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Geomorphological monitoring of the clogging and unclogging of gravel-bed rivers substrate for the reintroduction of freshwater mussels (*Margaritifera margaritifera* and *Unio crassus*) in the Ardennes massif (Belgium)

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Well-oxygenated riverbed is essential for the proper ecological functioning of watercourses and the clogging of interstitial spaces by fine sediments considerably reduces the ecological quality of aquatic habitats. This phenomenon is linked to several parameters: the availability of fine sediments in catchments, soil erosion and land use, and the dynamics of the bed load. Within the framework of two European LIFE projects (LIFE19 NAT/BE/000093 and LIFE 19 NAT BE000054), which aim, among other things, to reintroduce endangered freshwater mussels (*Margaritifera margaritifera* and *Unio crassus*) into gravel-bed rivers of the Ardennes region, the clogging/unclogging extent of substrates and the sediment dynamics are monitored. Several monitoring devices were set up. Fine sediment traps were installed in the counter-slope of pools which is known to be a favourable habitat for mussels. This method makes it possible to quantify the amount of fine particles that can infiltrate the subsurface layer. Scour chains were placed on riffles to quantify the thickness of the active layer, which corresponds to the thickness of the bed that can be unclogged during floods. Grainsize surveys were also carried out on riffles to characterise the flow competence of rivers. Finally, the dynamics of the bed load was monitored thanks to pebbles marked with PIT-tags. At the end, these results alongside biomonitoring and physico-chemical data will enable the identification of the most appropriate sites for the reintroduction of freshwater mussels.