

Detecting the imprints of past clear-cutting on riparian forest plant communities along a Mediterranean river

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Abstract

In riparian forests, clear-cutting causes long-lasting changes in both riparian and aquatic biota. In this work, we examined if past clear-cutting events occurred at different times have imprints on riparian forests in a Mediterranean river in central Italy. We carried out a randomized, plot-based vegetation survey of riparian forests in systematically sampled 500 m-long sectors along the whole river, dividing the riparian zone into two internal and two external strips. From historical aerial photos, past clear-cutting events within plots were detected and classified in age classes: i) cut in the past 8 years (recent); ii) cut between 8 and 19 years ago (intermediate); iii) no signs of clear-cutting in the last 19 years (distant). We analyzed the responses of vegetation to clear-cutting and strip position. Alien species richness increased and woody species richness decreased in recently clear-cut areas compared to those with a distant clear-cutting event. Moreover, recently cut woods showed an increase in alien and synanthropic species. Intermediate clear-cut areas had higher levels of invasion by alien species compared to areas with distant cut. Riparian forests of internal strips are impacted by clear-cutting, but seem to recover in 8-19 years thanks to their natural resilience. Conversely, recent or intermediate clear-cutting events did not affect any of the investigated vegetation attributes in the external strips since such forests were already invaded by *Robinia pseudoacacia* after human disturbance. Our results confirm that clear-cutting events can have long-lasting effects on Mediterranean riparian forests, confirming the vulnerability of river ecosystems to clear-cutting and suggesting the need for more caution in management practices to improve the conservation status of riparian forests.

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