

Considering mesohabitat scale in ecological impact assessment of sediment flushing



Benthic macroinvertebrates respond to several factors characterizing the physical habitats, as water depth, current and streambed substrate. Thus, anthropogenic disturbances altering these factors may have different effects on benthos, also depending on mesohabitats. These disturbances include sediment flushing operations, commonly carried out to recover reservoir capacity, and investigating their effects at mesohabitat scale could be relevant for an adequate ecological impact assessment of these operations. Here, we compared benthic macroinvertebrate communities sampled before and after a controlled sediment flushing operation in three different mesohabitats (a pool, a riffle and a step-pool) of an Alpine stream. Contrary from expectations, the composition of macroinvertebrate assemblages was not significantly different among mesohabitats. Moreover, the impact of sediment flushing was more significant in terms of density rather than in richness. Two stressor-specific indices were tested, but only one (the Siltation Index for LoTic EcoSystems – SILTES) clearly detected the impact of sediment flushing on the macroinvertebrate community

structure. Finally, some differences in the temporal trajectories and recovery times to pre-flushing conditions were observed among mesohabitats, both if the three mesohabitats were considered separately and if all their possible combinations were accounted for. Particularly, riffle was the most sensitive mesohabitat, not fully recovering one year after the sediment disturbance.

Auteurs du document : Alberto Doretto, Paolo Espa, Francesca Salmaso, Giuseppe Crosa, Silvia Quadroni

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