Title

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Journal

Restoration Ecology, 23(4)

ISSN

1061-2971

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Publication Date

2015-07-01

DOI

10.1111/rec.12249

Peer reviewed

Restoration Ecology
THE JOURNAL OF THE SOCIETY FOR ECOLOGICAL RESTORATION

RESPONSE ARTICLE

Passive restoration can be an effective strategy: a reply to Prach and del Moral (2015)

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We agree with Prach and del Moral that passive recovery is often a desirable and effective restoration strategy. Passive and various active restoration approaches need to be weighed on a case-by-case basis and depend on the goals, relative rates of recovery desired, and various social and financial costs implicit in each option. That said, we stress that passive restoration has a unique set of challenges and costs, which we highlighted in our original article and briefly reiterate here.

Key words: active restoration, natural regeneration, restoration costs

We appreciate Prach and del Moral's (2015, in press) thoughtful engagement with our opinion article about passive restoration (Zahawi et al. 2014), and hasten to note that we agree with their main point that passive recovery is the most desirable restoration approach in many cases. Although we highlighted some pertinent issues that are specific to passive restoration, we were not arguing generally against the use of this strategy. In fact, we noted in the first paragraph that "Worldwide, passive restoration accounts for much more habitat recovery than active restoration and it is projected to be a key mechanism for the persistence of biodiversity over the next century" (Zahawi et al. 2014). Although we focused the opinion piece on our research in Costa Rica, our broader experience of working on a range of restoration projects globally concurs with Prach and del Moral (2015, in press) that passive restoration should be the first approach considered and active restoration only undertaken if passive recovery does not meet the rate or target of recovery for a given project (Holl & Aide 2011). Indeed, there are many examples of former agricultural lands in the tropics that show rapid recovery of a diverse species assemblage without active intervention (e.g. Janzen 2002; Letcher & Chazdon 2009).

The main point of our article, which appears to have been misinterpreted, was to highlight the fact that there are overlooked costs (both direct and indirect) related to passive restoration that need to be factored in when selecting among restoration strategies. In many cases, passive restoration is considered or referred to as a "cost-free" option in the literature, and it is not without cost. Nor is it simply the same baseline cost that would be applied if we were enacting an active restoration strategy (e.g., fencing). There are also important social factors to consider that we outline in our article, which are not necessarily subjective, as they can lead to increased costs and even project failure. Many of the cost considerations we highlight are specific to the passive strategy, but they are not unique only to our case study. For example, we point out that passive restoration sites have a greater likelihood of being considered abandoned (Zahawi et al. 2014), a perception that is not restricted to Costa Rica, or even tropical America; problems can range from illegal usage by farmers (as in our case study) to invasions by land settlers. Lastly, we do emphasize in this article that passive restoration typically is the cheaper option—and not that it is so laden with costs that make it untenable as a strategy.

Meta-analyses comparing passive versus active restoration strategies show mixed results with some indicating that active restoration accelerates recovery (e.g., Curran et al. 2014; Meli et al. 2014) and others showing inconsistent effects (e.g., Kettenring & Adams 2011; Smucker & Detenbeck 2014). We agree with Prach and del Moral (2015, in press) that further meta-analyses comparing results of passive and different types of active restoration would be informative. Nonetheless, we contend that the selection of a restoration strategy will always be context specific and depend on project goals. For example, tree planting is commonly used to restore tropical forest, even if passive recovery is rapid because it meets land owners desires for economically valuable species. In turn, and as noted by Prach and del Moral (2015, in press), passive restoration may be more appropriate in cases where early successional habit is scarce. We close by reiterating that we were not intending to start a debate about the relative value of active versus passive restoration, but rather to note the complexity of both financial and social factors to be considered in weighing different restoration options.

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Author contributions: RAZ, JLR, KDH wrote and edited the manuscript.

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doi: 10.1111/rec.12249

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Coordinating Editor: Stephen Murphy

Received: 3 June, 2015; First decision: 5 June, 2015; Accepted: 5 June, 2015