



**Policy Summary of
Guidance Document n°31**

**Ecological flows
in the implementation of the
Water Framework Directive**

Why this guidance

Building on an assessment of progress in Water Framework Directive (WFD) implementation in its 1st cycle, the Blueprint¹ to safeguard Europe's water resources stressed the urgent need to better address over-abstraction of water, the second most common pressure on EU ecological status, and to recognize that water quality and quantity are intimately related within the concept of 'good status'. This would require an EU-wide acknowledgement of the ecological flows, i.e. the "*amount of water required for the aquatic ecosystem to continue to thrive and provide the services we rely upon*". To achieve this, the Blueprint proposed the development of a guidance document in the framework of the WFD common implementation strategy (CIS) that would provide an EU definition of ecological flows and a common understanding of how it should be calculated, so that ecological flows may be applied in the next cycle of river basin management plans (RBMPs) due for adoption by the end of 2015.

What this document covers (and does not)

This document is intended to support a shared understanding of ecological flows (Eflows) and ways to use them in the RBMPs. To that end, it covers a working definition in the context of the WFD. Secondly, it provides an overview of the steps in the WFD cycle where Eflows play a role. Thirdly, this document draws upon lessons learned from practices that Member States already carry out in this field and provides information on methodologies, monitoring, measures and evaluation concerning Eflows.

This document does not offer a full protocol for the implementation of Eflows in water bodies, nor is it intended to lead to uniform implementation of Eflows. Member States are encouraged to make best use of the shared understanding of Eflows in all steps of the WFD process. The site-specific Eflows implementation might also take into account other aspects like national or regional legislation, specific environmental values or ecosystem services, while at the same time respecting the obligations under the WFD, Habitats Directive and other EU Directives and international commitments (World Heritage, Ramsar Convention...).

Alternative flows consistent with good ecological potential or with the exemptions in article 4 of the WFD could take into account considerations of disproportionate costs and sustainable human development activities.

Flow requirements of aquatic ecosystems

WFD provisions acknowledge the critical role of water quantity and dynamics in supporting the quality of aquatic ecosystems and the achievement of environmental objectives.

This link has received quite a lot of attention in the scientific literature developed over the 3 last decades. The recognition that the hydrological regime plays a primary role in determining physical habitats, which in turn determines the biotic composition and support production and sustainability of aquatic ecosystems, is well documented. Beyond the sole consideration of minimum flows in dry periods, this knowledge base stresses the need for all flow components to be included as operational targets for water quantitative management from base flows (including low flows) to flood regime (magnitude, frequency, duration, timing and rate of change).

¹ COM(2012) 673

A working definition of ecological flows for WFD implementation

In the context of this Guidance, the Working Group adopted the term of "ecological flows" with the following working definition:

Ecological flows are considered within the context of the WFD as "an hydrological regime consistent with the achievement of the environmental objectives of the WFD in natural surface water bodies as mentioned in Article 4(1)".

Considering Article 4(1) of the WFD, the environmental objectives refer to:

- non deterioration of the existing status
- achievement of good ecological status in natural surface water body,
- compliance with standards and objectives for protected areas, including the ones designated for the protection of habitats and species where the maintenance or improvement of the status of water is an important factor for their protection, including relevant Natura 2000 sites designated under the Birds and Habitats Directives (BHD)².

Where water bodies can be designated as heavily modified water bodies and/or qualify for an exemption, related requirements in terms of flow regime are to be derived taking into account technical feasibility and socio-economic impacts on the use that would be affected by the implementation of ecological flows. The flow to be implemented in these water bodies is not covered by the working definition of ecological flow and it will be referred distinctively. These latter flows are to some extent addressed in the guidance document.

Recommendations for implementing ecological flows in the WFD process

These recommendations consist in the collection of all "key messages" of the guidance document which are listed at the start of chapters 3 to 8.

A gradual and incremental consideration of the recommendations in this guidance is expected from Member States in their implementation of WFD. This document was developed with Member States in the year before the finalisation of their draft RBMPs for the 2nd cycle. Member States are expected to consider the extent to which the recommendations in this guidance can be included in these RBMPs before their adoption in December 2015, and in subsequent planning steps such as the review of the monitoring programmes, in making operational their programmes of measures by December 2018 and in the implementation of measures all along the 2nd cycle. Obviously full consideration of some recommendations (e.g. about the Pressures and Impact analysis addressed in chapter 4) will be only possible when preparing the third cycle.

Setting the scene

- The Water Framework Directive, as well as the Birds and Habitats Directives, set binding objectives on protection and conservation of water-dependent ecosystems. These objectives can only be reached if supporting flow regimes are guaranteed. The

² Directives 92/43/EC and 79/409/EEC

establishment and maintenance of ecological flows, in the sense used in this document, is therefore an essential element in meeting those objectives. Therefore consideration of ecological flows should be included in national frameworks, including binding ones as appropriate, referring clearly to the different components of the natural flow regime (and not only to minimum flow) and the necessity to link their definition to biological requirements according to the objectives of WFD and BHD; exemptions should be justified in accordance with the ones of the WFD.

- It is recommended that these frameworks include means to ensure effective implementation of ecological flows, e.g. binding the strategic planning for development of impacting uses (e.g. irrigation, hydropower, navigation, flood control...) and the permitting process.

Eflows in status assessment and environmental objectives

- Assessment of the hydrological regime is explicitly required by the WFD when assigning high ecological status.

- For other status classes, classification of ecological status must rely on biological methods sensitive to all existing pressures, in particular to hydrological ones. Classification of a water body subject to significant hydrological pressures using only biological methods that are not appropriately sensitive to hydrological alteration may result in an overestimation of the ecological status that would not be in line with the WFD. In case such methods are not available yet, Member States should urgently develop them, providing metrics more specifically sensitive to hydrological pressures taking into account the relationship between hydrology, morphology and the biological impacts. Evidence of severe hydrological alteration should trigger appropriate monitoring (operational or investigative) and action to significantly mitigate the impact.

- The definition of ecological flow should encompass all environmental objectives in article 4(1) (non-deterioration, achievement of GES, meeting specific requirements of protected areas where relevant).

- The maintenance of the conservation status of water-dependent habitats and species protected under the Birds and Habitats Directives may require flow conditions which are different or go beyond the one required for the achievement of GES or maintenance of HES. These specific requirements should be identified and considered in the implementation of the different steps of WFD.

Assessment of hydrological pressures and impacts

- Article 5 analysis should carefully assess the significant pressures altering the flow regime which result in an impact on biology likely to contribute to the failing of environmental objectives.

- Ecological impacts of hydrological alterations and their significance should be ultimately assessed with biological indicators built on monitoring data that are specifically sensitive to hydrological alterations.

- In case the available biological metrics do not detect hydrological pressures or are not specific enough to isolate their contribution to the overall impact on the status, and because hydrological regime is well acknowledged as a key driver for river ecosystem quality, the evaluation of the significant impact of hydrological pressure can rely to a large extent on an assessment of hydrological alterations of the river flow.

- Most severe hydrological alterations can in many cases already be detected with some simple tools considering the extent of the pressures or the spatiotemporal alteration of habitats.

Establishment of monitoring programmes

- Proper definition and efficient implementation of ecological flows require a significant amount of hydrological data derived from monitoring the hydrological regime; modelling approaches may to some extent supplement insufficient monitoring data.
- Monitoring programmes should be adapted to provide an improved picture of hydrological alterations and their impact on habitat/morphology and biology and to effectively support the achievement of ecological flows.
- Sufficient hydrological information should be collected to enable estimation of the current flow regime and how it deviates from the natural flow regime.
- The development of operational hydrological monitoring should relate to the surface and groundwater hydrological pressures and be prioritised where action is likely to be needed.
- The integrated monitoring of hydrological, morphological and biological quality elements will enable the estimation of the effectiveness of flow restoration action as part of the programme of measures.
- The first step to address climate change is to know how hydrology is affected and evolves in the long-term; hydrology included in the surveillance monitoring will inform about the long-term evolution of natural flow regime.

Defining ecological flows and analysing the gap with the current situation

- To be consistent with the environmental objectives in article 4(1), the definition of Eflows should be the result of a technical/scientific process with no consideration of the associated socio-economic impacts. These latter impacts should only be considered when deriving the flow regime to be implemented in HMWB or water bodies subject to an exemption, consistent with the conditions set by the WFD.
- Many methods have been developed and may be used to inform the definition of Eflows, mostly differing in terms of integration of biological aspects, scale, complexity and volume of required data.
- The selection of the most appropriate method depends on resource availability (incl. monitoring data) and on the severity in the pressures. Purely hydrological methods may be a reasonable approach to cover the whole river basin; a more detailed approach will be needed to take specific actions, potentially affecting the socio-economic uses, to ensure their effectiveness.
- In cases where hydrological alterations are likely to prevent the achievement of environmental objectives, the assessment of the gap between the current flow regime and the ecological flow is a critical step to inform the design of the programme of measures.

Measures for the achievement of ecological flows

- In order to achieve WFD environmental objectives in natural rivers, the programmes of measures (PoM) should ensure the protection of ecological flows and their restoration.
- Being part of the basic measures, controls on surface and groundwater abstractions, impoundments and other activities impacting hydromorphology form a strong basis to

protect and restore ecological flows, through the authorization process and regular review of permits.

- Many supplementary measures may be needed to support the achievement of WFD environmental objectives. In many cases, the combination of hydrological measures (ensuring the maintenance of ecological flows by all abstractions and regulation) and morphological measures (improving the aquatic habitats in order to make them less vulnerable to flow impairments) may be the most cost-effective approach.
- The PoM should support the development of knowledge on river ecosystem flow requirements both at large scale and at site level where appropriate.
- A careful assessment of costs associated with the implementation should be carried out to inform the selection of the most cost-effective measures or combinations of measures.
- These latter considerations shouldn't be used to revise the values associated with ecological flows which are to be derived from a technical / scientific process; they can however usefully inform the possible designation of the water body as HMWB or to apply for an exemption.

Heavily modified water bodies and exemptions

- Hydrological alterations without substantial change in morphology can in very specific circumstances justify the provisional designation of heavily modified water bodies (HMWB), which should generally only be based on the identification of a substantial change in morphology.
- Definition of ecological flow and identification of the necessary measures to deliver it and achieve GES should, where hydrology is significantly altered, be considered as part of the designation test for HMWB and justify that these measures cannot be taken.
- A careful assessment of the hydrological regime to be delivered should be carried out in the definition of good ecological potential together with the mitigation measures to improve the flow conditions; depending on the nature and severity of morphological alteration, the hydrological regime consistent with GEP may be very close to the ecological flows.
- Similarly an exemption under Article 4(5) can be justified with a significant hydrological pressure; this justification will require the definition of ecological flow and identification of the necessary measures to deliver it. The flow regime to be implemented in the water body should be the closest possible to ecological flow. When hydrology is not the cause for exemption, the hydrological regime should be as a default the ecological flow identified to support GES unless evidence can be used to set a different hydrological regime which supports the alternative objective.

Public participation

- Given their importance for the achievement of environmental objectives and the potential impacts of their related measures on users, participation schemes are particularly crucial for the achievement of ecological flows.
- Success will ultimately depend upon effective interaction with stakeholders, from politicians to local users, and the ability to communicate the need for ecological flows among those whose interests are affected.
- Public participation on Eflows should be developed in all the phases of the WFD planning process, from its design, implementation plan and effective implementation follow-up, ensuring the participation continues in subsequent planning cycles.