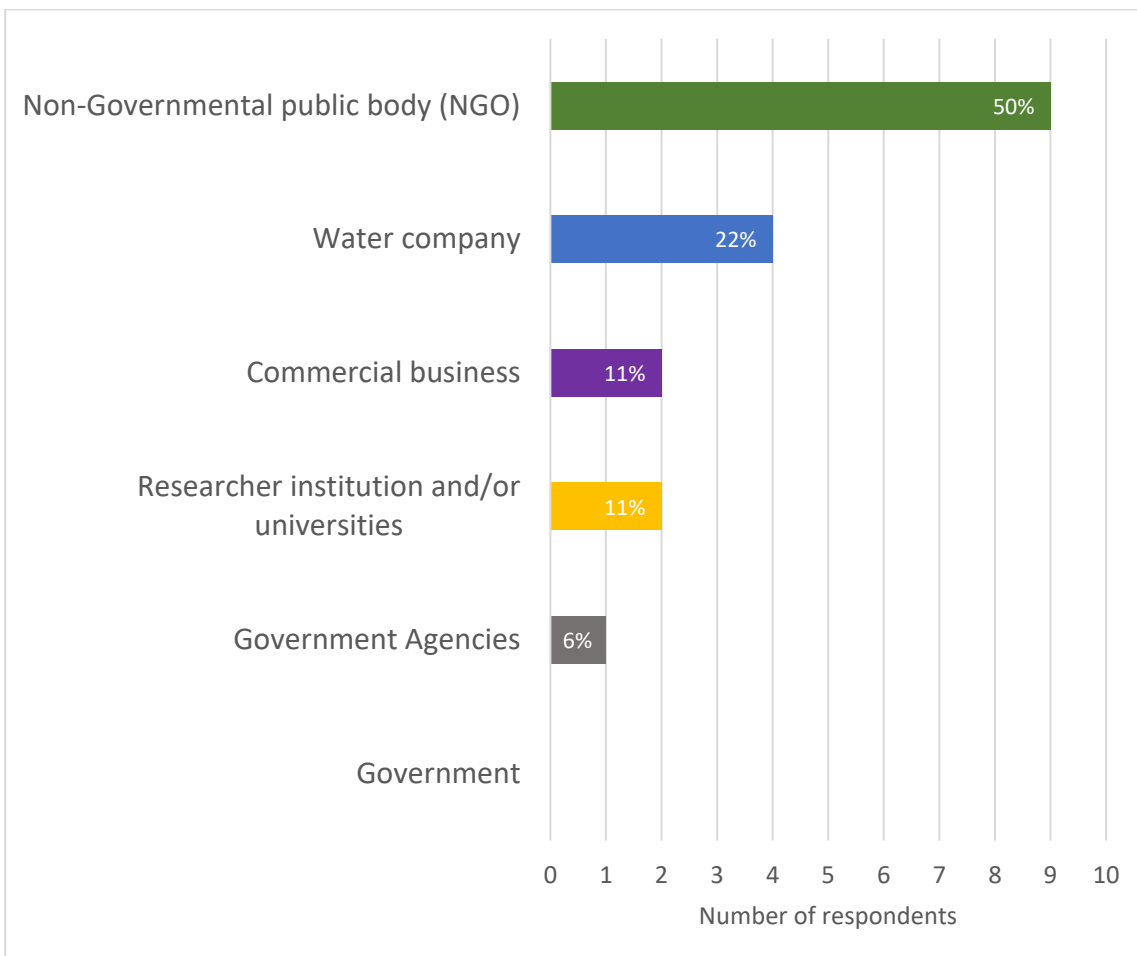


Figure 1. Affiliation of respondent who completed the questionnaire.





## 5. Section 1 - What participants valued

At the start of the event, following brief introductions of attendees, participants were asked first to complete section one of an anonymous questionnaire.

It was explained that there were a series of potential monitoring criteria to rank and two open questions when participants could provide more in-depth views.

### 5.1 Attributes of surface water

The first question was written as: *“You tell us what you value most about our surface waters, including artificial and heavily modified water bodies i.e., which attributes of surface water do you most wish to protect and which chemical elements, at current levels, do you believe represent the biggest dangers, if any, to wildlife? Please click the option which best represents your thinking”*. Twenty-three common attributes were listed, and participants were asked to score each on a four-point scale from critically important to not important.

Biodiversity attributes were considered by participants as the most critically important elements requiring protection. Three of the four biodiversity elements listed (i) Invertebrate biodiversity, (ii) Fish biodiversity and (iii) Plant biodiversity were scored as important or critically important by 100% of respondents. Algal biodiversity and avoiding algal blooms were both scored by 94% of respondents as important or critically important with a single individual recording a neutral score (Fig 2).

Insecticides, phosphate content and ammonia were similarly considered by respondents as important or critically important (94-100% of respondents) although slightly less scored them as critically important compared with the biological attributes. The remaining chemical or physical attributes were scored with reducing importance or respondents were unsure of their importance. All respondents considered ‘General soluble organic pollution’ as a valuable attribute but only 33% marked this attribute as critically important.

Only two people scored any of the items as unimportant and that was the attribute of plastics debris but neither considered microplastics as unimportant. Over three quarters of respondents (78%) scored microplastics as important or critically important. However, as noted later by another respondent to a later question large plastics will generate microplastics eventually which may have been in the minds of respondents when scoring these two attributes.

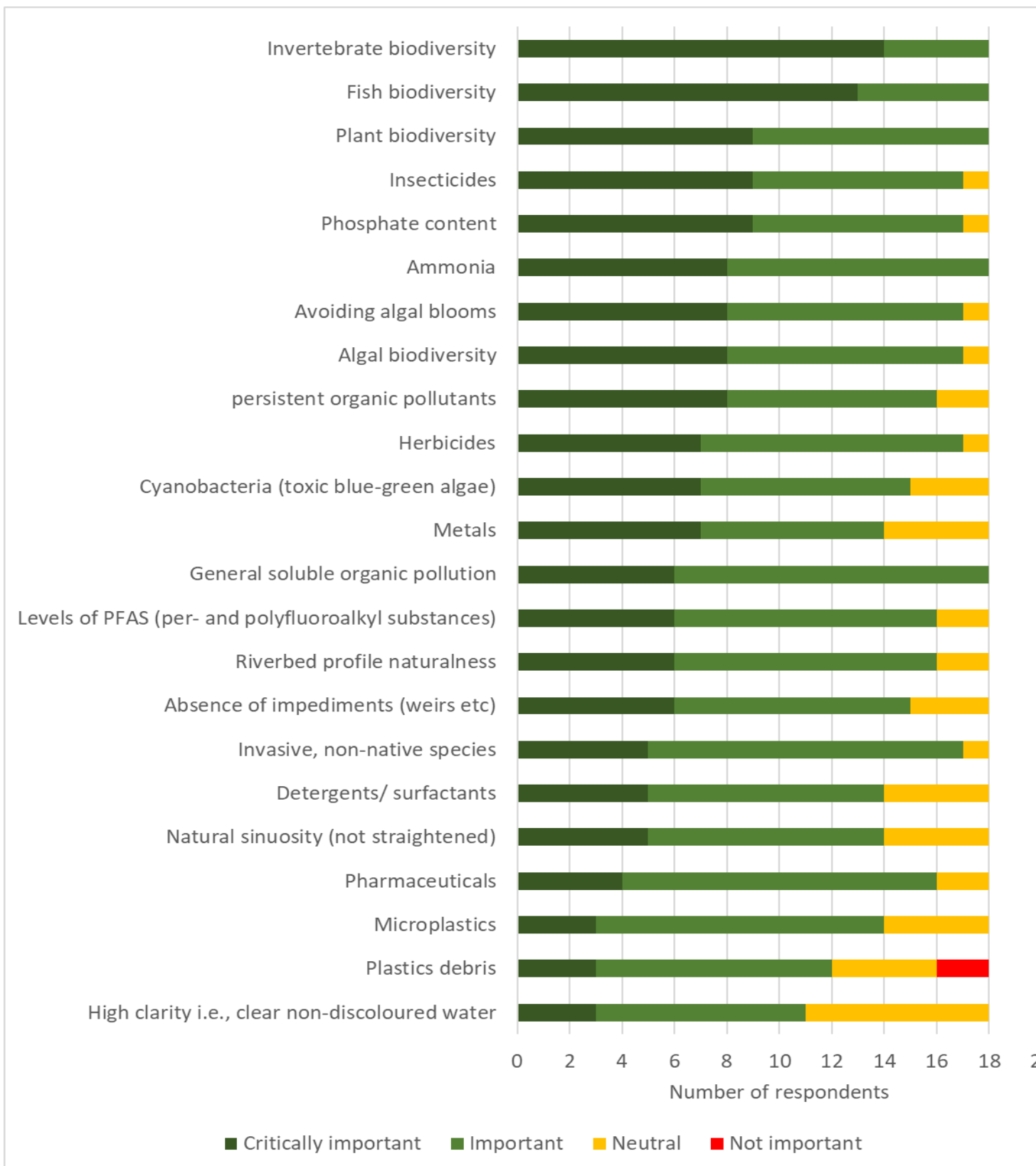


Figure 2. Number of participants assessing selected attributes of surface water on a four-point scale, from critically important to not important.

## 5.2 Specific species

Participants were asked two final open questions in this section. The first question asked Q24 *Do you have a specific species that should be a focus for protection?*

Fifty-six percent of respondents recommended not focusing on specific species and further a 28% were classed as not focusing on specific species (**Error! Reference source not found.**). The majority of those who provided a rationale for their response not to focus on specific species recommended a wider than single species focus e.g. *all species* or *freshwater biodiversity in general*. One individual recommended a specific group of species suggesting aiming *for a diverse macroinvertebrate population*.

Five individuals (28%) considered there were occasions when a focus on specific species or group was useful (**Error! Reference source not found.**) depending on the specific water body e.g. *'The important species and parameters depends entirely on a site by site basis'*, while others linked their recommendation to focus on specific species to laws e.g., *'Environment Act species target (e.g. various inverts, fish, water vole)'* or policy e.g. *annex 2 species or on IUCN red list*.

One respondent did recommend a focus on specific species particularly fish and bird species using aquatic systems commenting *'as they were indicator species for the health of the ecosystem'*.

Two respondents were classed as non-committal as one answered *n/a* while the other focused on a particular source of pollution and did not specifically answer the question.

Table 2 Participants responses to Q24 *Do you have a specific species that should be a focus for protection?*

<b>Recommend not to focus on specific species</b>
No. the objective of WFD should be to drive good biodiversity that would be reflective of natural / near natural conditions. I don't think that the aim should be to favour one species over another (INNS excepted obviously!)
No, all species
no there shouldn't be a focus on a single species it should be across multiple species.
No particular species - freshwater biodiversity in general
No particular species, but aim for a diverse macroinvertebrate population
None
No
no
No
No
<b>Perhaps focus on specific species</b>

Like all the questions. The location of the waterbody is important. The important species and parameters depends entirely on a site by site basis.
I guess there are specific habitat types that could be included in such a list - am thinking of the 'Habs Directive' list; but perhaps more generally 'biodiverse habitats' Obviously where there are dangerously high concentrations of any one of these (or low in the case of the positives) that's more of an issue. Nitrates, organic nitrogen (per Penny Johnnes' work) and total N critically important
Depends on the water body (i.e. different pressures)
Perhaps those listed under the Environment Act species target (e.g. various inverts, fish, water vole) for useful target co-delivery. Potentially beaver for natural process restoration!
I think we should focus more on ecosystem and ecosystem functioning than specific species. If we are looking at specific species then we should use a combination of population trends and level of protection e.g. are they annex 2 species or on IUCN red list (criteria tbc) and local abundance.
<b>Yes focus on particular species</b>
Fish and birds using aquatic systems. If these species are able to thrive it would indicate species lower in the food chain are able to thrive and support the species higher in the food chain, and there is suitable habitat, connectivity and water quality to support these.
<b>Non-committal</b>
Really critical to protect freshwater environments from agricultural runoff as this is such a major cause of nutrient pollution. A critical means of achieving this is through catchment based approaches with investment in nature base solutions
n/a

### 5.3 Other information respondents considered important when valuing surface water.

The final question in this section asked respondents if there were any other views they wished to express (Table 3).

Approximately equal number of respondents commented on specific aspects such as *biodiversity, temperature and flow* (33%) while 27% stressed the need for a holistic or comprehensive view noting for example '*A lot of overlap between the questions and ecosystem health, landscape beauty*'. Just under a fifth of respondents (17%) considered the importance of the attributes listed in Q1-23 were context dependant commenting for example '*Priority of issues will be site specific*'; and '*We must look at locations independently*'.

While one respondent questioned if they should consider the attributes to be assessed on '*a value or science based judgement*' suggesting the latter but noted '*clearly they are all important*'. The final three participants provided no further insight on their choice of which attributes of surface water they most wished to protect (17%).



Table 3 Participants responses to Q25 *Please elaborate and provide any other information you consider important when valuing surface water.*

<b>Comment on specific aspects</b>
Maintain or recover biodiversity
temperature / provision of natural shading etc. what is happening along the river banks is a key consideration. absence of barriers to migration is vital too
the protected uses of that waterbody, are missing from the lists above.
A broader assessment of chemicals
I think in 'lay/comms' terms 'clean and plentiful water' is a good framing
Also flow, for water resource and climate resilience. On the above my default answer was generally 'important' so am clarifying reasons for deviation: Identified inverts as particularly important given short lifespans and rapid response to stressors, so not only valuable as a component of biodiversity but also as an early warning system. Clarity of water less important as does not equate to unpolluted, therefore not a comprehensive measure. I view Cyanobacteria specifically more of a 'user' concern than a biodiversity concern, but would think action to avoid algal blooms would also benefit cyanobacteria presence. For phosphate see Part 2 Re POPs I have opted for 'critically' due to their persistent nature; this means early detection leading to control efforts is essential given the relative lack of solutions once they're out in the environment. Metals neutral although should not be complacent just because they are not currently holding back the achievement of GES in many waterbodies Plastic debris in general less of a concern than microplastics (consider the former litter, with relatively limited biodiversity impacts, vs the latter with potentially significant biological impacts) (- accepting that large plastics will generate microplastics eventually so should be tackled too!). Don't know enough about detergents other than that phosphate in detergents was a concern that has been largely dealt with, though maybe they are more harmful than I think?
<b>Comprehensive view required</b>
Ecology prioritised above human enjoyment.
Surface water provides a critical habitat for biodiversity in addition to a range of ecosystem services. Improving condition is vital to climate change adaptation and biodiversity recovery
Pressure assessment and ecosystem services
A lot of overlap between the questions - for instance river profile and sinuosity, algal blooms and cyanobacteria etc. Hard to comment effectively where there are particular concerns (say 'pharmaceuticals') without context - of course this is a concern if it reflects an significant adverse impact on wildlife - but if no impact is it critical in isolation?
ecosystem health, landscape beauty
<b>Criteria context dependant</b>

Priority of issues will be site specific - all could be critically important depending on the level at a particular site.
For an individual water body, you need to consider which of the above are the limiting factors for the outcomes you are trying to achieve and this is what will determine the overall importance for that water body. It could be argued that overall we are seeking thriving river ecology and the limiting factors for this will vary river to river. If we are seeking an outcomes-based approach, which many are, the importance ranking above is almost irrelevant as it will be a case of working this out for each waterbody on a case by case basis, working with local partners and catchment partnerships to establish what are the outcomes and what are the limiting factor.
I think this question is missing the point somewhat. We must look at locations independently. Some locations with high biodiversity should be protected. Whereas some places where farming is of critical importance to the local community and for food security, then this industry need to be reflected in the overall objectives or any water regulations.
<b>Value or science-based judgement</b>
I'm not sure whether this is supposed to be a value or science based judgement... should probably be the latter and clearly they are all important
<b>No comment</b>
n/a
n
no

## 5.4 Conclusion of section 1

Biodiversity attributes were considered by participants as the most critically important elements requiring protection closely followed by the need to monitor the dangers of insecticides, phosphate content and ammonia.

Only one person classed any of the 23 attributes mentioned as unimportant (plastic debris) but they and most respondents (78%) classed microplastics as important or critically important.

Over half of respondents (56%) recommended not focusing on specific species and a further 28% did likewise but offered qualifications to their answer. The majority of those who provided a rationale for their response recommended a wider than single species focus but many considered there may be occasions when specific species should be the focus.

# 6. Section 2 - Views on current WFD Ecological Status Classification

## 6.1 Most appreciated and most disliked

The first two open questions in this section asked what respondents most appreciated (Table 4) and most disliked (Table 5) about the current Water Framework Directive classification.

One respondent covered almost all the aspects which other respondents noted they liked about the WFD classification system when they wrote: *The focus on ecology (i.e. outcomes, broadening out from historic focus on water quality); the concept (even if not achieved in practice!) of taking account of the whole water environment, a systems approach (and recognition of the importance of catchments and of stakeholder involvement); the 'safety' of the one-out, all-out assessment, the hierarchical nature of element - component - status.* In addition, to the holistic aspect (39%) and systems approach (28%) which the majority noted three respondents specifically mentioned they liked the *One out all out* approach and two respondents highlighted the *ambitions of the WFD*.

Table 4 Participants responses to Q26 *What do you appreciate most (most valuable) about the current Water Framework Directive classification?*

<b>Summary of many aspects</b>
The focus on ecology (i.e. outcomes, broadening out from historic focus on water quality); the concept (even if not achieved in practice!) of taking account of the whole water environment, a systems approach (and recognition of the importance of catchments and of stakeholder involvement); the 'safety' of the one-out, all-out assessment, the hierarchical nature of element - component - status.
<b>Holistic approach</b>
Its holistic approach and the need for all elements of environmental quality to be in good condition to achieve a particular status
Ambition to protect most sensitive species through EQS. High profile, lots of people aware and can relate to it.
It gives a picture of the ecological/biological status both locally and nationally and highlights where management efforts might need to be directed
That they tried to focus on ecology.
The broad concept of an holistic overview of ecological quality is sound - it is the detail where it fails (as below)
Common framework for all water bodies Measures a range of different parameters to determine the condition of surface water Highlights risks to surface water and creates means of communicating surface water condition the ability to look across a range of determinands across years and across waterbodies.

<b>Systems thinking</b>
the integrated pressures-measures approach
Being able to look in detail at the different elements (limiting factors) of ecological status is useful for identifying what may be preventing us from reaching the desired outcomes in a water body-this however usually has to be backed up with additional data. This can then help define the action needed to achieve the desired outcomes. These limiting factors are generally representative of those that are applicable today.
inclusion of direct assessment of the ecology. the five level categorisation is a simple to understand framework compared to what was in place previously
the classification boundaries, are easy to use, in terms of looking at the high good moderate poor bad status, easy to take an interpretation away from that.
The WFD has been the most substantial and ambitious piece of environmental legislation to date but is very complex not just because of the daunting technical and organisational challenges of its implementation, but cause it requires a paradigm shift towards systems thinking that goes beyond single disciplines (i.e., ecology) and traditional administrative boundaries. This is why the Commission introduced the Common Implementation Strategy (CIS), a recursive process of provisional goal-setting and revision based on an experimentalist approach to water governance.
<b>One out, all out</b>
One out, all out
High threshold for Good Status. One out all out mechanism.
Really value the 'one out all out' approach because ecological status is wider than just specific groups (notwithstanding [named attendees comment] points, as he's obviously way more scientifically knowledgeable than I am). Lots of effort has gone in to setting levels for each element to make the ecologically meaningful - we really value this effort, and would wish Defra avoid changes that lose that work. Value the attempts, to some extent, to be holistic, by linking to the habitats directive, for instance by requiring water-dependent SACs and SPAs to be on the protected sites list raising the need to focus on them to deliver the environmental objectives.
<b>Ambitions of the WFD</b>
A general ambition to improve water quality.
The ambitions of the WFD was for me the greatest think about it. From it's inception I felt it was legislations that could bring about fundamental changes to the aquatic environment. It has brought about a lot of funding within the water industry and enables lots of people to develop their careers in the environmental sector.

Respondents mentioned multiple aspects that they did not like about the current WFD classification and its implementation making simple allocation of comments to a single issue impossible (Table 5).

In general, six themes that respondents disliked have been highlighted in this analysis: **Overall approach** e.g., *assumptions about ecological status that are not based on evidence; Too much of a focus on writing reports and plans, not nearly enough on delivery arrangements.*

**Implementation** e.g. *Not so much issues with the WFD, but our implementation of it; Poor enforcement; Too many derogations which have been over-exploited.*

**Sampling frequency and location** in terms of temporal scale e.g., *determinands have changed over the years* and spatial scale *Changing metrics and sampling points*. Generally summarised by the comment *much of the data is patchy, or out of date.*

**Elements sampled** *No inclusion of nitrogen compounds directly as an element; Unclear whether thresholds for elements are still appropriate in a changing climate; The conflation of 'truly' ecological metrics with various chemical parameters (not least P!)*

**One out all out method** considered a blunt protocol e.g. *does not give an indication of what is driving the overall status; masks progress; hide[s] improvements*

**Lack of statistical rigour** *Need for clear set of indicators that can be used to develop statistically robust means of determining status.*

Table 5 Participants responses to Q27 *What do you dislike most (most unhelpful) about the current Water Framework Directive classification?.*

Its assumptions about ecological status that are not based on evidence but on local policy priorities and co-effectiveness approaches
Its implementation,
The difficulty in holding government to account for delivery. Too many derogations which have been over-exploited. Too much of a focus on writing reports and plans, not nearly enough on delivery arrangements.
Lots of chemicals not covered - EQS not necessarily protective of most sensitive species, lots of gaps in evidence. Need to consider pressures in relation to climate change and context. Need for a more holistic approach - including terrestrial. Only considering chemicals in isolation, not mixtures. Lots of different aspects to consider - one good/bad status might be over simplified representation of what's going on. No consideration of ecosystem function, including carbon sequestration. Need to consider rivers differently according to whether they are chalk streams etc which might be very different to upland streams.
Not so much issues with the WFD, but our implementation of it. I think it's a real mistake not to include nitrogen in the measures. Our technical experts are saying that the science has moved on from a period when 'nitrogen' was only considered limiting for estuaries, and that in some instances, there are co-dependencies including nitrogen. Given Penny Johnnes' initial findings, it sounds also as though organic nitrogen is more impactful on biodiversity than nitrate, so future measures should introduce nitrogen, but not be solely nitrate. Also much of the data is patchy, or out of date, so that's an issue.
determinands have changed over the years, there some significant gaps and the collective assessment does not have sufficient resolution and specificity for the way we use them.



<p>Poor enforcement          Could be improved to create greater focus on catchment scale action          Need for clear set of indicators that can be used to develop statistically robust means of determining status</p>
<p>No inclusion of nitrogen compounds directly as an element. Gaps in monitoring data and low frequency of re-assessment of water bodies.</p>
<p>The one-out all-out rule seems to create a largely unachievable and unnecessary level of ambition and acts to hide much of the progress made on underlying indicators.          Mixture of (poor) chemical pressures and (good) ecological measures underlying ecological status can needlessly drive investment in pressures when the ecology is fine.          The threshold value for chemicals of 0.1 µg/l being based on the limit of detection at the time of setting this rather than an accurate assessment of risk. [Note these remarks referenced by respondent in Q32]</p>
<p>An overall ranking (i.e. Good Ecological Status) often obscures the limiting factors in a waterbody due to the one out all out principle. Many of the partners we work with (particularly local and combined authorities) use GES as a target, which while is a good target, may mask progress made by partners to deliver on improving against the limiting factors that are important, so the general public (and in some cases the regulator) perceives no progress as being made as only high-level status is reported. In addition, the data behind some of the limiting factors that are identified as an issue in WFD is not sampled regularly enough or is just modelled rather than actually sampled, leading to a water body not achieving good, even though in reality it may if the water body were sampled or sampled more regularly.          In addition, water companies are told they should focus particularly on phosphorus reduction, which may not be the limiting factor in a water body, but WFD limits their spending to focusing on this pressure rather than allowing flexibility to invest in improving other limiting factors (e.g. paying for barrier removal) if phosphorus isn't the main (or at all a) limiting factor. So in essence WFD limits investment in its current form, not allowing more holistic outcome-focused spending.          The frequency and how sampling is done currently in WFD is also not useful. Sampling and updates are not frequent enough to understand what progress is being made when projects are delivered, and how pressures and limiting factors are changing to aid in better-targeting work to deliver on the desired outcomes. Additionally, questions are also raised on if the data used to inform WFD is reflective of the actual situation in the water body if a given element has been modelled rather than actually sampled.</p>
<p>One-out all-out. This serves to mask progress towards good status and leads to perverse situations where direct ecology assessments show a waterbody to be in good status, but we can't report good ecological status because of a failure on one of the other measures.</p>
<p>1) The conflation of 'truly' ecological metrics with various chemical parameters (not least P!)          2) ideally 'nutrients' could or should be considered separately if the results are inconsistent with measured ecological diversity/abundance          3) Current classifications hide improvements that are being made due to the one-out-all-out regime as noted, e.g. fish, (this is a wider issue when chemical status is incorporated as well)</p>
<p>the classification methodologies and classification monitoring points have changed and moved over time, therefore not directly comparable. There also still many errors in terms of representative sampling points, and lack of overlapping sampling points for ecology and water quality. lots of older data used to classify (rolled over).</p>

There seems to be a lack of continuity in sites measured and the methodology used - it might not always be possible to sample at the same sites, but effort should always be made to do so. The one out all out method does not give an indication of what is driving the overall status
Changing metrics and sampling points.
WFD has resulted in huge investment within the water industry. There has been no equivalent investment in other impacting sectors. The way that WFD is regulated brings about inefficient investment. For example a location that is poor for fish due to fish passage, but moderate for other biological parameters and phosphate will result in investment at sewage treatment works. This is despite the fact that status will remain poor especially if fish passage is the reason for not achieving good. Too much focus on phosphate
The way status and progress is communicated (including that the causes of many 'reasons for failure' are unknown and that direction of travel within a class is not apparent; is a waterbody at 'Good' about to deteriorate to 'Moderate' or to improve to 'High'?. That one-out, all-out masks progress - though I very much see this as a communications issue rather than a structural issue) Unclear whether thresholds for elements are still appropriate in a changing climate and whether 'Good' will provide sufficient habitat and species resilience - how does the WFD account for adaptation? Insufficient link with status of Protected Areas - whilst accepting that 'Good' under WFD was never meant to indicate that the site would meet PA Conservation Objectives, it's suggested that some stakeholders (e.g. LPAs) take Good to mean that everything's fine and therefore miss opportunities to take action to meet PA objectives.
Nitrate not included for surface freshwater bodies

## 6.2 Scale of interest

Over half (61%) of respondents indicated that they were interested in WFD results at multiple scales. The majority (Fig. 3) were interested in the results at the scale of the water body (78%), catchment (67%) and slightly less at the national scale (50%). Only one responded replied they were interested in the district scale, but it should be noted they also indicated interest in all three other scales as well.

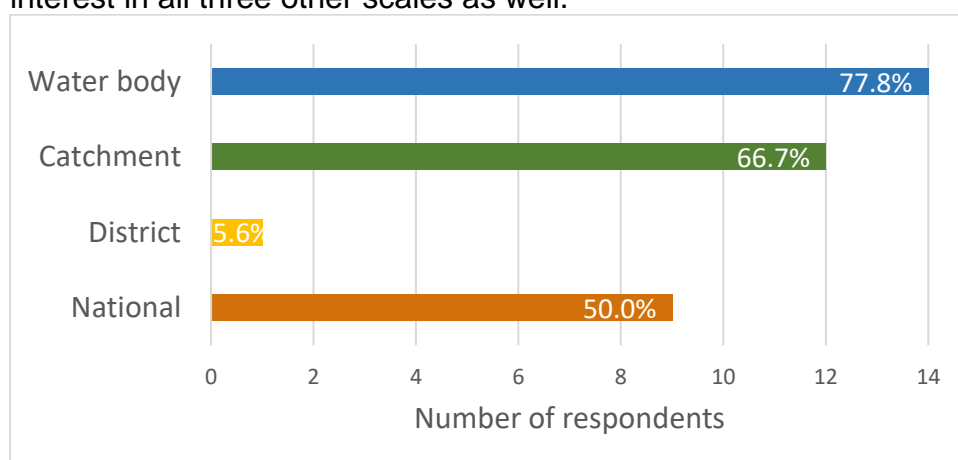


Figure 3 Responds to the Q28 At which scale are you most interested in the WFD results?

### 6.3 Confidence in personal knowledge of what ecological status means in the WFD

Almost three-quarters of respondents (72%) reported they were confident they understood the meaning of ecological status in relation to the WFD (Fig. 4).

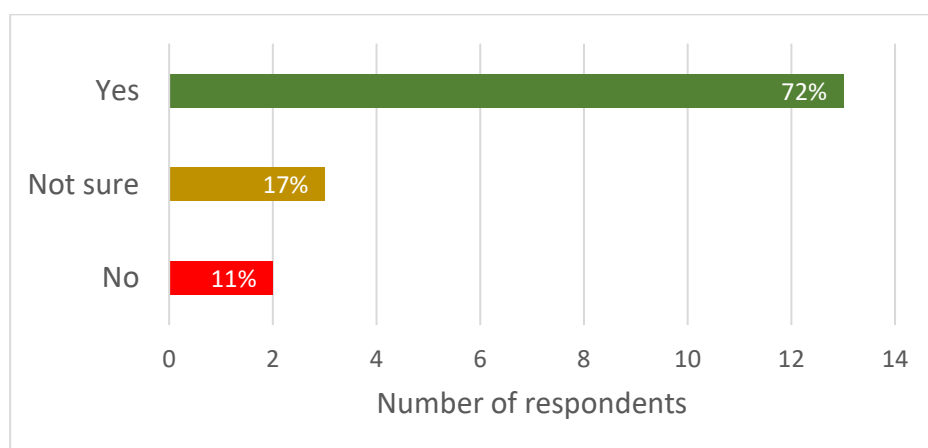


Figure 4. Number of respondents who were confident they understood the meaning of ecological status in relation to the WFD (Q29).

However, even those who indicated they were not sure or were not confident when asked to elaborate (Table 6) the majority wrote either an explanation or indicated they have a fair idea of what ecological status meant in relation to the WFD e.g. *Broadly, I understand, but the underlying methodology is very complicated; I have a rough idea, but couldn't give you chapter and verse.*

Table 6. Participants responses to Q30 which asked, 'Please elaborate and explain what you consider ecological status means in the WFD' grouped by respondents response to Q29 'Are you confident you know what ecological status means in the WFD?.'

Yes - Confident
no more than minor deviation from a natural state
in essence the ecological status is/should be an indication of the level to which the biodiversity is deviating from what it would be had the waterbody had not been subject to anthropogenic activities
Ecology is achieving a situation that is not putting species at stress.
Water body meets the threshold for all elements in the assessment framework.
It is a mixture of measured ecological quality and pressures presumed to influence/impact the ecological quality, leading to some inconsistency and adverse classification scores
In my view ecological status is a composite of indicators of surface water health. It determines the cumulative effect of those various indicators. But it is vital that this is supported by consistent high quality monitoring to enable change to be determined overtime.

Individual elements are classed bad to high. The worst class is taken from the biological elements (fish, diatoms etc) (bad to high). The phys-chem elements (including p) is capped at moderate (Mod to high). It also takes into account hydro-morph and chemicals. The worst class from each group of elements becomes the overall ecological status.
It's a status not reflective of ecology, but of assumed and sometimes observed pressures, Status is a policy tool for changing behaviour, mainly of farmers and landowners, towards the environment.
I was pretty familiar with for example the classification datasheets, which I've used and analysed repeatedly over the last 6 years, and am familiar with the regs themselves. I know what's in there and some of the science behind it, but my background is more general biology (albeit with a 3rd year final project on limnology 'why do some gravel pits have cyanobacteria neighbouring ones not') and environmental science rather than freshwater/hydrology, so wouldn't claim to be a scientific expert here.
the ability of a water body to support (or not) good biodiversity
In the WFD, Good Ecological Status is not defined as a slight variation from undisturbed conditions, but an “expression of the quality of the structure and functioning of surface water ecosystems”. Good ecological status is the state of the system in the absence of any anthropogenic pressures, and should be treated as a performance/normative indicator for Environmental Policy and not a descriptive ecosystem-based measurement (see paper The EU Water Framework Directive: From great expectations to problems with implementation).
A measure of the deviation from natural conditions, due to human-induced pressures, with the default ambition of 'Good' indicating only a slight deviation - and which should be the objective to reach wherever it's cost-beneficial to society to do so.
NA
<b>Not sure</b>
I have a rough idea, but couldn't give you chapter and verse
Don't work in great detail directly with WFD. Have put not sure because I'm between no and yes.
It describes the biological status of a waterbody with respect to what would be expected in the absence of any (anthropogenic) disturbance/pressure be it driven by pollution, water quality parameters, hydrology or whatever
<b>No - Not confident</b>
Ecological status is an aggregated ranking based on the ranking of a number of elements which are limiting factors on river ecology (e.g. chemicals, flow, temperature, habitat) and rankings of measured river ecology (including fish, plants, inverts, macrophytes etc). This applies a one out all out process where good can't be achieved if one element/ecological element isn't good.
Broadly, I understand, but the underlying methodology is very complicated.

## 6.4 One out all out

Respondents reported both positive and negative aspects of the 'One out all out' principle. Responding to the specific question Q31. *'Do you agree that a failure in one individual element, such as a chemical, should prevent a waterbody being designated as good ecological status (good potential in the case of A/HMWB) even if all biodiversity elements were at good status (One out all out)'* 44% responded no they disagreed, 39% responded yes and 17% of respondents selected the unsure option (Fig 5).

Analysis of the accompanying narrative (Table 7) indicates that many who answered yes or no saw advantages with the approach had misgivings about the principle. For example, a respondent which answered yes commented *Yes - provided that we are confident that the element in question is likely to be impacting the biodiversity of the waterbody*; and one who responded no commented *However, if WFD status means there is more public pressure to keep rivers clean then I don't think that is necessarily a bad thing!*

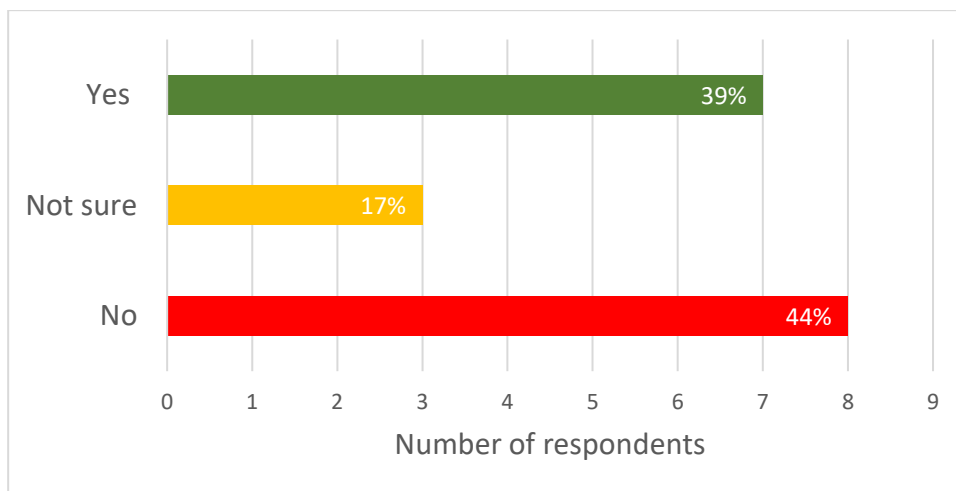


Figure 5. Responses to the question, Q31 *Do you agree that a failure in one individual element, such as a chemical, should prevent a waterbody being designated as good ecological status (good potential in the case of A/HMWB) even if all biodiversity elements were at good status (One out all out)*

Table 7. Participants elaboration of their response to Q31 *‘Do you agree that a failure in one individual element, such as a chemical, should prevent a waterbody being designated as good ecological status (good potential in the case of A/HMWB) even if all biodiversity elements were at good status (One out all out)?’*

<b>No – disagree that one individual element, such as a chemical, should prevent a waterbody being designated as good ecological status</b>
Just because there is a pressure present, doesn't necessarily matter if there is no impact. If biodiversity is not being impacted then probably ok. However, if WFD status means there is more public pressure to keep rivers clean then I don't think that is necessarily a bad thing!...should make sure we spend resource on right things though.
The chemical status may be important to downgrade ecological status below what the biological status might suggest (the biology may take time to reflect the physio-chemical status). However it may also work the other way in that short-term changes in physico-chemical status will have no effect on the biology and so needs to be applied with caution.
While it may fail on one element, if say fish, invertebrates and macrophytes are all thriving this would suggest there is sufficient water quality and habitat for a thriving river ecology. This would suggest that potentially those elements should perhaps have more weight as they show if the ecology is thriving or not. Other elements do become important if fish, invertebrates and



<p>macrophytes are not thriving but more to consider what is limiting the ecology, but we have to consider more is the ecology thriving rather than one element that supports that failing resulting in not achieving GES.</p>
<p>we can, and do, have rivers where direct assessment of the ecology show good status but overall class can be less than good. this drives a 'number chasing' exercise to drive an improvement that has not material benefit to biodiversity</p>
<p>Please see answer to question 27... this hides good progress with underlying indicators, breaks the link between pressures and outcomes, and puts perfect at the enemy of good.</p>
<p>often one of the main reasons in the north east area of not achieving good ecological status is connected to heavily modified waterbodies, where mitigation measures have not been set or achieved. often the mitigation measures are not appropriate, or an update to the system is missing. This then skews classifications on an admin error rather than any impact. If fish, invertebrates and plants are at good status the waterbody should be as well.</p>
<p>This demonstrates inconsistency of the standards being applied when the proper measure of ecological quality (biodiversity) is precisely that.</p>
<p>It is more complicated than one out all out, because the one out might be interlinked with other measured ecological and other elements</p>
<p><b>Yes – agree that one individual element, such as a chemical, should prevent a waterbody being designated as good ecological status</b></p>
<p>There may be some need for more fundamental science if there is a discrepancy between failures for some elements and ecological status, but principle of one out all out is sound. Sampling for biodiversity elements has more uncertainty, so greater risk of a falsely positive picture. Needs to consider multiple stressor factors. Failure in some individual elements can propagate downstream and affect downstream biological communities.</p>
<p>I think this makes sense that overall that if a surface water fails in one indicator it is appropriate that this is reflected in the overall score. It is vital that an appropriate set of indicators are selected and measured to ensure the most useful status. It may be useful to present this overall status alongside a breakdown of the indicators to better inform management decisions.</p>
<p>I think the overall principal of one out all out is a good way of focusing investment. In reality on phosphate is ever focused on.</p>
<p>Yes - provided that we are confident that the element in question is likely to be impacting the biodiversity of the waterbody. This is because it is important to provide a safety check, as biodiversity monitoring is not infallible; it will be based on only a few measurements throughout the year and may by chance provide an overly positive picture. Often the elemental assessments are not aligned (e.g. Phosphorus fail vs macrophyte pass), so this is a way of ensuring that we are not picking the positive view when in reality the pressures remain a risk.</p>

<p>I think the key thing here is that we don't know exactly what drives particular biodiversity or habitat outcomes (or indeed drinking water safety if you think about novel pollutants). For this reason it's critical to look at a range of indicators which we know affect ecosystems even if we don't know how (or where - maybe it becomes important downstream where two pollutants meet).</p> <p>We had an interesting conversation about this in the meeting, there are examples of where it drives 'reporting problems'. But what I think it is really important for is indicating overall health of the system. If there's a significant pressure in a waterbody, it's surely influencing the biodiversity in some way or another - it's not just about how many species, but which, for example.</p> <p>So I think it's really important to keep GES, but also recognise that there should be another metric alongside it that is better able to reflect improvements where there have been some.</p>
<p>The 'one-out all-out' principle is a key principle that reflects the WFD's integrated approach for the protection of water resources and aquatic ecosystems (see note from the Commission back in 2015). It requires the appropriate selection of quality elements in the planning phase. Quality elements comprised in the definition of ecological status provide a holistic picture of the health of the aquatic environment. The overall status would only be 'good' if all the elements comprised are at least considered 'good'. This ensures that all pressures capable of degrading the water status are addressed and is a guarantee of the environmental integrity of the objectives of the directive. However, without in depth understanding of catchments and management that is aligning human-nature interdependencies with the goal of improving the system as a whole, under an ecological vision that considers human activities as a source of disturbance and water quality degradation, the principle does not work. Still, instead of dropping the 'one out, all out' approach we should be improving catchment understanding to utilise appropriate quality elements in the assessment.</p>
<p>NA</p>
<p><b>Not sure</b></p>
<p>I can understand the frustration with this because it can mask progress, but I think that we shouldn't diminish the importance of chemical pollution and we could celebrate progress in other ways.</p>
<p>Perhaps not all need to be good but you just be able to explain the reasoning in every instance.</p>
<p>we want to demonstrate where a river is in good status. it is important to understand what is happening in chemical determinands, if they are not ones that impact on ecology then maybe they don't matter - but if we don't measure them we don't know.</p>

## 6.5 Data discovery

The vast majority (83%) of respondents reported they had tried to discover which specific element was leading to the failure to reach good status at the local or other scales while the remaining 17% had not tried or were unsure if they had tried (Fig 6).

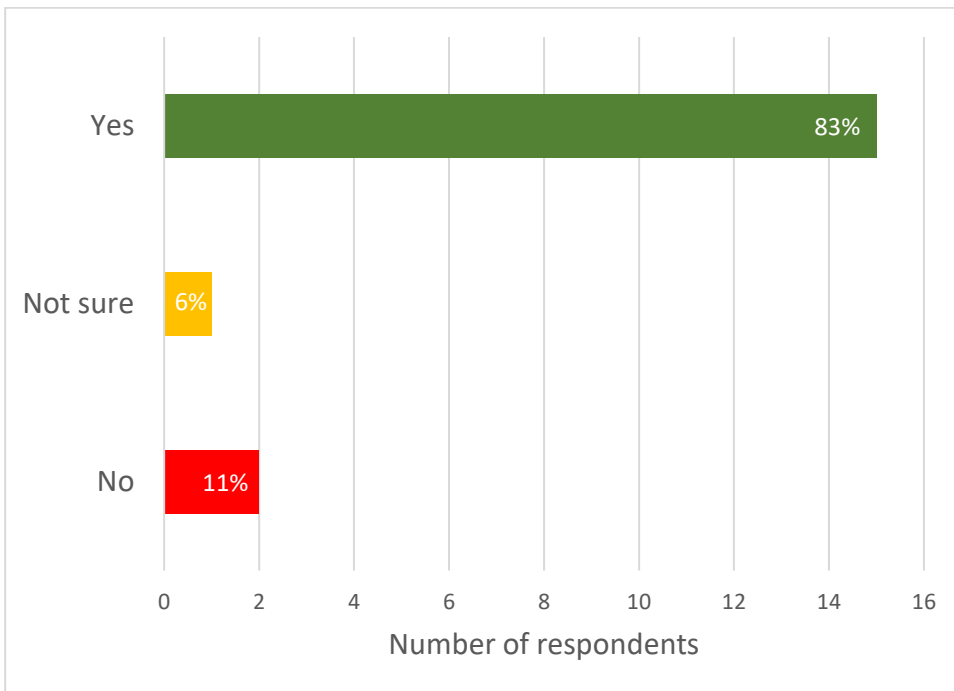


Figure 6. Responses to the Q33 *Have you ever made efforts to discover which specific elements are leading to the failure to reach good status at the local or other scales?*

Over half (61%) reported they had found it difficult to discover which specific elements were leading to failure to reach good status (Fig 7).

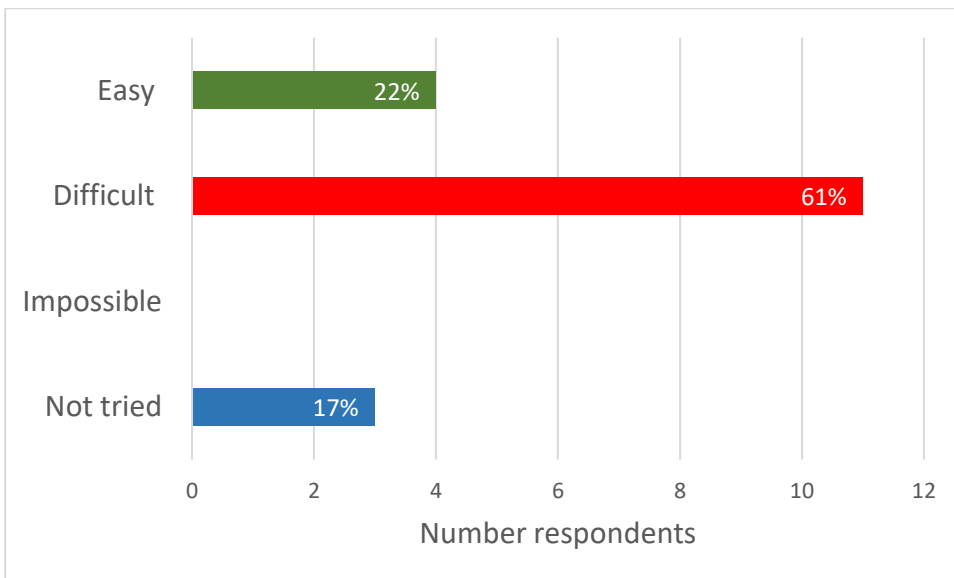


Figure 7. Responses to the Q34 *Have you found it easy to discover which specific elements are leading to failure to reach good status?*

Cross tabulation of respondents answered to these two questions (Table 8) revealed most respondents who had tried had found it difficult (73%) with only 26% reporting that finding which specific elements are leading to the failures to reach good status was easy.

Table 8. Participants combined responses to Q33. *Have you ever made efforts to discover which specific elements are leading to the failure to reach good status at the local or other scales?* And Q34. *If so, did you find it easy to discover which specific elements are leading to the failures to reach good status?*

Simplicity of discovery	Attempted to discover element leading to failure to reach good status		
	Yes	No	Not sure
Easy	4	0	0
Difficult	11	0	0
Impossible	0	0	0
Not tried	0	2	1

## 6.6 All elements monitored at all sites

The respondents had mixed views whether all elements should be measured at every site with 50% recommending that they should not and 39% considering that they should (Fig. 8).

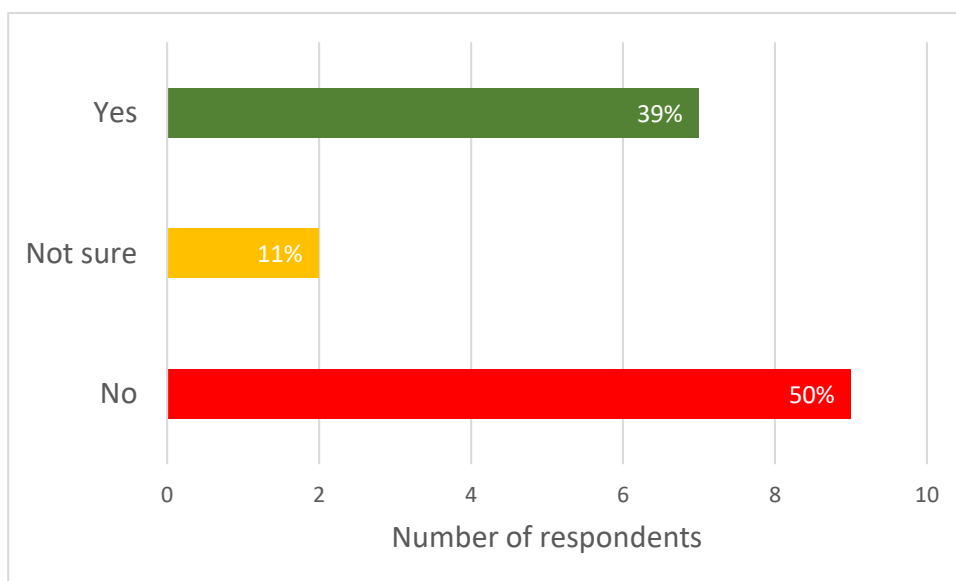


Figure 8 Participants responses to Q35 *Not all elements (such as all the chemicals) are measured at every site/waterbody, do you feel they should?*

## 6.7 Fixed monitoring sites

Over half the respondents (61%) considered monitoring sites should be fixed (Fig. 9) and a similar proportion considered there should be a lower limit set on number of sites monitored

(Fig 10). From the 11 individuals who considered monitoring sites should be fixed 64% considered a lower limit should be set (Table 9), three respondents were unsure and one respond did not recommend setting a lower limit to the number of sites monitored. The latter commented *It depends entirely on the local area* (Table 10). The need for context specific monitoring was echoed by many who answered both questions in a variety of ways e.g. *I think you would need stats power analysis to say how many the minimum is; Should be based on geography and population and the majority as LT [long-term] trends are valuable to understand, although I also recognise the value of having a more agile element to monitoring.*

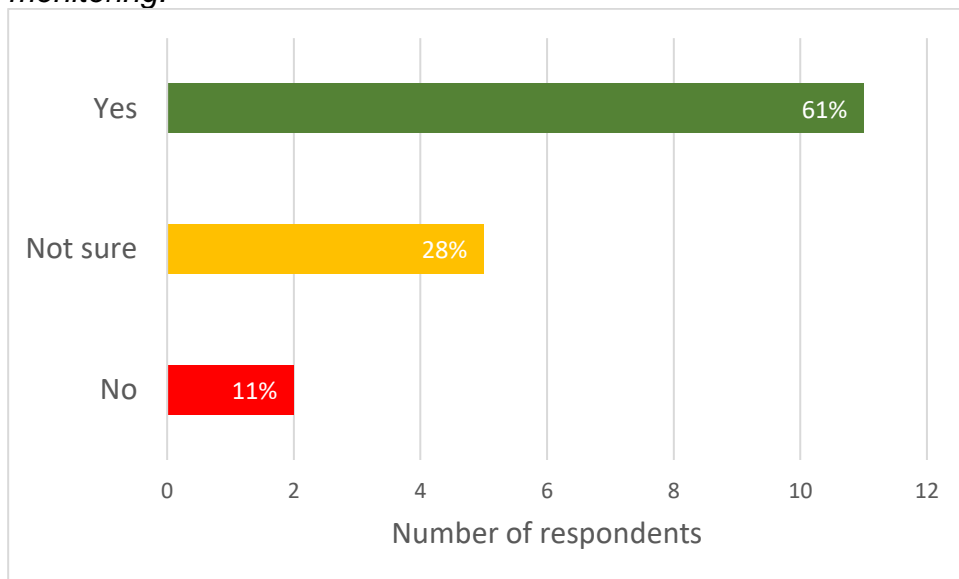


Figure 9 Responds view on whether monitoring sites should be fixed

Table 9 Participants combined responses to Q36. *Monitoring locations are not fixed (some can move from year to year), should they stay in the same place (so we can more easily check progress)?* And Q37. *There is no lowest limit on the number of monitoring sites required, should there be?*

There should be a lower limit set on number of sites monitored	Monitoring sites should be fixed			Grand Total
	Yes	No	Not sure	
<b>Yes</b>	7		4	11
<b>No</b>	1	1		2
<b>Not sure</b>	3	1	1	5
<b>Grand Total</b>	11	2	5	18

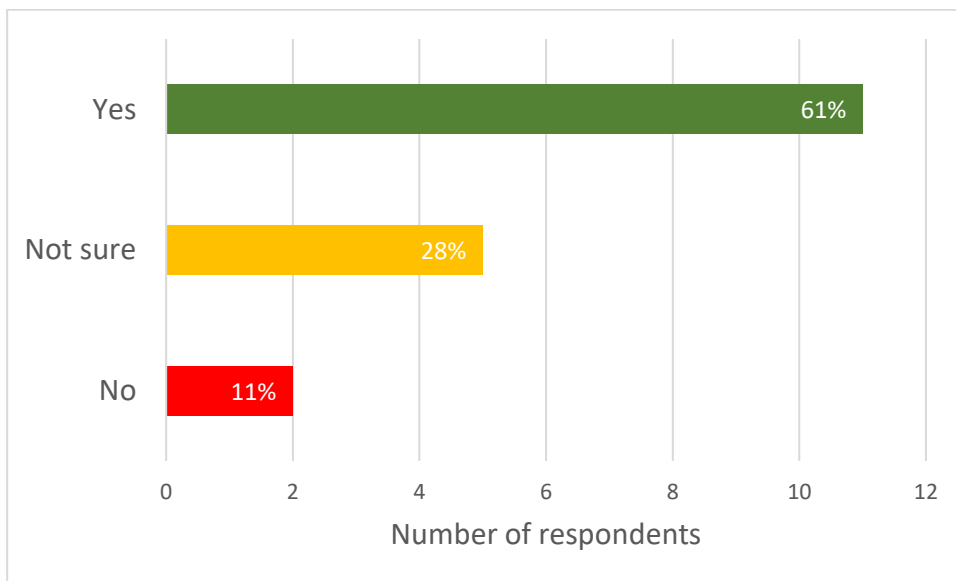


Figure 10. Responds view on whether there should be a lower limit on the number of monitoring sites required.

Table 10 Participants responses to Q38 which asked *How many monitoring sites would you suggest are needed across England and please explain to help us understand your suggested number of monitoring sites?* Responses grouped by answers to Q36 and Q37.

<b>Monitoring sites should be fixed and a lower limit set</b>
I'm not sure on a number but I think there needs to be regular fixed monitoring spots to provide year on year comparable results to help monitoring progress, with a high enough density of points available to allow reporting for each water body
at least 2 ecological monitoring points per waterbody - regularly monitored
No specific number in mind, but there are clear gaps in monitoring data, lower frequency sampling, fewer sites, moving sites etc. There is a need for more investment and improvements in the monitoring system to ensure we are getting an accurate picture and to allow tracking trends over time.
This must be related to the spatial resolution required - for instance how water bodies are defined. It would make sense for all identified water bodies to be monitored. but are all water bodies sensibly defined? If the WFD covers all waters then is WB monitoring adequate? There is a balance to be made between sampling efforts and value
There sample size needs to be sufficient to produce statistically robust assessments for all water bodies.
Just a key comment on 35 - no, not all (cost/benefit), but significantly more than are currently measured. And on 36, yes, but there could be exceptional reasons for shifting a small number of sites. Or 90% constant effort, 10% moving for example. 38 - I can't answer this question, but the number of monitoring points has declined over time - is this down to funding? So there should clearly be a 'statutory limit' to prevent this from being a continuous decline.

<p>I don't think it should be a minimum across the whole country but a sensible number per meaningful measure of waterbody. This requires waterbodies to be well identified and representative of a whole river that can then be aggregated across whole catchment. Questions 35 and 36 above are in the ideal world. This should not be forced where it makes no sense e.g. I have encountered EA resistance to river restoration on the basis that it would change the conditions at a monitoring site which would upset their long term view - this is a nonsense.</p> <p>Also we need to take a pragmatic view on all chemicals being monitoring at a site - ideally they would but realistically that is unlikely to economically viable.</p>
<p><b>Monitoring sites should be fixed and no lower limit set</b></p>
<p>It depends entirely on the local area</p>
<p><b>Monitoring sites should be fixed and unsure if a lower limit should be set</b></p>
<p>I don't have a suggestion for a specific number, but need to cover the whole country adequately. May need more sites in "problem" areas, but would need to somehow weight results overall to allow for this to present the overall national view.</p>
<p>Should be based on geography and population.</p>
<p>Acceptable that numbers vary according [to] the variability within an individual waterbody, e.g. some reaches are relatively consistent in character so multiple monitoring points may be unnecessary whilst others (often headwater bodies) are more variable in character and single monitoring points, often at the downstream limit, may not be representative of the whole waterbody. Similarly acceptable that no. of monitoring points can vary by element, depending on the 'science', so how many sites should be used for fish vs phosphate or whatever, in order to give a reliable enough result.</p> <p>Q34 - I use Catchment Data Explorer and also CaBA GIS Data Package.</p> <p>Q35 - Useful to know pressures; absence of monitoring may hinder our understanding and could be an aspect that could explain otherwise puzzling failures. However, legitimate to use an element of modelling not just monitoring; and legitimate to exclude aspects agreed not to be relevant / impactful - not necessary to monitor everything everywhere.</p> <p>Q36 - Yes at least for the majority as LT trends are valuable to understand, although I also recognise the value of having a more agile element to monitoring. Changes can be viewed sceptically by stakeholders who assume they are 'trying to hide the truth'; perhaps any changes in sites should be agreed with Catchment Partnerships so that there is no misconstruing of intention.</p>
<p><b>Monitoring sites should not be fixed and no lower limit set</b></p>
<p>Adequate number per water body</p>
<p><b>Monitoring sites should not be fixed and unsure if a lower limit should be set</b></p>
<p>It depends on the specific waterbody and the pressures within that waterbody.</p>
<p><b>Unsure if monitoring sites should be fixed agree a lower limit should be set</b></p>
<p>Many more than there are now, as the resolution is poor for local use and classifications can lead to perverse decisions</p>
<p>I think you would need stats power analysis to say how many the minimum is. I'm undecided about whether sites should be fixed. The WFD is at national level so we want to know the overall national picture, not site specific? Improvements should be everywhere?</p>



Would need evidence to determine answer to this
If WFD remains pressures-driven then we need a "bracketing approach", before and after the pressure. This cannot be applied to diffuse pollution pressures. There is a need for sampling at the receiving end of a catchment, for cumulative pressures evaluation. A monitoring programme assessing gradients in catchments with persistent problems and measures in place would help.
<b>Unsure if monitoring sites should be fixed and unsure if a lower limit should be set</b>
Not sure/// generally I feel monitoring should be increased but also risk-based.

## 6.8 PO4

Overall, 50% of respondents felt that PO4 levels are causing significant damage to river ecosystems (Fig. 11) with the remaining split almost equally between unsure (28%) and not considering PO4 levels are causing significant damage to river ecosystems (22%).

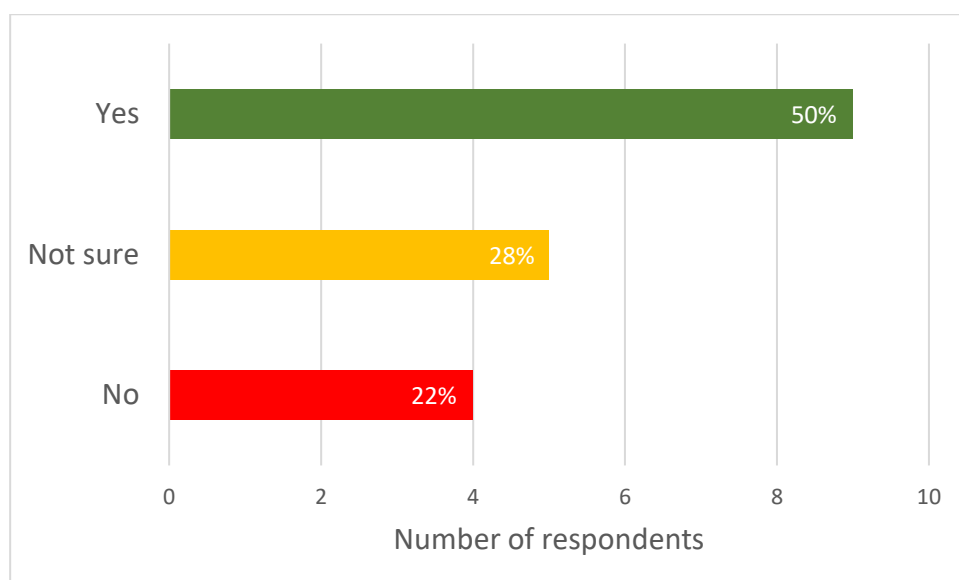


Figure 11. Participants responses to Q39 *PO4 is flagged in our WFD results as a major factor preventing good status. Do you feel that PO4 levels are causing significant damage to river ecosystems?*

Many respondents across all three options mentioned some element of context specificity (Table 11). For example, amongst those that consider PO4 levels are causing significant damage respondents commented *in certain catchments; This is a very site specific question - PO4 can be important in some cases but may not be*. While one who felt PO4 levels are not causing significant damage commented

*To be clear in some river systems this is yes, but it is certainly not the case in all rivers; and a similar view was expressed by a respond who answered they were unsure i.e. So in some cases the answer is yes, in others, definitely not.*

Table 11 Participants responses to Q40 (grouped by Q39) which asked respondents to elaborate on Q39 *PO4 is flagged in our WFD results as a major factor preventing good status. Do you feel that PO4 levels are causing significant damage to river ecosystems?*

<b>Consider PO4 levels are causing significant damage to river ecosystems</b>
I believe that's what the data say. However, I'm aware of some issues with regard to orthophosphate which I don't fully (or even partially) understand
Agricultural pollution leading to high levels of phosphates in rivers, causing significant issues in certain catchments
It is important in driving (direct) effects on primary producers and subsequent indirect effects.
Some catchments have a clear issue with PO4. Despite some historical reductions, in many places this reduction has now plateaued, and shows some signs of increasing again. Can't really look at PO4 in isolation - needs to also account for other phosphorus compounds, and nitrogen compounds, reflecting the latest science.
In lakes and ponds and slow moving water phosphates can lead to eutrophication and a reduction in oxygen which can impact on a range of taxa including macrophytes. In river and coastal systems we need better research to understand the true impact on biodiversity and ecosystem function.
PO4 is an important reasons for not achieving good. However, it isn't the only one. Unfortunately, there has been next to no focus on the other impacts. The approach to too high level and doesn't take into account local understanding or the wants and the needs of local stakeholders
I'm saying yes because, for example, the RePhoKus report suggests that it is the key pressure in the Wye where it has caused algal blooms and die offs. Secondly, because large fish die-offs occur associated with slurry overflows - that's not proof it's phosphorous, but surely it's a significant part of it.
This is a very site specific question - PO4 can be important in some cases but may not be -
Multiple impacts known through the science, upon inverts, fish (affecting development and reproduction), macrophytes (community changes), as well as aesthetic value and use value. Many biological impacts are chronic so won't necessarily be reflected instantly in biodiversity results, resulting in mismatches in P and Biodiversity status - so should be cautious of relying solely on biodiversity metrics. Significant aesthetic and use value impacts e.g. Huge algal blooms on the River Wye impacted tourism economy and water users, as well as wiping out ranunculus beds for 70 miles. (And concern is not just PO4; other fractions of P can be biologically available, so phosphate used as a proxy for phosphorus as a whole).
<b>Do not consider PO4 levels are causing significant damage to river ecosystems</b>
a Number of species rich, healthy, with crystal water and beautiful rivers breach the phosphate standard
It is just an indicator of the overall state
the impact is overstated - the direct ecological assessments don't suggest that PO4 is having a large detrimental impact to rivers (with the possible exception of rivers with lots of weirs - which can function akin to a series of lakes in low flow conditions)

To be clear in some river systems this is yes, but it is certainly not the case in all rivers and as previously mentioned the limiting factor needs to be considered on a waterbody by waterbody basis. In some rivers the focus on PO4 is driving investment in reducing PO4 where it is not the key limiting factor for ecology which prevents investment on those factors which are limiting ecology. In some rivers however, it is key to focus on PO4 if data that is regularly collected indicates if it is an issue rather than a snapshot as in WFD. Other elements such as invertebrates may indicate if PO4 and other chemicals are actually an issue as they will only be able to thrive if PO4 and chemical levels remain low so you can also use these other elements to indicate if water quality is an issue and if the ecological community there can handle that.

**unsure if PO4 levels are causing significant damage to river ecosystems**

Don't know enough to be able to answer definitely yes or no.

Difficult to understand at the moment.

What does the science suggest!? If biological indicators are good and P is not, then P may not be that important.

Phosphate is a pressure yes, but it's not a pressure in isolation it's usually combined with poor morphology, as well, to cause ecological impact.

There are likely to be sites where PO4 may be adversely impacting biodiversity; conversely it may be driving a far lower status than the biodiversity would suggest. So in some cases the answer is yes, in others, definitely not.

## 6.9 Fish population

Half of the responds (Fig 12) felt that despite fish abundance being stable for 30 years and fish richness increasing that things are still going wrong for the fish population of England while 44% were unsure and only one respond answered no as they considered fish passage was the primary problem with fish populations commented *No the biggest issue for fish is barriers, and there is no significant investment programme to improve fish passage* (Table 12).

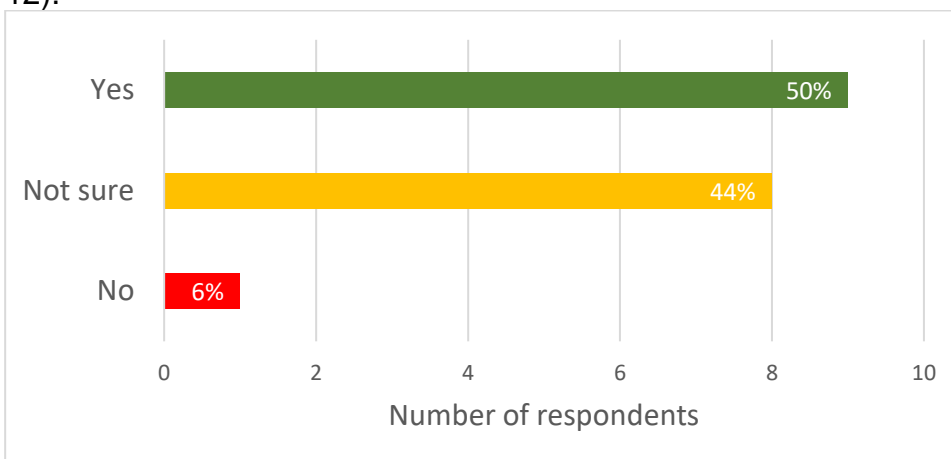


Figure 12 Number of respondents responding to Q41 *Although fish abundance has been stable for 30 years and richness has increased nationally, the WFD results flag up many locations as not having the right community present. Do you feel things are going wrong for our fish populations?*

Table 12 Participants responses to Q42 (grouped by Q41) which asked respondents to elaborate on Q41 *Although fish abundance has been stable for 30 years and richness has increased nationally, the WFD results flag up many locations as not having the right community present. Do you feel things are going wrong for our fish populations?*

<b>Consider things are going wrong for our fish populations</b>
Salmonid populations are declining rapidly. They may be being replaced by other species which are less pollution sensitive and this could give a misleading impression that increasing species richness is a positive indicator
It suggests that there are local issues regardless of whether there is a relatively good picture nationally
Yes, in the area we work a key issue is the number of barriers available to fish preventing migration and movement for spawning which is limiting the recruitment of juveniles and population growth. Additionally, these barriers are preventing fish from moving to suitable habitats for the time of year e.g. in hotter weather moving to where water is available and suitable shade. The habitat availability and flow diversity is limiting fish population. However, when we have undertaken work to address these issues we've seen an abundance of fish populations and diversity (including the desired populations_ increase through our own data. Over the last 30 years the limiting factors for fish have remained the same and now these are being addressed we are seeing more diverse and the right sort of communities repopulate catchments. This will be because if they have not been able to migrate and move around catchments due to the pressures, the right sort of communities won't have been able to reach that area, but now we are providing the habitat they are very slowly able to recolonize .
Especially significant for salmonoids and eels.
There are clearly major issues with some species e.g. salmonids
There are fish barriers everywhere that are really difficult to remove with EA and NE often at odds with each other over whether weir removal is necessary. Weir and pollution events means poor/bad status and will impact recolonisation
Yes because there are certainly some issues with some fish populations. The issue is what we want is for rivers to revert more closely towards their 'natural state' though of course it can never be 'fully natural', so defining that is difficult.
Salmon for example are now classed as endangered in GB, so efforts under WFD to improve their lot have not yet been fruitful. However, agree fish classification not always as expected. Various stakeholders suggest that some waterbodies incorrectly assigned (e.g. some chalk streams) as salmonid or cyprinid rivers, so 'expecting' the wrong populations. Don't recall details but have also heard the suggestion that some (non-harmful) naturalised species are 'marked down' as invasives which somehow restricts waterbody status. Would also be useful to distinguish more clearly between failures caused only by fish passage and those impacted by other issues as well; whilst this can be gleaned by interrogating CDE, such that stakeholders can locally understand and plan action, having the national overview may also help with (for example) more direction of funding towards tackling physical modifications. As an aside, I don't know that much about the fish metric, but from Andrew's presentation I wonder if it's possible to tell whether failing sites primarily fail due to lower-than-expected abundance, or lower-than-expected species diversity?
NA

<b>Do not consider things are going wrong for our fish populations associated with the WFT classification</b>
No the biggest issue for fish is barriers, and there is no significant investment programme to improve fish passage.
<b>Unsure if things are going wrong for our fish populations</b>
There are other pressures not included in WFD, such as climate change and humans. Big questions about what are we aiming for, what are the right communities given things like climate change? Not necessarily for fish species but think it is important to note that species richness can decrease where water quality improves (e.g. birds).
Perhaps they 'went wrong' rather than 'going wrong'
I struggled with the idea that richness is improving except for Salmonids and eels. The analysis presented certainly indicated that the classification system can lead to perverse overall classifications - and I have seen this locally where a single fish survey in a drought year dropped a moderate status to poor/bad
This needs to be further researched to determine the status of fish communities and evaluate potential drivers for patterns observed.
Fish populations are affected by multiple non-chemical factors. Some fish can serve as sentinel species as being top predators
it is well established that the lack of improvements in water status is down to the absence of appropriate measures developed through a process that requires the identification of significant pressures from point and diffuse sources of pollution, modifications of flow regimes through abstractions or regulation and morphological alterations, as well as any other pressures. The identification of significant pressures and their resulting impacts (which in turn lead to reduced status) are critical to the successful development of measures. Importantly, it is the WFD that recognises that “there is not going to be a single action for all water bodies that will improve biodiversity”, as different pressures are present in each body of water and different responses are required (see paper Water Framework Directive programmes of measures: Lessons from the 1st planning cycle of a catchment in England). There is not going to be a single action for all water bodies that will improve biodiversity (indeed every catchment needs to be assessed separately), the key messages in the last section refer to generic actions such as reducing agricultural pollution, improving wastewater treatment, restoring connectivity, assuming them able to result in widespread improvement in waterways.
NA
NA

## 6.10 Conclusion of section 2

Respondents list several aspects they liked about the current WFD including, the holistic approach and system thinking. Three explicitly mentioned the 'safety' of the one-out, all-out assessment, while two commented on the ambition of the WFD.

There were many aspects respondents did not like including:

- Overall approach
- Implementation
- Sampling frequency and location in terms of temporal scale and spatial scale
- Elements sampled
- One out all out method
- Lack of statistical rigour

The majority of respondents were interested in the results at multiple scales specifically the scale of the water body (79%), catchment (68%) and slightly less at the national scale (50%).

The majority of respondents (78%) were confident they understood the meaning of ecological status in relation to the WFD but even those who were not confident wrote explanations to an open question suggesting they had a fair understanding.

Respondents reported both positive and negative aspects of the 'One out all out' principle in almost equal measure 44% responded no 39% responded yes and 17% of respondents selected the unsure option. Analysis of the accompanying narrative (Q32) indicates that many respondents saw advantages with the approach but had misgivings about the principle as applied.

The majority (83%) of respondents reported they had tried to discover which specific element was leading to the failure to reach good status at the local or other scales while the remaining 17% had not tried. However, the majority who had tried had found it difficult (73%) with only 26% reporting that finding which specific elements are leading to the failures to reach good status was easy.

The respondents had mixed views whether all elements should be measured at every site with 50% recommending that they should not and 39% considering that they should.

The respondents had mixed views whether all elements should be measured at every site with 50% recommending that they should not and 39% considering that they should.

Overall, 50% of respondents responded that they felt PO4 levels are causing significant damage but, in all categories, respondents mentioned some element of context specificity in relation to PO4 levels.

Half of the respondents felt that despite fish abundance being stable for 30 years and fish richness increasing that things are still going wrong for the fish population of England while 44% were unsure and only one respondent answered no, they considered fish passage was the primary problem with fish populations commented which was echoed by others during the discussion at the webinar.

# 7. Section 3 - Views on altering a surface water classification system

## 7.1 Elements worthy of support in an alternative classification system

The majority (94%) reported that they would either support or strongly support a system which included reporting improving, stable or deteriorating trends (Fig 13.). While over half (56%) either supported or strongly supported a classification scheme where unbiased biodiversity (representative of that region/location) was the key indicator of success in a waterbody.

Most participants would not support a classification scheme based only on achieving targets for some chemicals and physical elements of concern. Only two individuals reported that they would support such a classification scheme. While 78% of respondents would not support a classification scheme based only on reporting the status of cherished organisms such as dragonflies or salmon. One individual would support such a classification and three reported that they might.

There was a more mixed reaction to the proposal to change the classification scheme to one based only on reporting the status of groups of organisms known to be sensitive to specific pressures (such as PO<sub>4</sub> or ammonia) with 50% reporting they would not support such a scheme; 44% reporting they did or might support such a scheme and one individual admitting they did not know if they would support such a scheme.

Participants were asked in an open question *Q48 Would you support a scheme which has a mix of several different quality and biodiversity indicators, if so which?*

Overall, 67% responded positively (Table 13) with many suggesting the mix include *biodiversity indicators; hydromorphological status and selected chemical/physicochemical parameters*; while others had a wider vision e.g., *include things related to climate change, invasive species, pollution for quality*.



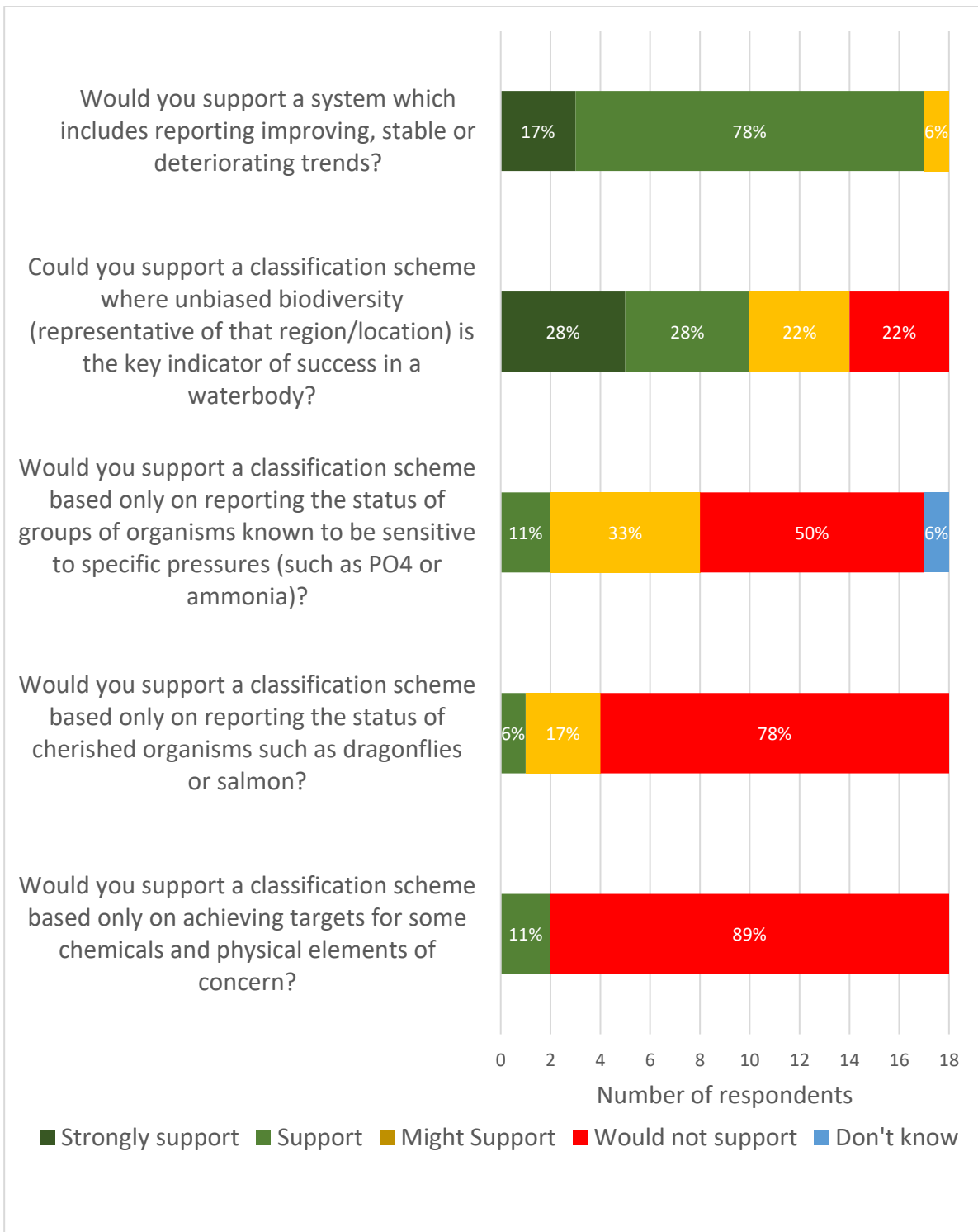


Figure 13 Participants level of support for various suggested alterations to the current WFD classification scheme.

Others were supportive of a mixed of quality and biodiversity indicators but considered *It depends entirely on the river/waterbody in question*. However, some who were supportive admitted they did not know where the focus should lay exactly e.g., *unsure of which indicators*.

Three respondents (17%) reported that they were not supportive of a scheme which had a mix of several different quality and biodiversity indicators. One considered the scheme should focus on ecological indicators *measuring biodiversity and abundance etc* while one admitted they would be *willing to change my mind if the explanations made sense* and another wrote *I believe the current legislation and guidance from the EU works and works well*. Two respondents were classed as unclear or unsure and one did not offer a view.

Table 13 Participants responses to Q48 *Would you support a scheme which has a mix of several different quality and biodiversity indicators, if so which?*

Support
Yes. Would need to be broken down more than it is currently. would include things related to climate change, invasive species, pollution for quality and biodiversity should be related to river type and ecosystem function.
Any classification scheme needs to measure a broad range of quality and biodiversity indicators. Not focus in on narrow measures
Would bias it towards biodiversity indicators as the main classification of status. There needs to be some understanding of the hydromorphological status and selected chemical/physicochemical parameters based on any prior knowledge and need to interpret, manage issues.
Yes, however it would be a case of pitching these in the right way. I think it would be the case you would include a series of limiting factors e.g. PO4, other water quality indicators, morphology, flow, barriers and these would be under the heading of limiting factors to ecology; but then also a series of measures of river ecology (e.g. fish, inverts etc). While this is similar to WFD I think each should have its own ranking which is displayed separately and clearly to help with the comms. But also removing the one out all out principle with more weighting given to the ecology rather than the limiting factors, as if the ecology is considered to be thriving this should be the most important thing.
I strongly favour a scheme that is based on a wide number of biodiversity indicators. as a secondary system we should also be monitoring the chemical quality parameters that could be causing waterbodies to be at less than good status. this would effectively be a two tier classification system - A headline one that is based of ecology and a subsidiary one that is measuring the pressures that cause adverse ecological impacts - this latter system is essential to informing interventions. Avoid having a system based on 'cherished' species - i want a natural ecology, not one based on photogenic species.
Yes, but unsure of which indicators.
Yes, a variety of indicators provides a means of determining the health of different elements of ecosystem health which can be used to inform decisions.

<p>It depends entirely on the river/waterbody in question. There also needs to be a large pinch of reality within this process. The targets gets on water industry are stringent but achievable. However 40% reduction in P or large farm scale interventions will impact farmers livelihoods and food security. There needs to be some recognition that some areas will never achieve the current targets. I think that the targets for a local environment need to be agreed and supported by all contributors to the issues. If a rare species are very important that that needs to be a focus, but people are an important part of the environment that have hitherto been ignored. Some locations recreation is an important factor, do reducing bacterial concentrations maybe the focus. Each catchment/sub-catchment needs its own unique focus. There needs to be more metrics to measure that takes into account the health of the entire environment including the local community.</p>
<p>Yes, only if analysis of data shows a link between water quality and biodiversity indicators</p>
<p>Yes, as noted above, a lot of work has gone into the existing data collection to make it ecologically meaningful, even if it's unclear exactly what impact it has from among the range of stressors across the piece. We should continue to use those unless the evidence shows that they are not useful. In the light of uncertainty, the mixed approach is surely the way to proceed.</p>
<p>Yes, including a combination of quality and biodiversity (as currently) provides a cross-check. Q43 loses the ecology connection and therefore the welcome 'outcomes' focus. Q44 if sufficiently comprehensive and Q45 if sufficiently confident in the representative biodiversity (conscious of shifting baseline syndrome) could both work, but even if the assessment of stressors were not a formal part of the assessment, monitoring would still be vital to understanding the causes of less-than-good ecological status. Q46 would be too limited, though could see the value of additional species inclusion from a public engagement perspective. Q47 yes visibility of direction of travel would be helpful.</p>
<p>In the absence of clarity on stressors, it strikes me that we need to monitor a range of both stressors and biodiversity outcomes but the former is more 'for information only' where as the latter is the measure of success or ecological status.</p>
<p><b>Not support</b></p>
<p>I believe the current legislation and guidance from the EU works, and works well. The issue is that we have overcomplicated it, and made it admin and monitoring heavy. The current system could be refined and improved, staff could be properly trained to use it, and we could properly fund the removal of pressures, as we would be more confident in the data.</p>
<p>At the moment no, but willing to change my mind if the explanations made sense.</p>
<p>Ecological status assessments should be precisely that, measuring biodiversity and abundance etc. So the current regime that mixes these with chemical parameters needs revision( as below). Hence I'd be reluctant to continue with a regime as we have at present that combines chemical quality with biodiversity metrics</p>
<p><b>Unclear or not sure</b></p>

The “capacity” of a freshwater system to provide services is conditional to its structure and functioning which in the context of the WFD is reflected on ecological status, and therefore “good status” can be seen as a prerequisite for ecosystem functions (see also papers The potential of using the Ecosystem Approach in the implementation of the EU Water Framework Directive as well as The potential of water reuse as a management option for water security under the ecosystem services approach).

Facilitating the implementation of the directive (see paper on A participatory ecosystems services approach for pressure prioritisation in support of the Water Framework Directive, as well as Incorporating Ecosystem Services in the Assessment of Water Framework Directive Programmes of Measures) and in reference to a report that claims that wetland restoration and reinstating riparian vegetation are best options for improving water quality compared to farmers actions to reduce pollution, reminiscent of policies that treated rivers as sinks into which everything could be disposed of to be carried away, and nature as a bottomless receptor capable of cleaning up anthropogenic pollution. Anyway, the “capacity” of a freshwater system to provide services is conditional to its structure and functioning which in the context of the WFD is reflected on ecological status, and therefore “good status” can be seen as a prerequisite for ecosystem functions (see also papers The potential of using the Ecosystem Approach in the implementation of the EU Water Framework Directive as well as The potential of water reuse as a management option for water security under the ecosystem services approach).

Instead, expecting the proposed indicator B6: Natural functions of water and wetland ecosystems which aims to track changes in the naturalness of ecosystem functioning across water and wetland ecosystems to replace the WFD’s ecological status in my view seems naïve and should be approached with caution as any policy that puts the focus on restoring natural functions before addressing pressures will end up targeting the symptoms and not the causes of biodiversity loss.

Not sure

NA

## 7.2 Focus of improving the WFD classification

Participants were asked in an open question *Q49 If you had the task of improving on the current WFD classifications, where would you focus?*

There was no strong trend in opinions offered by respondents with very many aspects mentioned (Table 14). Some respondents wrote out a strategy they would follow, others commented on the need for scientifically robust methodology e.g., *statistically robust dataset covering a range of parameters*. One commented on the economics suggesting a solution of *implementing citizen science to be incorporated into investigations, to minimize the cost to regulators*. The idea of uncertainty and the need to simplify reporting and communicating the results better were all mentioned. One participant did not answer the question while another simply wrote *I would tear it up and start again*.

Table 14 Participants responses to Q49 *If you had the task of improving on the current WFD classifications, where would you focus?*

<p>I would separate out the biodiversity/true ecological assessment as its own measure; then a 'nutrients' assessment; a physico-chemical assessment; and lastly the 'specific pollutants - although this should sit more comfortably with the 'chemical' status anyway.</p> <p>The data (e.g. physico-chemical, or whichever stressors) would still need to be collected to inform if or why the ecological quality is less than expected.</p> <p>Further detail would be to derive an appropriate weighting of the various biodiversity elements, such that macroinvertebrates were the principal determinant;</p> <p>Finally there needs to be an approach that could demonstrate improvements (where these are made) if these are within-class.</p>
<p>Elements monitored, monitoring premise (where and why selecting a site), ecological indicators, use or trial all possible biodiversity metrics from species diversity to human perception of biodiversity (colours of riparian vegetation, amenities, leisure, wildlife attracted by aquatic systems, the width of riparian areas for public benefits)</p>
<p>Focus on a range of issues based on the kind of scientific analysis Andrew proposed.</p> <p>Scale is important, at the national scale, I think the evidence shows that physical modifications, agricultural pollution and water treatment are the main issues. However, at the small scale, they may be irrelevant and something else is going on like direct human pressure. This is another reason for a wider analysis.</p> <p>Nitrogen should be a bigger part of the picture than is currently the case.</p> <p>Just on that first point, I referenced Christian Schuerings' (h u umlaut r) work which in summary says:</p> <ol style="list-style-type: none"> <li>1) They did studies using almost entirely measured data in Germany, and also Europe-wide mainly with modelled data.</li> <li>2) For the German part, the scale was unusually fine both in terms of the 10x10m plots and the categorisation of agriculture to about '25' crops/land-uses rather than grass/arable.</li> </ol> <p>Results/conclusions</p> <ol style="list-style-type: none"> <li>3) Macrophytes (non-microscopic plants) and Macroinvertebrates (non-microscopic invertebrates) were strongly affected by pesticides and less so by nutrients, whereas Diatoms were strongly affected by nutrients and less so by pesticides</li> <li>4) They did some aggregations and other number-crunching which showed that of at least 3 'agriculture typologies/groupings' they tried, 'agricultural intensity' had the strongest effect on the indicators of river health – more so than 'overall agriculture' and 'cropland'</li> </ol>
<p>The WFD addresses socio-hydrological systems that are reflexive, adaptive, non-linear, complex and have feedback loops, emerging properties and non-predictable responses to management interventions and that is why its implementation requires integration of disciplines, analyses and expertise, combining hydrology, hydraulics, ecology, chemistry, soil sciences, technology, engineering and economics to assess current pressures and impacts on water resources and identify measures for achieving the environmental objectives of the Directive in the most cost-effective manner. One of the reasons this has not happened is because the concept was almost hijacked by ecologists who with a reductionist conception of nature prevailing during the implementation, failed to understand what the WFD was designed to do (see paper on The Transition of EU Water Policy Towards the Water Framework Directive's Integrated River Basin Management Paradigm.</p>
<p>Sample the same locations repeatedly to provide comparative data year on year</p>

I would focus on collecting statistically robust dataset covering a range of parameters to help determine the status and pressures on surface water and associated biodiversity.
Trying to ensure the biodiversity/biological status indicators are adequate and truly reflect the ecological status
Making it genuinely focused on reporting on the status our the ecology.
Underpinning science linking ecological outcomes to pressures. Inclusion of nitrogen compounds, and phosphorus compounds other than PO4.
The one-out all-out rule.
Training staff to implement investigations and planning improvements, monitoring and data accuracy, implementing citizen science to be incorporated into investigations, to minimize the cost to regulators.
Firstly would be the frequency of updating classification, sampling and monitoring progress to ensure the reported data is up to date and most reflective of the current situation. It would then be the case of removing the one out all out process and determining what weighting should be given to the quality of the ecology (i.e. is it thriving), and the different limiting factors. This would likely and should be a statistical and data-driven process of determining these agreed by experts from a range of organisations (e.g. local authorities, eNGOs, Water companies, research institutions) and professions (e.g. water quality experts, ecologists, river restoration experts).
As well as presentational / communications aspects, perhaps on improving certainty around a) failures and b) reasons for failure. Many are 'suspected ' unknown' etc.
Simplifying the status so it is easier to understand why a river has the status it does and which bits it is failing on/doing well.
specific types of water body
Inclusion of nitrates. Linking to Habitats Directive
I would tear it up and start again
No Response

The final question in this section asked *Q50 Is there anything else you would like to add to help us accurately report your views on the current Water Framework Directive classifications or any proposed alternative?* This question was non-obligatory and 5 individuals declined to answer and 4 answered *No, None or N/A*.

The 50% who answered commented on a range of aspects (Table 15). Several expressed a hope that the WFD classification could lead to change for society biodiversity and ecology in general e.g., *be useful data that results in change on the ground that benefits the local ecology; Poor surface water health will undermine society health and food security a need to be realistic and achievable for society and promotes biodiversity and will enrich the lives of the local community.*

A few commented on the need for more stakeholder involvement e.g., *There needs to [be] much more local involvement in decision making to ensure that the measures selected are correct for the location area.*

Finally, one respondent remarked *It looks more complex and muddled than I had understood it to be, which is worrying.*

Table 15. Participants responses to Q50 Is there anything else you would like to add to help us accurately report your views on the current Water Framework Directive classifications or any proposed alternative?

<p>Any reporting of status needs to be able to inform interventions, there is no point in just reporting for the sake of reporting. It should be useful data that results in change on the ground that benefits the local ecology.</p>
<p>The indicators and evaluation processes should be scientifically robust and not provide loop holes to allow higher phosphates etc in urban areas or agricultural areas - they should accurately reflect what is happening, it is then for decision makers and other policies to determine how the surface water status impacts on actions taken in the catchment. Poor surface water health will undermine society health and food security.</p>
<p>Clean and plentiful water is useful for communicating this  River flow is a critical overarching determinant of outcomes  Biodiversity is important, but not species richness x diversity, rather how close to near-natural reference ecosystems the waterbody is  Water supply is obviously critical (for all kinds of purposes) - a 'triple challenge' approach where you seek to balance the food and other needs of people with reversing biodiversity lost and with keeping climate change to 1.5 C.  On the issue of scale and 'saving the Giant Panda' as you put it, one thing we do already have and should preserve is that we know the SACs &amp; SPAs - our most important sites - arguably SSSIs should be wrapped in, but obviously overlap is great. The water dependent sites which are protected by WFD with it's cross-reference to Habitats Directive, should be important among the environmental objectives, and therefore wider and/or more frequent monitoring of waterbody measures should support those objectives.</p>
<p>I don't believe it needs to change significantly, but it does need an overhaul and more input from stakeholders.</p>
<p>The WFD ignores additional benefits. Sometimes it is better not to pump a tonnes of carbon into the atmosphere and choose a solution that although less stringent promotes biodiversity and will enrich the lives of the local community. There needs to much more local involvement in decision making to ensure that the measures selected are correct for the location area.</p>
<p>Was useful to hear the concept vocalised that 'tackling P' (for example) should not be the focus, rather 'tackling the sources of P', such that other potentially-unknown stressors from wastewater / agri are dealt with at the same time. This conflicts somewhat with the approach taken under the Environment Act targets (and particularly the wastewater target) which could see single-issue solutions which don't do much for anything else...</p>
<p>It is well established that the lack of improvements in water status is down to the absence of appropriate measures developed through a process that requires the identification of significant pressures from point and diffuse sources of pollution, modifications of flow regimes through abstractions or regulation and morphological alterations, as well as any other pressures. The identification of significant pressures and their resulting impacts (which in turn lead to reduced status) are critical to the successful development of measures. Importantly, it is the WFD that recognises that "there is not going to be a single action for all water bodies that will improve</p>



biodiversity”, as different pressures are present in each body of water and different responses are required (see paper Water Framework Directive programmes of measures: Lessons from the 1st planning cycle of a catchment in England).

The overarching aims need to be more realistic and achievable for society - what 'quality' is an acceptable target?

It looks more complex and muddled than I had understood it to be, which is worrying.

## 7.3 Conclusion of section 3

Respondents scored five aspects of an alternative system. They supported (94%) a system which included reporting improving, stable or deteriorating trends and 56% supported a classification scheme where unbiased biodiversity (representative of that region/location) was the key indicator of success in a waterbody.

Most participants (89%) would not support a classification scheme based only on achieving targets for some chemicals and physical elements of concern nor a classification scheme based only on reporting the status of cherished organisms (78%).

There was a mixed reaction to the proposal to change the classification scheme to one based only on reporting the status of groups of organisms known to be sensitive to specific pressures (such as PO4 or ammonia).

There was no clear trend detected on where respondents would focus if they had the task of improving water quality with very many aspects mentioned. Several expressed a hope that the WFD classification could lead to change for society biodiversity and ecology in general.

## 8. Next steps

All participants to the event on 23 May 2024 will be send a link to this report after the stand-still pre-election period ending 4<sup>th</sup> July 2024. Participants will be invited to comment anonymously using the same software (JISC) as used to conduct the feedback during the event.

A total of 10 questions will be asked. In addition to the type of organisation/institute participants were affiliated with participants will be asked three question concerning the conclusions from each of the three sections. They will be asked if they agreed, partially agreed, or disagreed that the conclusions reported in section 1-3 were a fair conclusion to report from the data provided by participants and asked to elaborate on their response particularly if they disagreed or only partially agreed that the conclusions as written accurately reflected the participants views at the event. In addition, participants will be invited to add any other statement they feel have not yet been expressed related to questions in each section. The final question will be an open invitation to make any other comment related to the WFD, any alternative or the process of conducting this consultation.

# 9. Annex 1 Participant Information Sheet

**Defra funded research project examining the application of the EU Water Framework Directive and alternatives to better protect surface waters  
- Webinar 23rd May 2024**

**Thank you for considering participating in the forthcoming workshop.** The virtual interactive workshop will be structured around (i) formal presentations, and (ii) anonymous web-based questionnaire enquiring about your views. Participation in this study is voluntary. The study is completely anonymous, with all analysis to be conducted in the aggregate. This workshop is part of a Defra funded initiative to:

- Determine whether the WFD classification framework for ecological status/potential is designed and implemented in the best way to measure and assess the ecological health of the water environment.
- Determine whether the WFD framework is suitable to inform and direct action, including for the new Catchment Action Plans (CAPs).

There is an ambition to both better understand current ecological status and more importantly do better at targeting remediation measures to improve the state of our water environment. To support this ambition, we need to both review how we investigate the state of the water environment and consider whether we need new methods to drive forward improvement.

Your views are being sought on how best to interpret the environmental data we are getting and methods that might be more successful at driving improvement.

This *Participant Information Sheet* explains the procedure. Before you decide whether you wish to participate in the webinar, it is important that you read the information provided below. This will help you to understand why and how the research is being carried out and what participation will involve. Please contact Dr Jan Dick ([jand@ceh.ac.uk](mailto:jand@ceh.ac.uk) Tel. 0131 455 8578), who leads the sociology team, if anything is unclear or you have any questions. You can refuse and withdraw at any stage prior to submission when completing the anonymous survey.

## **1 Who is conducting the research?**

The UK Centre for Ecology and Hydrology (UKCEH) is responsible for obtaining views from a wide range of stakeholders related to the EU WFD. The UK project sociology lead is Dr Jan Dick, UK Centre for Ecology and Hydrology. The analysis of existing data and a proposal for a new classification is a UKCEH team led by Prof Andrew Johnson. While a team from Atkins Realis and James Hutton Institute led by Dr Greg Whitfield and Dr Ioanna Akoumianaki respectively will provide background literature review and strategy options.

## **2 Who is funding the research?**

This project has been funded by Defra.

## **3 What is the purpose of the research?**

Aims of this consultation are to understand the views of stakeholders including, industry, NGO's and environmental professionals on the EU WFD and the potential to amend following EU-EXIT.

## **4 Do I have to take part?**

No. Taking part in this knowledge sharing activity is completely voluntary and deciding to not take part will not disadvantage you in any way. You are free to attend and not provide feedback at any time without explanation or penalty. The best way to withdraw is simply to leave the meeting or not submit your questionnaire.

Please note that information from the survey will be anonymised and incorporated into a single report of all participants. Consequently, your views cannot be withdrawn after the survey is complete as Dr Dick will not be able to identify your contribution.

Given the ethical considerations of involving minors and obtaining parental consent the feedback will be restricted to individuals over the age of 18 on the day the survey is completed.

## **5 What will happen if I take part?**

Please see the accompanying protocol/agenda for the event. Essentially participating will entail scoring several features on a scale provided followed by an open question seeking to understand your views,

You will be asked to provide a numerical score for aspects related to your views on what you value in our surface waters, how you view the EU WFD and your responses to potential amendments. You will be asked about your thoughts and reasons for your selection. In addition, you will have the opportunity to share any other thoughts you may have. If participant quotes are used, they will not be attributable to a named individual.

## **6 Are there any risks in taking part?**

9.1.1 There are no risks to taking part, which the research team can foresee. The research team are not part of the regulatory agencies.

## **7 What are the possible benefits of taking part?**

There are no immediate direct benefits to taking part in this workshop; however, we hope the results as expressed in the survey results will feed into the deliberation of Defra policy going forward.

## **8 Will my taking part in this project be kept confidential?**

Yes – we will present the minimum, maximum and average scores of the participating stakeholders and summarise the main points raised without mentioning individuals. The workshop will be recorded, stored securely on a UKCEH website, and the link shared in the report, but participants are at liberty to switch off their camera and not speak so they cannot be identified, delivering their opinion only via the anonymous questionnaire. All written output will be anonymised to ensure no identifiable data is made public. There will not be any records linking your contributions back to your name or contact details. Further, most of the

survey questions are designed as categorical responses rather than explicit values, this is deliberate and a further design method to ensure anonymity of all participants. In other words, the survey is designed so that responses cannot be traced back to participants.

## **9 What will happen to the information I provide?**

The information you provide will be captured electronically in the survey software (JISC). The data will be securely stored on UKCEH computers accessible to only the project team, to support analysis of this co-production process. If you wish to withdraw your contribution, this must occur before you submit the survey. Once the report has been anonymised, it will not be possible to withdraw your contribution. An initial summary report will be produced and circulated to all registered attendees but not invitees (as they cannot comment on a process they did not attend). All feed back to the initial report will be documented via an anonymous process again utilising the JISC software and added to the report as an additional chapter enabling registered attendees to be sure their views are accurately reported.

## **10 Data Protection**

Any personal data that will be collected and processed in this study (e.g. organisation, role) are solely to enable reporting of the cohort of who completed the survey.

The UKCEH asserts that it is lawful for it to process your personal data in this project, as the processing is necessary for the performance of a task carried out in the public interest.

The UKCEH respects your rights and preferences in relation to your data. Please note that some of your rights may be limited where personal data is processed for research, but these occasions do not relate to this project. You can find more information concerning UKCEH Privacy Notice [here](#).

If you wish to complain about the use of your information, please contact the UKCEH's Data Protection Officer in the first instance (email: Quentin Tucker, Data Protection Officer [quetuc@ceh.ac.uk](mailto:quetuc@ceh.ac.uk)). If you remain unhappy, you may wish to contact the UKCEH Research Ethics Committee [ukcehrefsearchethics@ceh.ac.uk](mailto:ukcehrefsearchethics@ceh.ac.uk). You may also wish to contact the Information Commissioner's Office (<https://ico.org.uk/>

# 10. Annex 2 Snowball invitation

Email to webinar participants to invite other colleagues to contribute their views to the same questionnaire after viewing the recording of the webinar.

**From:** Yasmin Matthews <YasMat@ceh.ac.uk>

**Sent:** Friday, May 24, 2024 11:47 AM

**To:** Andrew Johnson <ajo@ceh.ac.uk>; Jan Dick <jand@ceh.ac.uk>

**Cc:**

**Subject:** Follow-up & Recording: Review of the Classification Framework for Ecological Status/Potential under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017

Dear Colleagues

Thank you so much for all your valuable inputs provided yesterday.

Should you wish to share the questionnaire to others within your organisation, please find enclosed the questionnaire and recording which explains the process with slides to help with the exercises. We are keen to get as many questionnaires completed as possible!

Webinar recording:

<https://ukceh-ac-uk.zoom.us/rec/share/WiC8Ku998nvx7aveQCeRq4sd95uVKvuxli8VCbF13C2nx-xvThOaJh556rb9kWw.duxp3-0LefmJK1TP>

Passcode: fEe=&X7j

Questionnaire:

<https://app.onlinesurveys.jisc.ac.uk/s/ceh-online-surveys/defra-eu-wfd-duplicate-1>

(If anyone encounters access issues please let us know.)

In a separate email we'll send a copy of the slides with a caveat on distribution.

**Warm Regards,**

**Yasmin Matthews (she/her)**

**Senior Scientist Support Administrator & Commercial Training Support Officer**

UK Centre for Ecology & Hydrology – Wallingford, NF8

T: +44 (0)1491 692641

# 11. Annex 3 Invitation to the webinar

Invitation to a stakeholder consultation

2 pm Thursday 23<sup>rd</sup> May Webinar

## **Review of the Classification Framework for Ecological Status/Potential under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017**

Project RDE511 (C21370)

### **Providing your/your organisation's views via an anonymous questionnaire whilst taking part in an interactive forum**

This project has been let by Defra to a consortium led by UKCEH and includes Atkins Realis and James Hutton Institute, it is led by Prof. Andrew Johnson.

The main purposes of the exercise will be for:

- You to tell us what you value most highly about English surface water bodies (and wish to protect).
- We reveal the data behind the current classification framework and consider what it appears to be telling us or not telling us about our water bodies.
- To get your response to proposed alternative monitoring/classification systems that might better reflect biodiversity outcomes as well as different evidence-led methods to identify what is limiting improvements.

The project team believe that collecting the views of a range of stakeholders, such as those who currently care for, manage, and/or simply appreciate our water bodies would greatly assist this research and lead to enhanced evidence for improved environmental regulations.

#### AGENDA

Timing	Activity
14.00	Introduction to how the Webinar will work
14.15	Introduction to the project
14.30	You tell us what you value most about our surface waters (and needs protecting)
14.45	UKCEH present an analysis of what 10 years of data from the WFD is telling us about our surface waters
15.15	You tell us what you most like or dislike about the WFD
15.30	Break
15.45	UKCEH offer some alternative monitoring/classification systems
16.00	You give your evaluation of these alternatives
16.30	You raise outstanding issues from your perspective
17.00	Close

# 12. Annex 4 Additional responses

## 12.1 Summary

Two additional responses were submitted after the webinar in response to the open invitation for webinar participants to distribute the questionnaire to colleagues.

It is difficult to draw conclusion from two responses particularly when they frequently expressed different views. However, its noteworthy that they did agree some aspects echoing the conclusions from the analysis of the webinar responses:

- they prioritised protection of biodiversity attributes,
- they liked the holistic aspect of the current WFD
- they were confident they understood the meaning of ecological status in relation to the WFD
- they agreed that all elements should be measured at every site
- they agreed that monitoring sites should be fixed.
- they agreed that despite fish abundance being stable for 30 years and fish richness increasing that things are still going wrong for the fish population of England
- agreed they supporting an alternative system which included reporting improving, stable or deteriorating trends and a classification scheme where unbiased biodiversity (representative of that region/location) was the key indicator of success in a waterbody
- they considered better implementation and funding was required.

Unlike respondents at the webinar both respondents were in favour of the 'One out all out' principle and feared a dropping of standards if abandoned.

## 12.2 Introduction

Further opinions were sought following the webinar using a snowball approach (Annex 2) whereby the team encouraged respondents to share with peers that might be interested in the topic, i.e., invitees invite others.

Two responses were submitted one on 24<sup>th</sup> May and the other 28<sup>th</sup> May 2024. Both self-identified as affiliated to an NGO.

The results are presented without averaging as it is felt with only two responses it is more accurate to present the raw data.

## 12.3 Section 1 - What participants valued

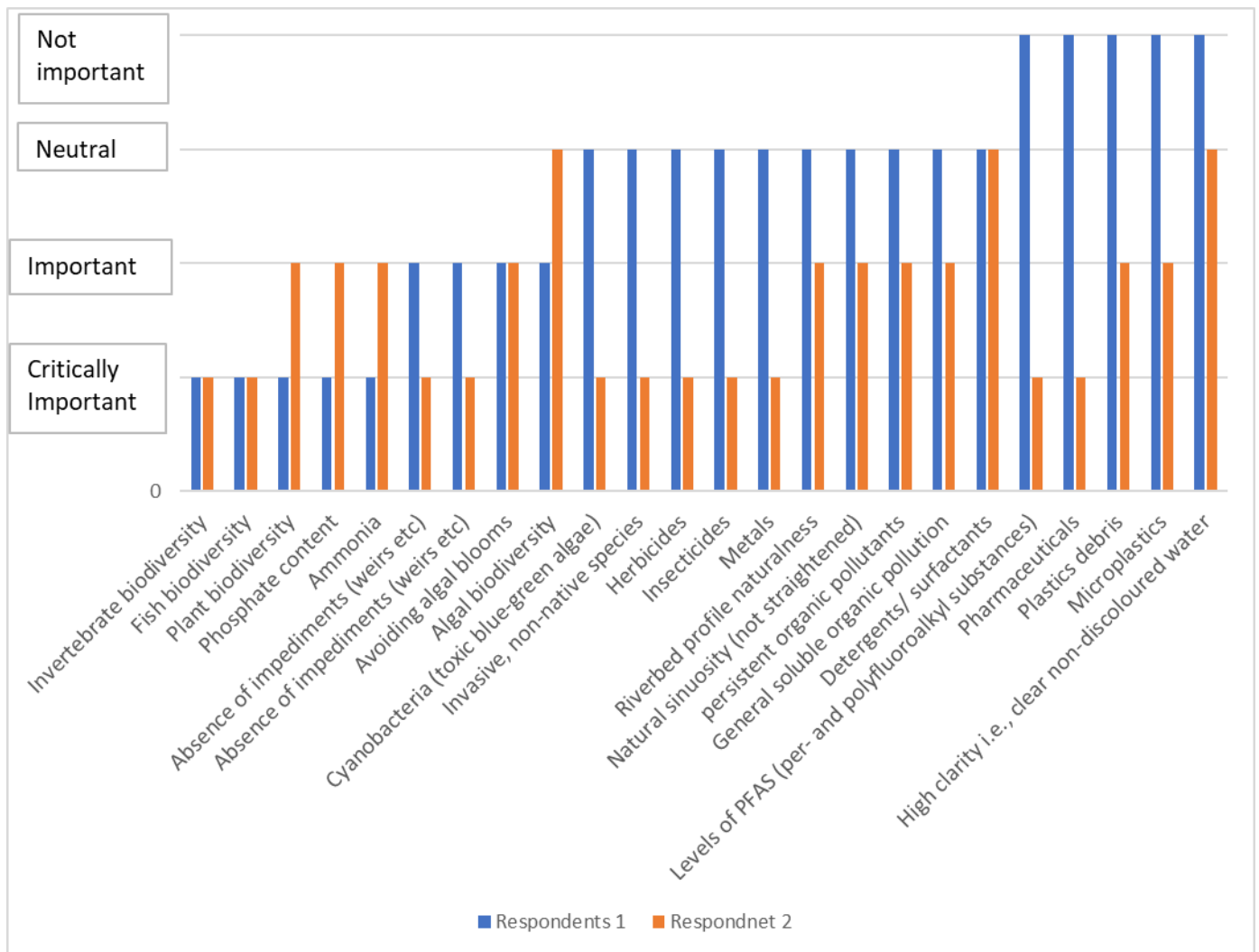
### Attributes of surface water

In response to the first question which was written as: *"You tell us what you value most about our surface waters, including artificial and heavily modified water bodies i.e. which attributes of surface water do you most wish to protect and which chemical elements, at*



current levels, do you believe represent the biggest dangers, if any, to wildlife? Please click the option which best represents your thinking". The two respondents scored the 23 common attributes listed, on a four-point scale from critically important to not important (Fig 1).

They both scored the biological aspects (i) Invertebrate biodiversity, (ii) Fish biodiversity and (iii) Plant biodiversity as critically important as did most of the participants attending the webinar (section 5.1). Both also considered phosphate content and ammonia as important or critically important similar to the webinar participants but respondent 1 scored insecticides as neutral while most webinar participants considered this stressor important. In general respondent 1 scored more aspects as neutral or not important compared with respondent 2.



### Specific species

Both respondents offered opinions (Table 1) on Q24 *Do you have a specific species that should be a focus for protection?* They recommended a focus on BAP species or Atlantic salmon and eels

Table 1 Responses to Q24 *Do you have a specific species that should be a focus for protection?*

More focus should be put on BAP species.
Atlantic salmon, eels

**Other information respondents considered important when valuing surface water**

Both responds offered opinions (Table 2) to this question. One stressed the important of the one out all out approach and the other consider urged a focus on endangered species.

Table 2 Responses to Q25 *Please elaborate and provide any other information you consider important when valuing surface water.*

We should continue to look at the water environment holistically and not move away from one out all out.
These are the 2 fish species that are classified as endangered. Improving the situation for these species would indicate improving water bodies. The issues around them are complex and would require a multi government agency / NGO and community response

## 12.4 Section 2 - Views on current WFD Ecological Status Classification

Both responds echoed views expressed by webinar participants concerning what they most appreciated (Table 3) about the current Water Framework Directive classification. They liked the holistic approach.

Table 3 Responses to Q26 *What do you appreciate most (most valuable) about the current Water Framework Directive classification?*

Holistic, all elements have the same weighting.
It is important to remember that this is a Framework Directive that incorporates other Directives / Regulations with regards to freshwater (e.g. Floods / Priority Hazardous Substances) therefore it provides a holistic approach to freshwater management when implemented by member states correctly. Important is the emphasis on engagement with local communities which is often over looked

Like the webinar responses there was no consensus on the aspects they most disliked about the WFD (Table 4). One respondent be moaned the lack of monitoring guidance while the other disliked the lack of linkage to other EU directives.

Table 4 Responses to Q27 *What do you dislike most (most unhelpful) about the current Water Framework Directive classification?*

Lack of guidance around the monitoring required.
It does not link sufficiently with the Marine Strategy Directive or the Invasive Alien Species Regulation although work has started on this at European Commission level as this has been accepted as an issue. Whilst Climate Change is not specifically recognised under WFD new guidance is being published. Also the way that member states abuse derogations although post 2027 these are largely removed.

**Scale of interest**

Unlike the webinar respondents the majority of whom reported they were interest in WFD results at multiple scale One respondent was interested at the catchment scale while the other selected the catchment scale. Neither respond was interested in WFD results at the district or national scale.

**Confidence in personal knowledge of what ecological status means in the WFD**

Both respondents were confident they understood the meaning of ecological status in relation to the WFD which was confirmed by their answers to the accompanying narrative question (Table 5).

Table 5. Responses to Q30 which asked, *‘Please elaborate and explain what you consider ecological status means in the WFD’* by respondents response to Q29 *‘Are you confident you know what ecological status means in the WFD?’*

How healthy is the natural environment. How damaged has it become from human activities.
The difference between WFD and, for example UWWTD, is that the end point is the impact on the ecology

**One out all out**

Both respondents were in favour of the ‘One out all out’ principle and feared a dropping of standards if abandoned (Table 6).

Table 6. Participants elaboration of their response to Q31 *‘Do you agree that a failure in one individual element, such as a chemical, should prevent a waterbody being designated as good ecological status (good potential in the case of A/HMWB) even if all biodiversity elements were at good status (One out all out)?’*

If we move away from one out all out we may as well not bother with overall classifications as they will be meaningless.
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This is a political answer as opposed to scientific. OAO has been debated endlessly at Commission / member state level, some member states view this principle as inhibiting treasury functions from funding WFD due to uncertainties in reaching good within set time scales and would prefer it to be removed. However the danger here is that I know that some member states would abuse this by reaching good in some chemical standards and then ignore everything else.

## Data discovery

Both respondents reported they had tried to discover which specific element was leading to the failure to reach good status at the local or other scales. One reported it was difficult while the other selected the fourth option i.e. they had not tried.

Table 7. Participants combined responses to Q33. *Have you ever made efforts to discover which specific elements are leading to the failure to reach good status at the local or other scales?* And Q34. *If so, did you find it easy to discover which specific elements are leading to the failures to reach good status?*

Simplicity of discovery	Attempted to discover element leading to failure to reach good status		
	Yes	No	Not sure
Easy	0	0	0
Difficult	1	0	0
Impossible	0	0	0
Not tried	1	0	0

## All elements monitored at all sites and fixed monitoring sites

Both respondents answered in the affirmative that all elements should be measured at every site and monitoring sites should be fixed.

One respondent considered significant monitoring should be funded (Table 8) while the other declined to answer considering out with their experience.

Table 8 Participants responses to Q38 *which asked How many monitoring sites would you suggest are needed across England and please explain to help us understand your suggested number of monitoring sites?*

Approximately 20000. There should be monitoring in each waterbody for Fish, phys chem, inverts, and MPC.
Not within my expertise

## PO4

One of the respondents was unsure if PO4 levels are causing significant damage to river ecosystems explaining it was out with their experience. While the other answered in the

affirmative and explained that PO4 causes eutrophication which damages all biological elements (Table 9).

Table 9 Participants responses to Q40 which asked respondents to elaborate on Q39 *PO4 is flagged in our WFD results as a major factor preventing good status. Do you feel that PO4 levels are causing significant damage to river ecosystems?*

PO4 causes eutrophication, low oxygen levels are damaging to all biological elements.
Not within my expertise

### **Fish population**

Both respondents felt that despite fish abundance being stable for 30 years and fish richness increasing that things are still going wrong for the fish population of England. One respondent echoed the views expressed by participants at the webinar that physical barriers and lack of recruitment were problems while the other reiterates the need to focus on specific species such as Atlantic salmon and eels.

Table 10 Participants responses to Q42 which asked respondents to elaborate on Q41 *Although fish abundance has been stable for 30 years and richness has increased nationally, the WFD results flag up many locations as not having the right community present. Do you feel things are going wrong for our fish populations?*

Lack of funding to address fish barriers alongside reduced salmonid recruitment spells for disaster!
See previous comments re Atlantic salmon and eels

## **12.5 Section 3 - Views on altering a surface water classification system**

### **Elements worthy of support in an alternative classification system**

Similar to respondents attending the webinar both respondents agreed they would or might support a system which included reporting improving, stable or deteriorating trends (Table 11) and a classification scheme where unbiased biodiversity (representative of that region/location) was the key indicator of success in a waterbody.

There was no consensus between the two responses to the other three proposed alterations to the WFD.

Table 11 Respondents level of support for various suggested alterations to the current WFD classification scheme.

Question	Strongly support	Support	Might support	Would not support	Don't know
Would you support a system which includes reporting improving, stable or deteriorating trends?	1	1			
Could you support a classification scheme where unbiased biodiversity (representative of that region/location) is the key indicator of success in a waterbody?	1		1		
Would you support a classification scheme based only on reporting the status of groups of organisms known to be sensitive to specific pressures (such as PO4 or ammonia)			1	1	
Would you support a classification scheme based only on reporting the status of cherished organisms such as dragonflies or salmon?		1		1	
Would you support a classification scheme based only on achieving targets for some chemicals and physical elements of concern		1		1	

In response to the question Q48 (Table 12) one respondent answered positively highlighted the indicators they considered important which echoed the webinar participants while the other considered they were not qualified to comment.

Table 12 Responses to Q48 *Would you support a scheme which has a mix of several different quality and biodiversity indicators, if so which?*

Fish, phys chem, inverts, and MPC.
Not qualified to comment

### Focus of improving the WFD classification

One respondent considered increased monitoring was required and should be the primary focus of an improved strategy while the other considered they were not qualified to comment (Table 13). Both respondents considered better implementation and funding was required (Table 14).

Table 13 Participants responses to Q49 *If you had the task of improving on the current WFD classifications, where would you focus?*

I'd actually do some monitoring, we are currently classifying some waterbodies using data over 10 years old!
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Not qualified to comment
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Table 14. Participants responses to Q50 *Is there anything else you would like to add to help us accurately report your views on the current Water Framework Directive classifications or any proposed alternative?*

Proper funding prioritisation of the current system would go a long way
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Better implementation
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