

LINK Consultation Response

Implementing the Water Environment and Water Services (Scotland) Act 2003:
Updating environmental standards for the water environment



Scottish
Environment
LINK

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Scottish Environment LINK welcomes the opportunity to comment on the consultation on Updating environmental standards for the water environment, in relation to the implementation of the Water Environment and Water Services (Scotland) Act 2003. Our responses to the questions posed in the consultation are as follows:

1. Do you agree with the proposal in Section 4 to update the river fish statistical assessment method?

Yes.

Deciding how multiple data-points for a single site or waterbody should be combined to give a representative annual number is not always straightforward. If there are enough data-points, then a percentile figure may be most appropriate. That is the approach adopted by UKTAG for other variables such as dissolved oxygen, but for this application to fishery quality, there will never be enough data-points for that to be viable. UKTAG has also used geometric means for other variables, but that has apparently not been considered for this application. The existing Bayesian approach has only been compared against taking a simple arithmetic mean.

The worked examples given have presumably been chosen to make using the arithmetic mean look more 'appropriate' than the Bayesian approach. The source documents don't indicate how many of the 21 overall downgradings to less than good that the currently proposed change will give 'feel right' to the biologists with a detailed knowledge of the waterbodies concerned. No information on this is provided. It is also not revealed how many of the 43 downgradings from 'high' to 'good' will result in an overall classification downgrade. Would taking a geometric mean instead (as is done for P) result in fewer changes or look more rational when compared against other measured variables?

Despite this absence of relevant information, Scottish Environment LINK has no objection to the proposal. It is revealed that for the small proportion of waterbodies considered in Table 4.1, an additional 14 waterbodies will be classified as less than good status, and hence requiring consideration of regulatory corrective action.

2. Do you agree with the proposal in Section 5 to update the river phytobenthos assessment method?

Yes.

This method change was not included in the UKTAG consultation undertaken last year. It is described in a later UKTAG document which was apparently not subject to consultation. Many more Scottish river phytobenthos samples will have been analysed since the DARLEQ software was first introduced, so it is unsurprising that species scores can now be refined.

DARLEQ software is a 'black box' algorithm adjusted to give desired EQR numbers. If the numbers produced don't 'look right' then the inputs can be adjusted to give a better-looking output, and this is what is proposed with the current change from TDI 14 to TDI 15LM. It is good that there is no suggestion at this stage that any cognisance should be taken of TDI 15NGS scores, though that method development should still be pursued.

At least for the suite of site results included in the current consultation, readers are told that the species score tweaks proposed to be introduced by TDI 15LM will result in only few and minor classification changes. Hopefully someone has looked at the proposed changes, and feels that they 'make sense', though readers are not informed of this.



It is noted that introduction will result in the downgrading of a currently 'high quality' waterbody.

3. Do you agree with the proposal in Section 6 for a new loch fish (eDNA) assessment method?

Yes.

This proposed method was not included in the 2019 UKTAG consultation, but is outlined in a later document. It is noted that it has not been intercalibrated, and that with the UK's withdrawal from the EU and hence ECOSTAT, that will not now be possible, so some question about the appropriateness of the calibration of the algorithm used to generate the EQR must remain.

The current situation of having no loch fish classification in Scotland is undesirable (and contrary to the requirements of the WFD). The potential introduction of proposed new eDNA methodology is very welcome, progressive and exciting. The UKTAG document indicates that implementation of the proposed method (using the limited current data) for 43 Scottish lochs would result in 4 of them, including Lochs Affric and Eilt) being given a lower overall quality status. Wider application would presumably result in more overall quality downgradings but, where each metric has an element of uncertainty, that is inevitable as more metrics are included in an 'one out, all out' overall assessment as currently used.

4. Do you agree with the proposal in Section 7 to update the loch morphology bank protection assessment method?

Yes.

There appears to have been no prior consultation or information provision about this proposed change. The initial MImAS scheme was essentially a 'stop-gap' method introduced in the absence of adequate data on the true impact of different aspects of bank protection on ecological quality. As indicated in the consultation document, it has since been found that it significantly over-estimates ecological harm caused. The proposed change to give consideration to actual ecological aspects of bank protection is welcome.

Where hard protection has been proven to be absolutely essential, Scotland needs a scheme which promotes construction at a sufficient distance from the water so as to not harm natural physical and ecological processes. The proposed change clearly seeks to do that, but in the absence of any relevant data, it is unclear as to whether or not it may succeed. As indicated in the consultation, its effects will have to be monitored so that assessment of the effectiveness and appropriateness of the new classification proposals can be carried out in due course.

5. Do you agree with the proposal in Section 8 to the introduction of spatial standards for fish barrier assessment?

No.

This proposed substantial relaxation of the river continuity standard was not included in the 2019 UK TAG consultation. The 'Sniffer' document referred to in the UKTAG 'Guide to River Continuity 2015' document, which describes the current WFD111 methodology manual unfortunately can apparently no longer be accessed. Attempts to use the link provided all failed.

Despite the passage of time since the method was published, it is unfortunate that no data is presented to demonstrate any link between barrier status outcomes determined by using the preferred 'Fish Population survey method' (2.1 in the UKTAG guide) and alternative 'WFD111 coarse-resolution method' (2.2 in the UKTAG guide) which is just a 'desk study' and doesn't use actual fish population assessments and which the guide admits "has not yet been ground-truthed".



The current proposal changes the way the output from the method 2.1 or 2.2 determinations is actually applied. It is inevitable that the proposed relaxations will lead to status upgrades and the data provided shows the likely extent of these upgrades.

The way waterbodies are defined for the purposes of the WFD already excludes very many minor waterbodies and ponds, which are therefore relatively unprotected and liable to degradation without any recognition of this deterioration. The current proposal extends this lack of protection to the fisheries potential of smaller streams which, if the proposed change is introduced, will presumably no longer be monitored for their fisheries populations. The proposed change to further reduce the protection afforded to smaller/minor waterbodies would therefore be a retrograde change.

6. Do you agree with the proposal in Section 9.1 to update river flow standards to include artificially increased flows in high hydrological status waterbodies?

Partly. The two parts of this proposed change need separate consideration. The purpose of the WFD is to protect the ecology, not the flow regimes of waterbodies. Flow is a 'supporting element' which may be an indicator of potential ecological change. Thus, as para 2.29 of the UKTAG report reminds us, Scotland's current ecological quality indicators do not map against flow changes sufficient to give class changes judged by hydrologists to potentially distinguish between High, Good and Moderate status waters. Thus, in real rivers, the quality of ecological assemblages do not vary between High, Good and Moderate in response to hydrological regimes which hydrologists consider to represent High, Good and Moderate status.

The flow standards are useful primarily because flow is much more cheaply measured (or estimated by desk study) than the collection and analysis of samples for a full suite of ecological quality indicators.

To protect river ecological quality and continuity, particularly in smaller headwaters, it is necessary to protect low-flow (Q95) conditions, so downgrading if low flows are significantly reduced is justified. Equally, these low (<Q95) flows are important in facilitating specific ecological processes within the faunal and floral assemblages. (eg, upstream penetration of invertebrates, plant 'seeds' and diatoms, and the settlement and establishment of larvae and 'seeds'), so low flows should not be consistently raised to the extent that these processes would be inhibited. The proposed downgrading on the basis of an artificial raising of flows at Q95 and below is therefore supported.

However, it is disappointing that nowhere in the UKTAG guidance, or Government proposals, is any mention made of the effects of climate change on river flow regimes. SEPA (and SNIFFER) have gathered extensive evidence clearly demonstrating long-term changes in river flow regimes of the same magnitude as the standards now proposed. This raises the question that, where long-term flows have changed by more than the +/-5% or +/-10% proposed here as new standards, should rivers lose their 'High' status if e.g. their long-term stage flows during 1990-2019 are now shown to vary by more than +/- 5 or 10% from their 1960-1989 long-term average?

With the exception of temporary 'washout' effects during extreme high-flow events, the long-term change in flow rates which may be ascribed to climate change are more likely to be ecologically significant at low flows, rather than high flows. Over course of time, natural unconstrained waterbodies will modify their own morphology to accommodate increased flows, as they will have done in response to the climate change induced flow changes already endured. By definition, a high status river must not have an unnaturally constrained channel.



7. Do you agree with the proposal in Section 9.2 to update river flow standards to allow for short term flow deviation?

Insufficient information is presented. The purpose of the flow standards is to enable (abstraction) licence conditions to be set which will (probably) protect the ecological status of waterbodies. Hydrology is a supporting element, but is here being used as an ultimate arbiter, without reference to ecological information. Nowhere in the consultation document is any evidence presented to demonstrate that this proposed relaxation of standards will provide the necessary protection to the relevant waterbodies.

All that is needed is some real monitoring evidence from rivers which are abstracted and have had one or more of their biological quality elements monitored. If their measured status (in absence of other confounding pressures) is shown to be at least as good as that predicted by the matrices in Table 9.2 of the consultation document, then the supporting hydrological standard can be judged to be probably adequate. Real data from just a few monitoring sites would provide useful evidence. Such data must exist, and it is therefore very disappointing that it is not presented.

Given the total absence of any biological information, no conclusion can be drawn regarding the acceptability of the proposal to allow temporary relaxation of the standards.

It is noted that the consultation document does recognise the crucial importance of connectivity along a watercourse, and that flow rates must not be reduced too rapidly, so as to avoid stranding. These aspects are agreed.

The separate technical annex to the May 2019 UKTAG consultation does refer to an element of 'conceptual understanding' being relevant to the certainty of the realism of the Table 9.2 projections, and that has to be agreed. It is also encouraging that a literature review was undertaken, but it is nevertheless still somewhat concerning that many waterbodies are downgraded purely on the basis of their theoretical flow unnaturalness, which is unrelated to any measurable impact on river ecology using all the currently available methods.

8. Do you agree with the proposal in Section 10 for a new nitrogen standards for lochs?

Yes.

It is easy enough to accept these proposed additional new nitrogen standards for lakes. The need for them has been debated for many years, but there was always a absence of evidence that they would add value to the available suite of regulatory controls. Nitrogen and phosphorus are both essential plant nutrients. The lack of definitive evidence arises substantially because of the effectively invariable co-variance of nitrogen and phosphorus in freshwaters, as they often come from the same source. It is also relevant that when the environmental N:P ratio varies from the 15:1 (atomic) cell requirement ratio, then aquatic plants have evolved mechanisms to adjust their cell metabolism to cope with a significant range of N:P availability. Thus the rate of growth algae and plants is relatively insensitive to a wide range of environmental N:P concentrations.

Both elements play a significant role in the eutrophication process, but as they generally arise from the same sources, the consultation document suggests that little new regulatory action may be required.

Currently, only a small proportion of Scotland's lakes are monitored for Total Nitrogen (TN), and as samples from more of the more contaminated lakes are analysed for TN, it is most probable that new quality downgradings will arise. The consultation document does briefly mention that it is inevitable that adding another parameter to the list of 'one-out, all-out' standards to be met, will lead to the new downgrading of some waterbodies.



The new standard may be particularly useful to alert authorities to specifically high nitrogen sources (ie very high N:P ratio), such as run-off from chicken manure, which should hopefully lead to welcome new regulatory action.

9. Do you agree with the proposal in Section 11 to update the invasive non-native species list?

Yes for the additions. Further consideration should be given to the removal of *Elodea canadensis*.

The reasoning for the additions which is presented by GBNSS is sound enough and is agreed. In respect of *Elodea canadensis*, there is no dispute that it is both non-native and invasive. The question is whether it has a moderate or major impact.

GBNSS assess that across GB as a whole, it has only moderate impact. However, large parts of Scotland are still free from this species, and its further spread should be considered undesirable. Maintaining its presence on the list of high impact species would help in preventing its further spread.

Ponds and minor watercourses are unfortunately neglected by WFD derived controls because they are too numerous and too small, however they are crucial to the breeding success of many amphibians and often support a unique assemblage of aquatic plants and invertebrates. It is here that the threat of *Elodea canadensis* is perhaps greatest. To quote from the GBNSS risk assessment summary sheet, this species "Forms dense stands which displace other aquatic plants, block light and produce anoxic conditions in the water." In small waterbodies the colonisation of *Elodea canadensis* could be catastrophic for the flora and fauna found there.

This response is supported by the following LINK member organisations:

- Badenoch and Strathspey Conservation Group
- Buglife Scotland
- Fidra
- Froglife
- Plantlife Scotland
- Scottish Wild Land Group
- Scottish Wildlife Trust
- WWF Scotland

Scottish Environment LINK is the forum for Scotland's voluntary environment community, with over 35 member bodies representing a broad spectrum of environmental interests with the common goal of contributing to a more environmentally sustainable society.

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