Geophysical Research Abstracts
Vol. 17, EGU2015-6313, 2015
EGU General Assembly 2015

Post-wildfire natural restoration of riparian vegetation under stable hydro-geomorphic conditions: Nahal Grar, Northern Negev Desert, Israel

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Wildfires are common to the Mediterranean region due to its defined dry season and long historical anthropogenic activities. Most of post-wildfire studies focus on mountains areas and thus refer to the hill-slope and its physical characteristics, e.g. morphology, length, angles, and aspect; its soil characteristics, e.g. type, infiltration rate, repellency; and its vegetative covers, e.g. planted trees vs. natural forest or native vs. exotic vegetation. In contrary there is very limited literature focusing on ecological and hydro-geomorphic aspects of post-wildfire of riparian vegetation / zone probably because of its negligible burned area relative to the spread of the fire, sometimes, over the whole watershed area. The limited literature on the topic is surprising given the fact that riparian vegetation zone has been acknowledged as a unique and important habitat supporting rich biodiversity. Herein we report on a wildfire event occurred on October 14th 2009 in a river section of Nahal Grar, Northern Negev Desert, Israel. The wildfire although was limited in its area (only 3 hectare) extended over the channel alone from bank to bank and thus provide a unique case study of completely burn down of riparian vegetation, mainly dense stands of Common Red (Australis Phragmites. Therefore a detailed study of this event provides an opportunity to tackle one of the basics questions which is determining the rate of natural restoration process that act at the immediate time after the wildfire event occurred. This type of information is most valuable to professional and stakeholders for better management of post-fire riparian zones. The results of the study suggest that under stable conditions, i.e. no major flood events occurred; disturbance time was short and ranged over 200 days due to, almost, immediate recovery of the riparian vegetation. However the re-growth of the riparian vegetation was not even but rather deferential and more complex then reported in the literature. In addition during that period no morphological changes were measured in the channel bed and banks; similarly no changes observed to base flow discharge though slight changes were measured to water pH probably due to the large quantities of ash on river bed.