High Park Fire: Key Lessons and What's Next?

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Abstract. The High Park Fire burned 350 km^2 west of Fort Collins in June 2012, and this was roughly seven times larger than the nearby 2002 Bobcat fire. In contrast to the Bobcat fire, the High Park Fire had tremendous impact on municipal water supplies in summer 2012 and 2013. The objectives of this presentation are to: 1) summarize the major observations with respect to post-fire runoff, erosion, and recovery; 2) compare the trends observed in the High Park fire to other recent wildfires; 3) identify the inherent difficulties and key lessons learned in measuring the hydrologic and geomorphic effects of wildfires; and 4) use our current understanding to project the short- and longer-term future with respect to wildfires and fire effects in the Colorado Front Range.

Overall, the High Park fire was not surprising compared to other fires in that: the pattern of burn severity was highly heterogeneous; post-fire infiltration rates dropped by roughly an order of magnitude to less than 10 mm hr^{-1} in areas burned at relatively high severity; post-fire peak flows and erosion rates were typically very localized due to the spatial variations in high-intensity rainstorms; by the third summer after burning hillslope erosion and downstream channel change had dropped by roughly an order of magnitude; and mulching did help reduce hillslope erosion rates. On the other hand, the High Park fire was unusual because: the expected post-fire channel change trajectory was substantially altered by the very large September 2013 rainstorm; there was a relatively high loss of all mulch types; and the amount of post-fire research initiated. My greatest surprise was the relative lack of geomorphic and ecological effects in the mainstem of the Cache la Poudre River. The key research lessons are actually lessons re-learned, namely: the difficulty of mobilizing people and equipment in time to measure the initial post-fire response; the underestimation of post-fire runoff and erosion rates; missed data cannot be retrieved; one generally should try to do a few things well than many things not well; and the relationships between independent and dependent variables depend largely on what measurements are made when and where.

What is next is relatively clear: future fires will increase in size and severity; we are not likely to be able to treat enough forest land to substantially alter future fire behavior except on a localized basis; in drier areas we will witness a state change in the amount of forest cover; and our infrastructure will be better prepared for the next fire than our research capabilities.