Estimation of environmental flows from an ecological engineering perspective.

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Environmental flow is the amount of water flow required to maintain the health of a river ecosystem. More than 200 methods have been proposed to estimate environmental flows. They, in general, are classified into four categories, namely the hydrological method, the hydraulic rating method, the habitat simulation method, and the holistic method. This study attempted to estimate environmental flows using the habitat simulation method. A stream reach was chosen for the study area, and physical habitat simulations for the target fish species were carried out. Habitat suitability curves and HEC-RAS model were used for the habitat simulations and hydraulic simulations, respectively. Results of estimated environmental flows were compared with those by the hydrological methods and the hydraulic rating methods. Results indicated that the hydrological method or hydraulic rating method can estimate inappropriate environmental flows for the target fish species in the study site.

Keywords : environmental flow, habitat simulation method, physical habitat simulation, habitat suitability curve, hydrological method, hydraulic rating method