

A new approach for assessing minimum flow in ephemeral streams

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Abstract The aim of this paper is to propose a new methodological approach, appropriate for low-yielding catchments, by calculating the ecological minimum river flow starting from the river water quality based on biological indicators and physical–chemical characteristics as reported in the Italian Water Law no. 152/06 and in the UE 2000/60 Directive (WFD: Water Framework Directive). Actually, protecting and restoring river flow regimes and hence the ecosystems they support by providing environmental flows, has become a major aspect of river basin management. In detail, pollutant concentrations downstream and fluvial structure cross-sections have been evaluated, starting from discharges released downstream, and concentration values have been compared to the Italian Law threshold values. Then, the ecological minimum flow value has been assessed through a frequency analysis of events for which pollutant concentration values exceeded the legal threshold values. Finally, a validation of the proposed approach has been attempted by comparing results in terms of ecological minimum flow, to results of application of some empirical hydrological methods.

Key words minimum flow; ephemeral stream; habitat quality; river water quality