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Bedload exports in a forest catchment following wildfire and terracing, north-central Portugal

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In Portugal, the occurrences of wildfires are frequently, on average, affects some 100.000 ha of rural lands each year, but in extreme years such as 2003 and 2005 the burnt areas can go over 300.000 ha. Studies in various parts of the world, including Portugal, have well-documented a strong and sometimes extreme response in overland flow generation and associated soil losses following wildfire. Over the last two decades, the construction of terraces in preparation of a new eucalypt plantation has become increasingly common in the mountain areas of north-central Portugal, including in recently burnt areas. Terraces are traditionally viewed as a soil conservation technique, however, the present authors have measured high splash and inter-rill erosion on recent terraces and have frequently observed gully formation connecting the terraces over the full hill slope length, as well as within the adjacent unsealed roads. The present study was carried out in a forest catchment in the north-central Portugal that was burnt by a wildfire during the summer of 2010 and logged and then terraced with a bulldozer during the winter 2010. The burnt catchment of roughly 25 ha was instrumented with two subsequent flumes with maximum discharge capacities of 120 and 1700 l sec-1. The bed load that deposited in the smallest flume was removed and weighted in the field at regular intervals during the subsequent three years. The records are being now analyzed, nonetheless preliminary results suggested that, besides the wildfire effects, also post-fire land management played an important role on bedload exports.