

Post-fire forest recovery in the framework of precision restoration: what to do and what not to do.

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Abstract

Post-fire forest management usually seeks to recover the original –or another kind of– forest. To accomplish this objective, it is common to use a very interventionist perspective, in which a high intensity of management and, often, the overwhelming use of technology and power measured in terms of heavy machinery prevail. During these activities, removal of burnt wood (salvage logging) is a common practice, which in the end may imply additional disturbances to the system. Moreover, a common end result is the massive planting of trees to generate a dense forest as quickly as possible. Here, I advocate for the use of a different perspective in which the main objective is to promote the natural dynamics of the ecosystem, reducing the cost and the impact of management while increasing its success and efficiency. This falls within what we proposed as “precision forest restoration”, a process in which the focus is to ensure that most of the seeds or seedlings used in the restoration can become adult trees by taking advantage of ecological processes. In the context of post-fire forest recovery, more attention should be paid to positive ecological interactions such as seed dispersal, negative plant interactions such as herbivory or seed predation, and the role of post-fire biological legacies (e.g., burnt wood) as elements that promote forest recovery by modifying the microclimate, providing essential nutrients in the long term, or protecting against herbivory. A post-fire precision forest restoration approach may use very low-technology approaches as well as cutting-edge advances such as a precise aerial drone seeding or even artificial intelligence, but, in any case, it should minimize further impacts in the ecosystem. In this regard, what we should not do is keep the current strategies of massive post-fire salvage logging, massive tree planting, or the construction of erosion barriers as they are currently done.

Keywords: post-fire salvage logging; forest restoration; precision restoration; compound disturbances

References

- Castro J. (2021). Post-fire restoration of Mediterranean pine forests. In: Pines and their mixed forest ecosystems in the Mediterranean Basin. Ne’eman G. y Osem Y. (eds.), pp. 537-565. Springer.
- Castro J, Morales-Rueda F, Navarro FB, Löf M, Vacchiano G, Alcaraz-Segura D (2021). Precision

restoration: a necessary approach to foster forest recovery in the 21st century. *Restoration Ecology* 29, e13421 (doi: 10.1111/rec.13421).

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