



Temporal dynamics of restored communities in ecological engineering works

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Among the numerous applications of ecological engineering are the creation of engineering structures made of living materials, of which objective is to perform a function (for instance, erosion mitigation). One distinctive characteristic of these living materials is that they have their own dynamics. Within a plant community constituting an engineering structure, diversity and species abundance may change. It is well-known that changes of the community structure can have a significant effect on the whole functioning, and the provided services. This is therefore of primary concern to determine if spontaneous dynamics of these engineering structures allows the preservation of expected services. Our questions are: (i) How vegetation develops on these structures? (ii) How community functional traits are changing with time? and (iii) Is sedimentation control expected service still efficient after 12 years. The study site is the Durance catchment on Jurassic black marls where erosion has led to bare gullies. Since 2002, about 2000 ecological engineering structures have been made up in order to control sedimentation. In spring 2014, we sampled 664 of on which vegetation was recorded on 1m² plot. Plant community traits were a community weighted mean calculated from 13 species representing >60% of overall abundances for which we had values related to erosion control. Sediment control markers were also measured on each structures. NMDS and RDA were used to determine the effect of age on plant communities, traits and sediment control. The results show that during the first years age does not have an effect on plant community dynamics, functional traits related to erosion or erosion control markers of engineering structures. From the fields, stochastic events (decanal floods, small land slides, etc.) seems to play a more major role.