

HONEY-ROSES, JORDI [S1-P2]

Assessing the Impact of Mixed-Use Protection on Forest Recovery and Reforestation

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The designation of mixed-use protected areas, such as buffer zones in Biosphere Reserves, are intended to allow forest dwelling communities to meet human needs while simultaneously protecting biodiversity and forest-related ecosystem services. Areas with mixed-use protection status have shown to be successful in maintaining forest cover intact, especially in Latin America (Nelson & Chomitz 2011).

However the impact of mixed-use protection on forest recovery and reforestation is less well understood. Areas of mixed-use are often the targets of active reforestation programs because they are more accessible and more degraded than areas with strict protection, or core zone designations. Mixed-use areas may also contain agricultural fields that are abandoned by farmers, which over time, return to forests due to natural succession.

In this paper, we examine the impact of mixed-use and strict protected status on forest recovery and reforestation in the Monarch Butterfly Biosphere Reserve, Mexico, with Landsat imagery from 1986 to 2012.

We apply principles in landscape ecology to distinguish secondary forests recovered by successional processes (forest recovery) from areas that were actively reforested by human intervention (reforestation). In this way, we identify two distinct mechanisms by which forest landscapes are restored. We then use matching methods to compare forest recovery and reforestation outcomes with similar control areas. We find that naïve estimates of impact show that mixed-use protection status leads to improved forest recovery and restoration, however these results differ when comparing more similar land parcels. In addition, by distinguishing natural forest recovery from active reforestation, we are also able to assess the cost-effectiveness of existing reforestation programs.

Few studies have examined the impact of protection status on forest recovery and restoration, and only one study in Costa Rica has applied matching methods to compare similar land parcels when assessing impact (Andam et al. 2013). We advance this work by (i) using a continuous measure of forest cover rather than a binary measure of forest/non-forest, and (ii) identifying mechanisms behind forest restoration, and (iii) ground our modeling and research design based on a clear theory of change.

As international leaders develop new deforestation reduction targets, our results will also highlight the importance of distinguishing net deforestation from gross deforestation (Brown & Zarin 2013).

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